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PROCEEDINGS OF THE SMART CITIES INTERNATIONAL CONFERENCE

8th Edition, 2020

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CUPRINS

Romania's position in the global value chains in comparison with European countries

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Abstract

The theoretical backgrounds of external fragmentation of production are resumed in the work paint main attention at the European countries and OECD experimental studies. In this paper, a contribution is made to better understand the insertion of Romania in the external fragmentation of production by using the wide range of WEB simulation tools of International Institutes. Several important findings emerge from this research. The economy of Romania has obtained significant advantages from participation in Global Value Chains. A list of indicates demonstrates grow in values in comparison with the pre-accession in EU period. The research shows that industries of Romania with the highest foreign value-added share in gross export are classified mainly in high R&D intensity industries (computer, electronic and optical products; publishing software), medium-high R&D intensity industries (IT & other information services; motor vehicles, trailers and semi-trailers). It was established that upgrading in industries took place when foreign value-added content increases as a result of the innovational activity. Another important observation was that the computer and optical equipment sector, IT and other informational services, as well as motor vehicles, are between sectors in which the employment, driven by foreign final demand, has essentially extended during the decade. At the same time, some less favorable tendencies can be observed. The study reveals that foreign value-added share of Romania's gross export is lower than average EU countries as well as the countries from the next EU enlargement that included in the analysis - Bulgaria, Hungary, Poland, and Estonia. It was revealed that Romania has insufficiently exploited the opportunities offered by the status of the EU member state to integrate into the value chains of European space. The results of the study can be used in the process of elaboration of adequate education, R&D, labour market and industrial and service sectors policies by decision-makers and the private sector of the country.

Keywords: *regional value chains, trade fragmentation, value-added terms, Romania.*

1. Introduction

Central and Eastern Europe has been connected to the large international networks of production through regional trade and investment agreements.

At present Europe is one of the most important hubs in complex GVC networks activity and main attention in this study will be painted in this region.

A number of empirical studies demonstrate the dynamic integration of the entire region of Central and Eastern Europe with the global economy, especially with the European Union. Grodzicki M.J. (2014) has summered that detailed case-studies demonstrate an ongoing industrial upgrading in the GVC the of Visegrad region [1]. If initially, their exports were based on commodities and natural resources and were focused mainly on assembly operations, in time more and more tasks of higher complexity are being fulfilled in the region [2, 3,4].

Capitalization of the EU member state status for Romania provides it with opportunities to deepen the penetration of their activities into the external fragmentation of production and, above all, the EU through the use of deep trade disciplines within the EU, some of which are beginning to address issues related to the work of the GVCs more directly.

The continuing growth of GVCs will define the global trade landscape of the 21st century. It will require from the countries to revise and adapt economic policy position at the macro and micro level on the one hand and their participation with other players in the net on others. This means closer economic integration of Romania with the EU by developing the ability of the state to be more attractive to cooperate with other members and to respond to their preferences and capabilities. The convergence of Romania with the EU through regional value chains will not only reduce the development gap of the country but also will accelerate the adoption of the principles of Western Europe performance levels by Romania.

A preliminary analysis of the position of Romania in GVC can be found in some recent country's studies [5, 6].

The issues of how Romania intended to benefit from global value chains and the associated benefits of upgrading in them are insufficiently studied. The present study aims to partially fill this gap.

The aims of the paper are to determine of engagement of Romania in GVC in comparison with other European countries based on the list of indicators, expressed in value-added terms; and to estimate the industry specialization of trade fragmentation of the country, as well as its predominant market concentration.

Besides its introductory part, the paper has four parts, including the theoretical and methodological background of research as well as all outlining the aspects external fragmentation of Romania, determining the place of Romania in GVC, and concluding remarks. The theoretical part of the study examines recent GVC features and is constructed in such a manner as to be useful in the explanation of experimental findings of research and formulation concluding remarks.

2.Theoretical background of research

Last decades in the economic literature dedicated to trade topics have discussed the importance of trade liberalization for fragmentation of production that consistently led to the appearance of global value chains (GVC).

In the economic literature increasing trade of big parts and components of manufacturing goods between countries has been variously called. Besides mentioned above, for a description of this globalization process has been used the following notions: vertical specialization, processing trade, slicing up the value-added chain, outsourcing, offshoring.

Although it is a consensus regarding that trade tariff reduction has stimulated trade exchange between countries that in line with the growth of the volume of international trade was expressed in the global fragmentation of production, the appearance of GVC is changing many aspects of economic and trade landscape. There are differences between GVC of the end of twenty century and the twenty-first century.

Recent economic literature focuses on vertical specialization patterns [7, 8, 9] and the ability to move to more value niches of GVC [10, 11], rather than leading of chain that it was at early debates dealing GVC. According to Yi, K. M. [12] vertical trade (between subsidiaries or at arm's length) explains most of the growth in world trade.

Baldwin R. [13] has made suggestion regarding the nature of "vertical specialization" and "horizontal" specialization of countries. If first mentioned one is based on skilled and unskilled labour wages gaps, the second mentioned on company-level excellence, rather than on wage gaps.

Appearance GVC was associated not only with essential and evident global economic and welfare benefits but with wage disparity, especially between developed and developing economies. It was observed by GVC economists that significant wage disparity between countries is not a constant value. The reduction in income dispersion between developing economies and the industrialized ones is named by Baldwin R. [13] one of the key features of the second unbundling. In turn, it justifies the dynamic character of contemporary GVC, their expansion by including new players in net, when wage disparity between existences reduced.

These observations elucidate the followings. The first, it explains the offshoring of labor-intensive stages from developed EU states to their neighboring low-wage countries. The second, why is before the second unbundling, trade in value chains was mainly among neighboring high-wage (on the company-level excellence), such as Western Europe and in present is still very high.

Dynamic character, big variety, as well as complication of the production, are characteristic features of contemporary GVCs. They are accompanied by changes in the location of production in framework GVC that leads to the opening of some new locations, while others appeared less profitable.

According to Ahmad, N. [14] GVC "is driven by technology, costs, access to resources and markets, and by policy reform". Trade and transport tariff reduction as well as IT dissemination allowed further international division of labor and specialization by countries, transferring competition from the firms to their

departments and individual jobs through participation in global value chains. So, global trade can be considerate as one of the major generator of employment. However, its effect varies considerably across regions/sectors and persons with different skill levels. Baldwin R. argued that the globalization opened new opportunities for rising productivity of EU's firms[15]. It has important implications for competitiveness Strategy of EU the same because the study approved that the second wave of globalization is favorable for high skill sectors/workers in Europe and vice versa.

In economic literature is noted on the regional character of contemporary GVC trade that became more concentrated among major regional trading partners [13, 16]. Li, X., Meng, B., & Wang, Z. indicated that they still remain largely regional, despite on penetration the patterns from Asia in main hubs of GVC[17].

Many studies have noted that one of the undeniable features of modern economic development is that services play an important and growing role in present GVC activity. GVC activity in manufacturing reveals that a large fraction of the value-added is created in services. Services often are important inputs (such as research, design) in the production process as well as link the different stages (such as marketing and distribution) of value chains of manufacturing goods [18, 19].

Elms, D.K. & Low, P. summarized that regional value chains and a focus on services can provide more global participation in the future, but government policies are needed to get it inclusive not only for developed but developing countries the same[7].

Besides the works that are explaining trade fragmentation, economic literature pain attention to its measurement. Traditional trading indicators (gross export / import, trade balance and their trends) are limited to explain the external fragmentation of production.

Models of specialization of external fragmentation in different countries are much more visible and clearly expressed when looking through complex value-added chains. Through them, it can find out with much greater accuracy what influences the creation of value added across countries, in which sectors employment is created, what are the differences between flows expressed in gross and value-added terms, etc. in a wide variety places of developed and developing countries in GVC.

Many studies note that trade in intermediate goods between countries is a suitable indicator for measurement of trade fragmentation because of trends in their trade show the formation GVC [20, 21, 22, 23].

Also in the economic literature is mentioned that analysis of the new global trade landscape is suffering from lacking appropriate models and good data and is difficult to interpret [24].

Recent OECD studies are based on the approach to the measurement of GVC participation, elaborated at the synthesis of the number of experimental research. According to this "value chain participation is defined in terms of the origin of the value added embodied in exports both looking backward and forward from a reference country: backward when it comes to foreign value added embodied in

exports, and forward when it refers to domestic value added which is used as inputs to produce exports in the destination country" (Kowalski, P. et al.,2015, p.13).

Some aspects of applied this approach are explained in the next sections in the determination of insertion of Romania in external fragmentation of production.

3.Methodological background and objectives of research

The methodological base of study is a wide range of WEB simulation tools of International institutes that allow estimating the engagement of Romania in external fragmentation of production and the best ways it can be done, among which are: Trade in Value Added (TiVA) instrument (edition 2018) derived through the construction of a global input-output table, and Trade in employment database (edition 2019), developed by OECD for the comparative analysis of GVC integration across countries of different levels of development.

TiVA database incorporates important information regarding the trade in goods by the end-use categories. It offers the information dealing with participation in GVCs via a foreign and domestic value-added share in gross export etc. Trade statistics included in the TiVA database is available for Romania.

For the analysis of information incorporated in the TiVA database will be used the International Standard Industrial Classification of All Economic Activities ISIC Rev. 4.

The classification of activities according to five groups (high, medium-high, medium, medium-low and low R&D intensive activities), elaborated by Galindo-Rueda, F., & Verger, F. [26] will be used **in the study the same.**

4. Insertion of Romania in external fragmentation of production

4.1. Place of Romania in regional value chains

On the basis of the precedent considerations, the succeeding economical analysis can be derived.

Romania relies on average for 21.6 % on foreign inputs and 78.4% on domestic produced inputs for her exports according to the latest data for 2016, included in TiVA database (Figure 1).

Foreign content of Romania's export was positioned higher than average EU value in 2006, but it reversed in 2016 and has tended to decline, dropping 5.7 percent during the decade.

With exception of Romania, countries of the next EU enlargement from analysis are positioned higher than average EU value in 2016 on the foreign content of export.

Foreign content of Hungary's export has reached the highest records between countries analyzed (44.1%) in 2016 and hasn't drastic fluctuation during the decade.

Bulgaria, Hungary, Poland, and Estonia have profited from vertical specialization in GVC as a result of the adjustment of economic policies in the process of entering and adhering to the EU.

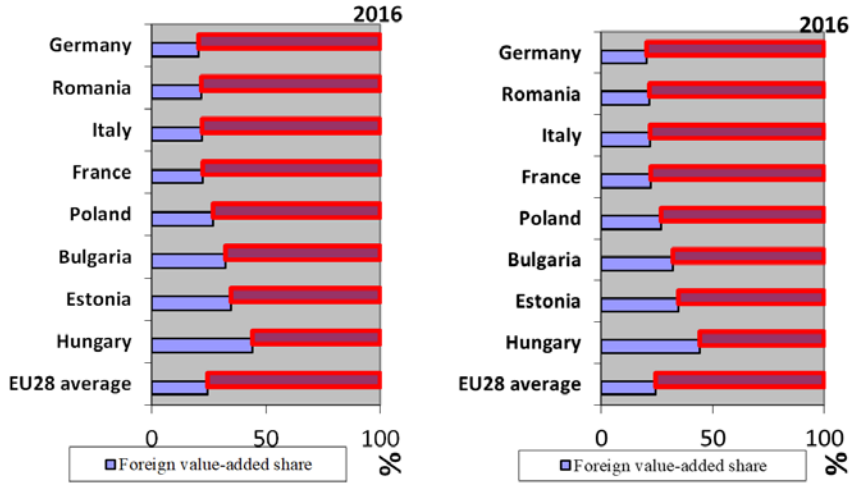

Fig. 1. Foreign and Domestic value-added share in gross export, selected EU countries, %
Source: Elaborated by the author at the TiVA database, edition December 2018

In the case of Romania, ranking higher on the domestic value-added content is presupposed that country more engaging in the export of upstream primary products, goods, and services than other countries from the next EU enlargement.

The oldest members of the EU have significant shares of domestic value-added content with little fluctuations during decade. This reflects their possibility of obtaining an extensive list of intermediate goods and services from domestic supplies and their offering for export. It is well known that countries with advanced technologies, such as Germany, are increasingly paying attention to sophisticate components that are exported for assembly elsewhere. When it comes to textiles Italy is the heart of 'Factory Europe'.

In plus, it is reflecting their positions at the initial (R&D) and the final stage (end-product sale) in those value chains. These places correspond to the highest share value added to the product.

It should be mentioned that 40.5% of the total Romanian import of intermediate manufacturing goods was used in export in 2016; it is lower with ten points than EU average (50.5%) (Figure2).

The figure reveals the textiles, wearing apparel, leather (46%) and wood and products of wood cork (34,5%)are close to the EU average regarding shares of intermediate imports embodied in Romanian exports.

It can be observed also that gap between Romania and the EU average level is more significant for transport equipment (about 16 points) and food, beverages and tobacco (more than 13 points).

The analysis above can be complemented by the outsourcing of service activity that is considered as the main part of the manufacturing export in the contemporary world. The contribution made by services activities to exporting activities of manufacturing can be estimated between 25% and 35% (Figure 3).

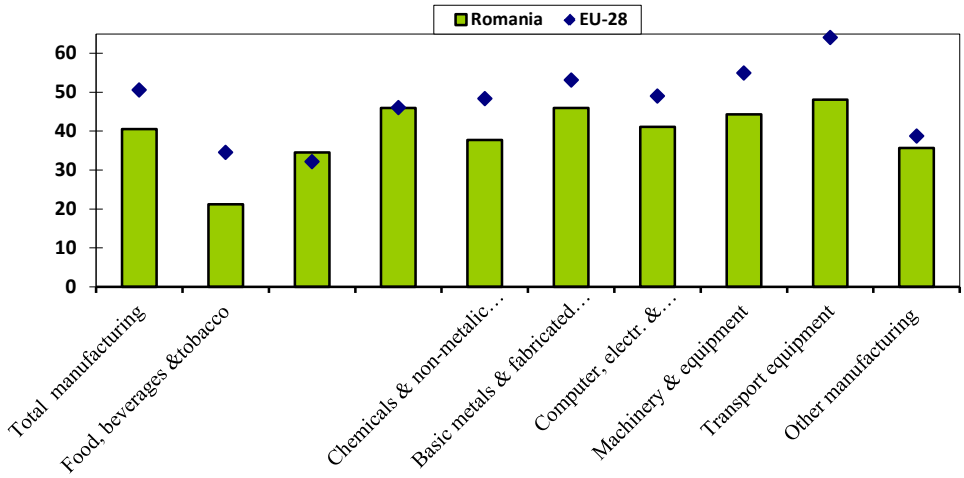

Fig. 2. Reexported manufacturing intermediate import as % of intermediate import, 2016
Source: Elaborated by the author at the TiVA database, edition December 2018

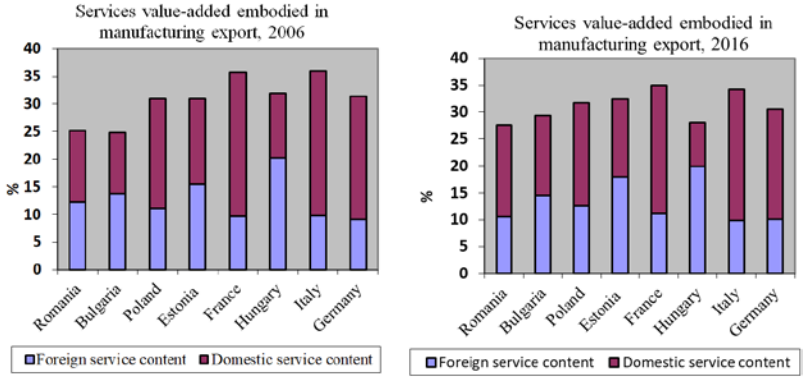

Fig. 3. Services value-added embodied in gross manufacturing exports, %
Source: Elaborated by the author at the TiVA database, edition December 2018

By the countries, the shares ranked from France (35%) and Italy (34.2%) at the upper end to Hungary (28.1%) and Romania (27.6%) at the lower end, according to 2016.

It can be observed that for France, Italy, Germany, Poland, Bulgaria, and Romania the domestic share of services value added is greater than the foreign one. At the same time, the domestic share of services value added is higher for France, Italy, and Germany in comparison with countries of the next EU enlargement mentioned.

Between countries, the foreign share of services value added is larger than the domestic one only for Estonia and Hungary.

In the case of Romania, service value added content contributed to 27.6% of manufacturing in 2016, up from 25.1% a decade earlier. At the same time, the domestic share of service content has extended to 4.2 percent points in 2016 in comparison until the accession period in the EU.

Important domestic outcomes of the countries were reached thanks to foreign final demand.

Industry 'export orientation' has increased for all EU countries from analysis during the decade and exceeds an average EU value reached (Figure 4).

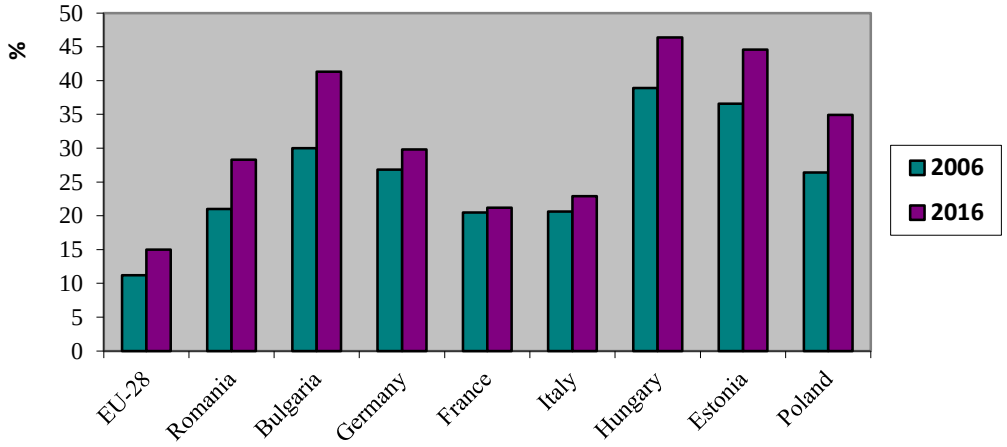

Fig. 4. Share of domestic value added embodied in foreign final demand in selected EU countries, as a percent of value added by industry

Source: Elaborated by the author at the TiVA database, edition December 2018

In 2016, by the countries, the shares ranged from Hungary (46.4%) and Estonia (44.6%) at the highest end to France (21.2%) and Italy (22.9%) at the lowest end.

In general, 28.3% of Romania's domestic value added in 2016 was driven by foreign final demand in comparison with 21.3% in 2006, until joining to EU.

Employment driven by foreign final demand increased between 2005 and 2015 in all analyzed countries (Figure 5).

In 2015 employment driven demand can be estimated between 20% and 40% regarding countries, and the hugest similar records were achieved in Bulgaria (42.5%), Estonia (42 %) and Hungary (41.8%).

In overall, 28.7% of employment in Romania was sustained by consumers in foreign markets in 2015. Between 2005 and 2015 it was significantly raised - at 5.6 percent points.

At the same time, it is one of the lowest records between the countries of the next EU enlargement included in analyzing. In 2015 in comparison 2005, employment driven by foreign final demand has extended in Bulgaria at -13percent points, Poland - 7.3, and Hungary -7.1.

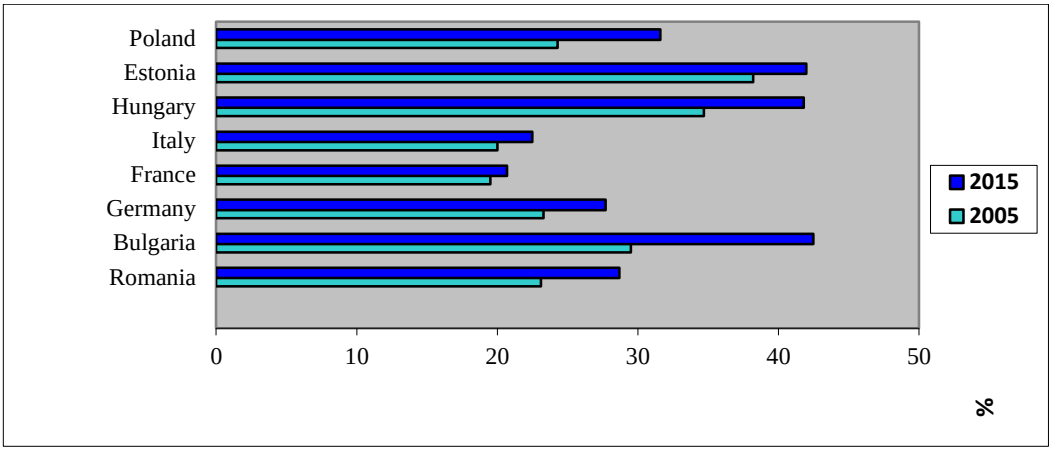

Fig. 5. Share of domestic employment embodied in foreign final demand in selected EU countries, as a percentage of total employment
Source: Elaborated by the author at the Trade in employment database, edition 2019

4.2. Particularities of industry specialization of trade fragmentation in Romania

Previous analysis indicated that Romania is more engaged in the export of upstream products and services in GVC than other countriesof the next EU enlargement.

Country's activities towards the beginning of value chains are presented in Figure 6.

For the following analysis have been selected industries with significant domestic value content of gross export.

To be mentioned that services tend to have higher domestic value-added content in their export (84.6%) in comparison with manufacturing (72.6%) in 2016 (Figure 6).

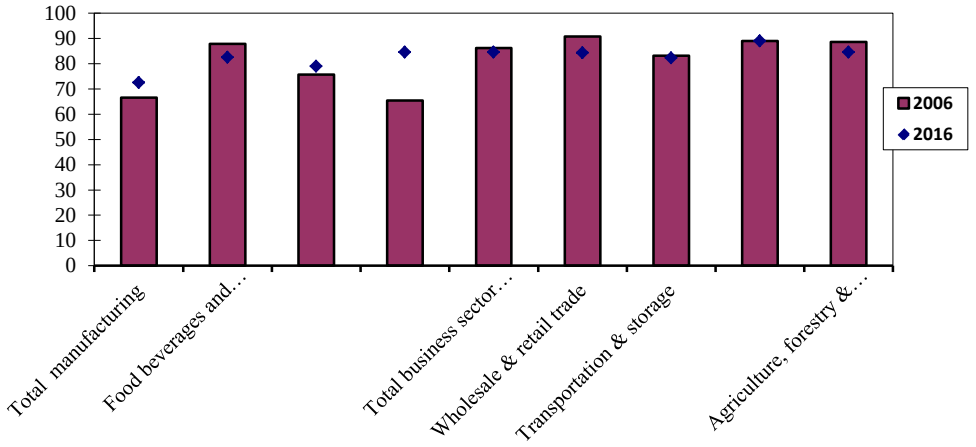

Fig. 6. Industries of Romania with the highest domestic value-added share in gross export, % *Source: Elaborated by the author at the TiVA database, edition December 2018*

For the following analysis have been selected industries with significant domestic value content of gross export.

To be mentioned that services tend to have higher domestic value-added content in their export (84.6%) in comparison with manufacturing (72.6%) in 2016.

In manufacturing, the textiles, wearing apparel, leather industry expanded significantly, at 19.2 percent points in 2016 in comparison until the accession period in the EU.

It can be observed that Romania mainly specializes in middle-low R&D intensity industries (food beverages and tobacco; wood and products of wood cork; textiles, wearing apparel, leather) and low R&D intensity industries (agriculture, forestry, and fishing; wholesale and retail trade; transportation & storage) in upstream products and service activities in GVC.

It is in contrast with the industries of Romania with the highest foreign value-added share in gross export (Figure 7).

It should be mentioned that industries of Romania with the highest foreign value-added share are classified in high R&D intensity industries (computer, electronic and optical products; publishing software), medium-high R&D intensity industries (IT & other information services; motor vehicles, trailers and semi-trailers) and medium R&D intensity industries (rubber and plastic products etc).

It can be observed the same that share of manufacturing with foreign value-added about in twice more that services ones. In turn, foreign value-added of services is presented by ICT, which developed with the significant fluctuations during analyzed period.

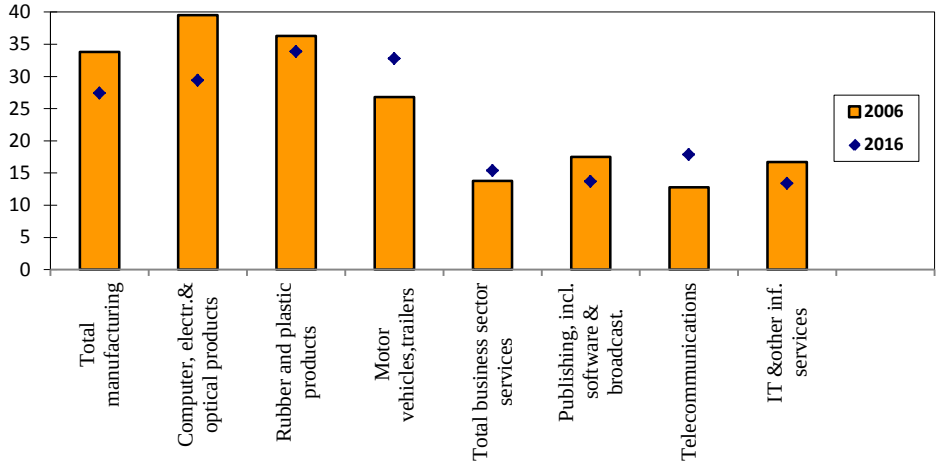

Fig. 7. Industries of Romania with the highest foreign value-added share in gross export, %
Source: Elaborated by the author at the TiVA database, edition December 2018

It can be observed the same that share of manufacturing with foreign value-added about in twice more that services ones. In turn, foreign value-added of services is presented by ICT, which developed with the significant fluctuations during analyzed period.

In this context, an upgrading strategy of Romania in GVC should presuppose investment in ICT and other high R&D intensity industries and activities with the scope of fostering a higher foreign content of export and replacing the lower domestic margin of value content by the higher one.

Participation of Romania in GVC has had an important influence on the employment at the country's labor market in general. It can be observed that engagement of Romania in GVC was more significant for employment in manufacturing than the service sector. So, in overall, 52.3% of employment in manufacturing and 33.8% in business sector services of the country were sustained by consumers in foreign markets in 2015(Figure 8, Figure 9).

At the same time, employment driven by foreign final demand decreased between 2005 and 2015 at 2.2 percent points in manufacturing, in contrast to the service sector.

Figure 8 also reveals that the decrease in 2015 in manufacturing driven by foreign final demand was determined by its the essential reduction in textiles, wearing apparel, leather – at more than 20 percent points; and electrical equipment- 12.5

A decade earlier in both mentioned sectors were reached the highest levels of employment sustained by consumers in foreign markets - more than 75% of the total industry employment.

Also, it can be observed that employment driven by foreign final demand has extended between 2005 and 2015 in motor vehicles – at 19.8 percent points, rubber and plastic products sector - at 12.2, other transport equipment -10.7 and computer and optical equipment -9.7.

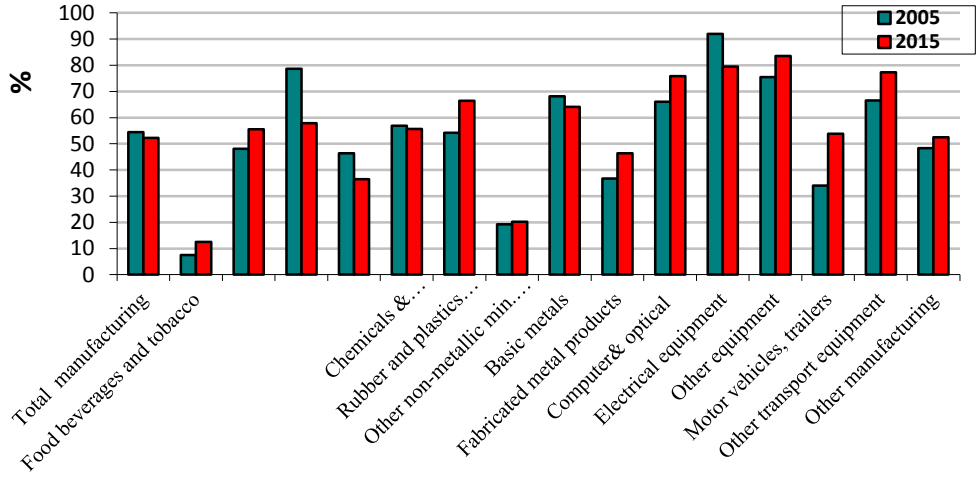

Fig. 8. Share of domestic employment embodied in foreign final demand by manufacturing, as a percentage of total industry employment

Source: Elaborated by the author at the Trade in employment database, edition 2019

There weren't the business sector services, in which employment embodied in foreign final demand was reduced for a decade (Figure 9).

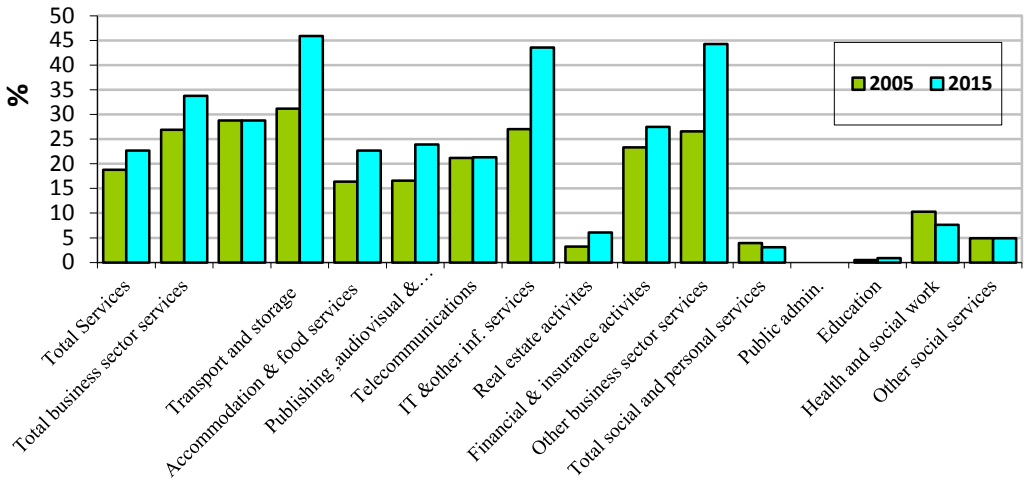

Fig. 9. Share of domestic employment embodied in foreign final demand by services, as a percentage of total industry employment
Source: Elaborated by the author at the Trade in employment database, edition 2019

If employment in the total service sector, sustained by consumers in foreign markets, has reached in 2015 at 22.7%, in business sector services -33.8%, but in social and personal services only – 3.1%. There weren't the public administration and social security services that could be embodied in foreign final demand as well as almost educational services during the decade.

From chart 9 follows that in the service sector the employment, driven by foreign final demand, has essentially extended during the decade in other business sector services - at 17.7 percent points, IT and other informational services - at 16.6 and transport and storage – 14.7.

4.3. Particularities of market concentration for trade fragmentation of Romania

In 2015, Romania's largest trading partner in both value of export and value-added content was Germany, Italy, and France (Figure 10).

The share of Germany in value in Romania's gross exports was 19.8% followed by Italy (12.5%), France (6.8%) and Hungary (5.4%). In value-added content, again Germany (11.9%) is the main market of final demand of Romania's value-added exports, followed by France (9.4%), Italy (8.5%) and United States (6.7%).

In value-added terms, Romanian trade with Germany is driven by its manufacturing industries (electrical equipment, motor vehicles; rubber and plastic products) as well as with Italy (textiles, wearing apparel, and related products), but by the business sector services with France (transport and storage).

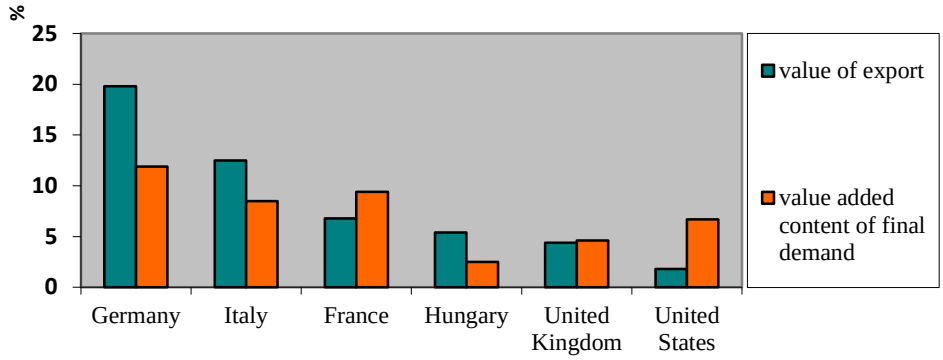

Fig. 10. Main export partners of Romania,as a % of gross export and domestic value added embodied in foreign final demand, 2015
Source: Elaborated by the author at the Market Analysis Tools ITC and TiVA database, edition December 2018

Regarding the imports, Germany tops the list of supplying markets for products imported by Romania with the share 19.8% in value of gross imports, followed by Italy (10.9%), Hungary (7.9%) and France (5.6%)(Figure 11).

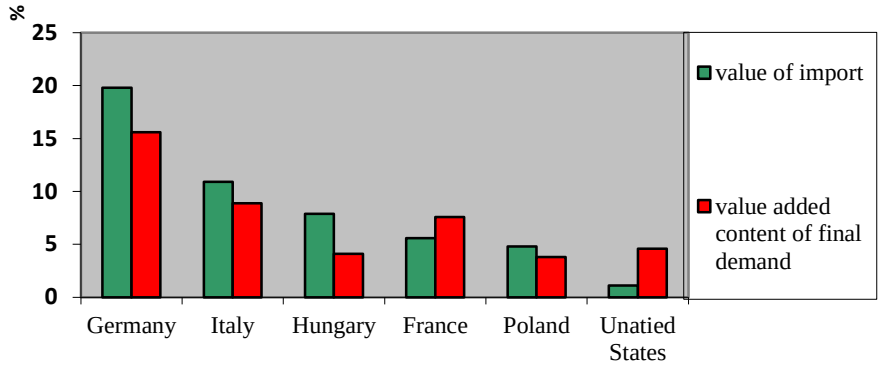

Fig. 11. Main import partners of Romania, as a % of gross import and foreign value added embodied in domestic final demand, 2015
Source: Elaborated by the author at the Market Analysis Tools ITC and TiVA database, edition December 2018

In value added content, among the top importers from Romania, are Germany (15.6%), Italy (8.9%), France (7.6%), and USA (4.6%).

It can be observed that the list of five main partners in the gross value is not matching with a list of principal countries of value-added content, in both export and import.

Figure 10 and Figure 11 also revealed that the USA is one of an important destination of value-added exports and source of value-added imports of Romania. At the same time, the USA is not between the largest trading partners of Romania in gross values.

By the domestic value-added, that comes back to Romania with manufacturing import can be measured the extent of bilateral production relations in regional value chains(Figure12).

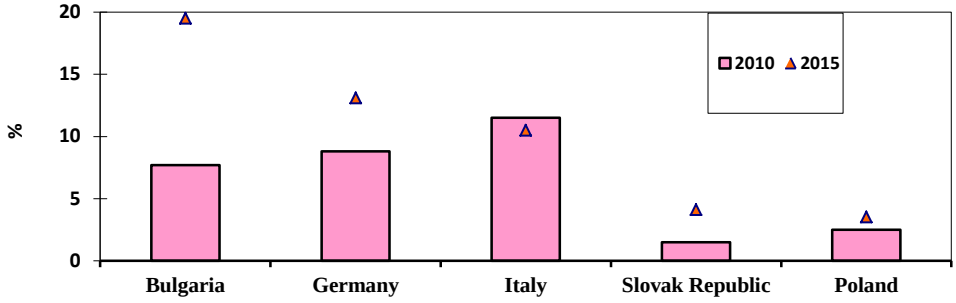

Fig. 12. Domestic value-added content of manufactured imports into Romania, main partners, *as a share of Romania's total value added embodied in imports*

In 2015, Bulgaria with 19.5 percent points was in the top partner's shares of total domestic value-added content of manufactured imports that return into Romania, followed by Germany - 13.1 and Italy -10 (Figure12).

It can be observed, that this indicator was in increasing in 2015 in comparison 2010 in all top partners with exception of Italy.

5. Conclusions

Several important findings emerge from this research.

The economy of Romania has obtained significant advantages from participation in GVC. The list of indicators demonstrates growth in values in 2016 in comparison with the pre-accession in the EU period. In this context, it should be mentioned that 28.3% of Romania's domestic value added in 2016 was driven by foreign final demand in contrast with 21.3% in 2006, until joining to EU. The service value added content contributed to 27.6% of manufacturing in 2016, up from 25.1% a decade earlier. Between 2005 and 2015 employment sustained by consumers in foreign markets was raised significantly - at 5.6 percent points.

At the same time, some less favorable tendencies can be observed.

The study reveals that foreign value-added share of Romania's gross export is lower than average EU countries as well as the countries from the next EU enlargement that included in the analysis - Bulgaria, Hungary, Poland, and Estonia. Because of foreign value-added content of gross export is one of the main indicators of GVC integration, it can be concluded than Romania is worse than EU countries on

average inserted in these value chains. In plus, Bulgaria, Hungary, Poland, and Estonia are more vertically specialized in GVC, as a result of adjustment of economic policies in the process of entering and adhering in the EU, than Romania.

Taking into attention that between 2006 and 2016 foreign content of Romania's export has tended to decline, the country did not deepen in external fragmentation of production for a decade.

It was revealed that industries of Romania with the highest foreign value-added share are classified mainly in high R&D intensity industries (computer, electronic and optical products; publishing software), medium-high R&D intensity industries (IT & other information services; motor vehicles, trailers and semi-trailers). It was established that an upgrading in industries took place when foreign value-added content increases as result of innovational activity.

In addition to this, another important observation should be mentioned.

The computer and optical equipment sector, IT and other informational services, as well as motor vehicles, are between sectors in which the employment, driven by foreign final demand, has essentially extended during the decade.

At the same time Romania relies on average at 78.4% on domestic produced inputs for her exports (2016). The analysis shows that in upstream oriented activities in GVC, Romania mainly specializes in middle-low R&D intensity industries (food beverages and tobacco; wood and products of wood cork; textiles, wearing apparel, leather) and low R&D intensity industries (agriculture, forestry, and fishing; wholesale and retail trade; transportation & storage). Also, it was observed that in employment in textiles, wearing apparel and leather, sustained by consumers in foreign markets was dramatically reduced for a decade – at 20.8 percent points. The last is explained by the fact that one of the globally integrated sectors of GVC - the apparel industry has undergone a major restructuring in recent years, primarily as a result of the phasing out of the WTO quota regime in 2005 and also due to the economic downturn in major markets that affected the reduction in the number of players (suppliers) of the chain.

All mentioned above are in contrast with the industries of Romania with the highest foreign value-added share in gross export.

In this context, the upgrading strategy of Romania in GVC should be implemented that presupposes adequate education, R&D, labour market and industrial and service sectors policies as well as investment in ICT and other high R&D intensity industries and activities.

It is also necessary to identify strategic segments for the modernization of industries, as well as to determine the necessary actions to improve the position of relevant products and services in regional value chains.

Market concentration of trade fragmentation of Romania is predetermined by long-standing historical and commercial relations.

Germany is Romania's largest export partner, followed by Italy and France. In value-added content, again Germany is the main market of final demand of Romania's value-added exports, followed by France, Italy and the USA. It is attracted attention that, the shares of Germany and Italy in value in Romania's gross exports are larger, but France and Italy are fewer than in value-added flows. It suggests that

Romania's value- added is entering in the France and USA through exports to neighboring countries (Bulgaria, Germany, and Italy), with which Romania has the highest degree of integration into regional value chains.

Similarly, regarding the imports, value-added content is arriving in Romania from France and the USA indirectly through third countries.

Based on the findings available from the database can be established that Romania's market is not the same important for three of its main partners (Germany, Italy, and France) in both gross and value-added content of export/import as for Romania. The last observation regarding the profile of Romania in GVC is although the economy of country undoubtedly won from integration in GVC, the gains obtained are not so significant as in the cases of other EU countries. The study reveals that countries from the next EU enlargement (Bulgaria, Hungary, Estonia, and Poland) have reached more significant outcomes thanks to foreign final demand in the indicators of domestic value added and employment, as well as the contribution of service value added to manufacturing than Romania. Reexported intermediate manufacturing imports of Romania are at 10 points less competitive than the EU average, by 13 points than in Bulgaria, and by 26 points than in Hungary.

For a decade, Romania is not sufficiently used the advantages offered by EU membership to be closely connected to Europe, one of the main manufacturing hubs around which GVC's activities are organized.

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Utilizarea Şase Sigma (6σ) în administraţia publică

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Abstract

În prezent sistemul administrativ românesc trece printr-o criză fără precedent odată cu răspândirea la nivel global al coronavirusului Sars-CovII, moment pentru care instituţiile publice nu au fost pregătite să asigure cererile şi nevoile tuturor cetăţenilor. În ciuda faptului că o parte dintre serviciile publice pot fi solicitate prin intermediul platformelor online ale instituţiilor (fapt benefic pentru perioada stării urgenţă în care programul cu publicul a fost închis), nu toţi cetăţenii au acces la internet.

În cadrul acestei lucrări îmi propun să analizez modul în care utilizarea metodei Six Sigma (6σ) şi a instrumentelor sale în cadrul administraţiei publice poate eficientiza procesul administrativ în ceea ce priveşte înregistrarea şi rezolvarea cererilor cetăţenilor în contextul imposibilităţii deplasării acestora la sediul instituţiei şi a utilizării unei platforme online.

Astfel, cu ajutorul Şase Sigma poate fi implementată o strategie de pregătire a instituţiilor publice pentru situaţiile de criză prin instruirea funcţionarilor publici pentru o mai bună gestionare a cererilor şi problemelor cetăţenilor (atât la nivel online, cât şi la ghişeu).

Cuvinte cheie: *Şase Sigma, administraţie publică, eficienţă, proces, strategie.*

1. Introducere. Utilizarea Şase Sigma (6σ) în administraţia publică

Având în vedere criza prin care trece sistemul administrativ românesc în prezent, în contextul pandemiei de coronavirus, care a îngheţat sistemul birocratic şi a dus la nemulţumirea constantă a cetăţenilor privind serviciile administraţiei locale, identificarea celei mai bune strategii de optimizare a procesului administrativ este crucială.

În cadrul acestei lucrări îmi propun să analizez modul în care utilizarea metodei Six Sigma (6σ) în cadrul administraţiei publice poate eficientiza procesul administrativ în ceea ce priveşte înregistrarea şi rezolvarea cererilor cetăţenilor în

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contextul imposibilității deplasării acestora la sediul instituției și a utilizării unei platforme online.

Prin urmare, sistemul administrativ românesc trebuie să fie pregătit pentru a face față viitoarelor crize de genul celei prin care trecem în prezent astfel încât toți cetățenii să poată beneficia de serviciile publice de bază. Acest lucru va fi posibil doar prin implementarea celei mai bune strategii de organizare a funcționarilor publici, de evaluare a problemelor generate de criză și de identificarea și aplicarea celei mai bune soluții, elemente pe care le regăsim în cadrul Six Sigma.

Mai înainte de toate trebuie să privim în ansamblu asupra metodei Șase Sigma, a beneficiilor utilizării acesteia și a instrumentelor și principiilor sale de bază.

2. Six Sigma: apariție, elemente

Six Sigma (Șase Sigma sau 6σ) reprezintă pe de o parte *o metodologie utilizată pentru îmbunătățirea unui proces*, iar pe de altă parte *un concept statistic prin intermediul căruia este definită și redusă variația inerentă ce apare în cadrul procesului și duce la oportunități de eroare, riscuri și defecte ale produsului finit și o satisfacție slabă a clienților (Six Sigma, 2018)*.

Metoda Șase Sigma poate fi utilizată în orice domeniu de către organizații, echipe și managerii de proiect pentru a reduce costurile realizării și implementării unui proces/proiect și variațiile ce duc la defecte și a implementa strategii bazate pe măsurători și valori privind abilitățile, experiența și cunoștințele acestora în vederea maximizării satisfacției beneficiarilor acestora (Six Sigma, 2018).

Din punct de vedere tehnic, Șase Sigma provine din relația dintre variația unui proces și cerințele clienților, distribuție (Figura 1) în care cea mai mare concentrație a valorilor se situează în jurul valorii medii și se reduce simetric, iar distanța dintre linia centrală și punctul de inflexiune (în care curba începe să se aplatizeze) este cunoscută sub numele de sigma (σ) (Michael George, 2003).

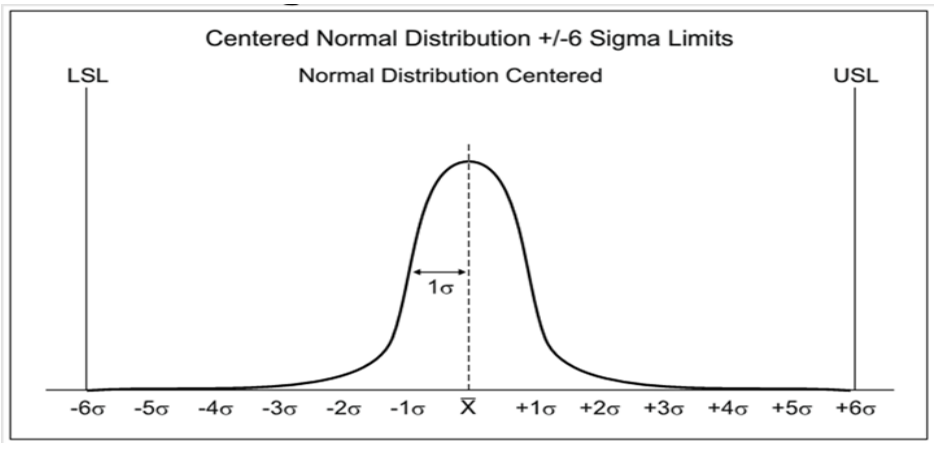


Fig 1. Distribuția normală 6 Sigma
Sursa: Michael L. George, Lean Six Sigma for Service. How to Use Lean Speed and Six Sigma Quality to Improve Services and Transactions, p. 25.

Cele şase numere σ reprezintă modul în care distribuţia producţiei reale se compară cu gama de valori acceptabile (specificaţiile clientului), iar defectul constă în orice valoare care nu se încadrează în specificaţiile clientului. Pe scurt, un proces este „capabil de Şase Sigma" dacă înregistrează un număr de 3,4 defecte pe milion de oportunităţi, în ciuda fluctuaţiilor (Michael George, 2003).

Tabelul 1 prezintă cele şase nivele ale Six Sigma în funcţie de numărul de defecte per milion de oportunităţi şi randamentul acestora.

Tabel 1. Nivelurile Şase Sigma

Nivelul Sigma	Defecte per milion de oportunităţi	Randament
6	3.4	99.9997%
5	233	99.977%
4	6,210	99.379%
3	66,807	93.32%
2	308,537	69.2%
1	690,000	31%

***Sursa**: Michael L. George, Lean Six Sigma for Service. How to Use Lean Speed and Six Sigma Quality to Improve Services and Transactions, p. 25*

Lăsând la o parte detaliile tehnice ale metodei, trebuie să ne concentrăm asupra elementelor care stau la baza Şase Sigma, întâlnite în cadrul oricărui domeniu de interes (nu doar tehnic, ci şi administrativ), şi anume:

- „*Conducerea* (CEO-ul în cazul companiilor private şi Directorul, Consilierul Şef în domeniul public) şi *managementul* (un set de acţionari care lucrează pentru un obiectiv comun folosind un set de resurse necesare pentru realizarea unui proces/proiect);
- *Alocarea resurselor umane şi de timp adecvate* necesare realizării şi implementării procesului/proiectului;
- *Alocarea nivelului necesar de pregătire pentru cei implicaţi* (realizarea de internship-uri, organizarea unor cursuri etc.) şi
- *Eliminarea variaţiei* (definirea metodei de soluţionare a problemelor şi a instrumentelor de susţinere necesare managementului pentru a lua decizii bazate pe date) (Michael George, 2003)."

Cu alte cuvinte, pentru a ne asigura că un proiect/proces este realizat corespunzător şi poate fi implementat cu succes trebuie să acordăm o atenţie deosebită asupra oamenilor implicaţi în ceea ce priveşte competenţele şi nivelul de pregătire al acestora.

Astfel, numai prin mobilizarea unei echipe competente, formate din specialişti în diverse domenii este posibilă implementarea eficientă a soluţiilor identificate şi asigurarea satisfacţiei beneficiarilor proiectului/procesului respectiv.

3. Lean Six Sigma- un model de îmbunătăţire a sistemului administrativ

În vederea aplicării metodei Şase Sigma în cadul administraţiei publice trebuie să ne concentrăm asupra conceptului **Lean Six Sigma**, o abordare axată pe

îmbunătățirea calității, reducerea variației și eliminarea deșeurilor dintr-o organizație (Jeffrey Fletcher, 2016).

Spre deosebire de Șase Sigma, Lean Six Sigma se axează asupra unor elemente de natură tehnologică privind eficiența și eficacitatea serviciilor publice, precum:

- „Organizarea electronică - eficiență și eficacitate a conducerii;
- Servicii electronice - eficiență în furnizarea de servicii;
- Parteneriatul electronic - eficiență în lucrul cu organizații publice și private și
- Democrația electronică - participarea cetățenilor la luarea deciziilor guvernamentale (Jeffrey Fletcher, 2016)."

Astfel prin aplicarea Lean Six Sigma în domeniul public este urmărită îmbunătățirea sistemului administrativ prin eliminarea birocrației excesive și trecerea realizării și înregistrării formularelor completate de către cetățeni pentru diverse servicii în mediul online.

Pe de o parte, această abordare aduce o serie de avantaje precum eliminarea timpului de așteptare a transmiterii cererilor (nemaifiind necesară deplasarea la sediul instituției) și rezolvarea mai rapidă a nevoilor mai multor cetățeni (înregistrarea unui număr mai mare de cereri în sistem decât prin introducerea în format electronic a documentelor fizice).

Pe de altă parte, cetățenii care nu au acces la internet nu pot beneficia de aceste servicii, fiind nedreptățiți în cazul închiderii programului cu publicul al instituțiilor și trecerea acestora în mediul online, situație întâlnită în contextul pandemiei de coronavirus. În acest caz, timpul de soluționare a cererilor cetățenilor este unul nedefinit, fapt ce duce la scăderea gradului de satisfacție și de încredere al acestora privind serviciile publice.

Cu alte cuvinte, atât Șase Sigma, cât și Lean Six Sigma reprezintă o strategie eficientă de îmbunătățire a serviciilor publice în vederea pregătirii funcționarilor publici pentru a gestiona situațiile de criză (pandemia de coronavirus și închiderea instituțiilor pentru o perioadă lungă de timp- starea de urgență de 3 luni de zile) și a asigura satisfacția cetățenilor.

Instrumentul de bază folosit de Lean Six Sigma pentru îmbunătățirea proceselor este **D.M.A.I.C. (Define, Measure, Analize, Improve, Control)** (Figura 2) în vederea rezolvării problemelor apărute în cadrul procesului/proiectului cu ajutorul a cinci faze distincte:

- „**D- Definire** → identificarea scopului și obiectivelor proiectului;
- **M- Măsurare** → evaluarea performanței curente;
- **A- Analiza** → identificarea problemelor și examinarea cauzei apariției acestora în cadrul procesului în vederea stabilirii celei mai bune soluții;
- **I- Îmbunătățire** → implementarea soluțiilor și identificarea unui mod de îmbunătățire a procesului pe termen lung în vederea evitării reapariției problemelor rezolvate;
- **C- Control** → monitorizarea procesului pe termen lung pentru a ține evidența evoluției acestuia și crearea unui plan de răspuns pentru rezolvarea problemelor viitoare (Jeffrey Fletcher, 2016)."

Fig. 2. D.M.A.I.C.

Astfel, prin utilizarea D.M.A.I.C. în cadrul administraţiei publice în contextul crizei actuale putem observa impactul pe care aceasta l-a avut asupra serviciilor publice din punct de vedere al gradului de pregătire a funcţionarilor publici de a gestiona situaţia şi a modului în care cetăţenii au beneficiat sau nu de serviciile de bază (solicitarea şi emiterea unor acte precum buletinul, paşaportul, obţinerea asigurărilor de sănătate etc.).

În continuare mă voi axa asupra elementelor de bază ale strategiei de pregătire a funcţionarilor publici şi a instituţiilor în situaţii de criză cu ajutorul Şase Sigma.

4. Cadrul de aplicare a Şase Sigma în administraţia publică

Întrucât Şase Sigma se axează asupra reducerii costurilor şi variaţiilor generate de o serie de defecte ale procesului pentru implementarea celor mai bune soluţii şi asigurarea gradului de satisfacţie al clienţilor (beneficiari ai produsului), utilizarea sa în cadrul administraţiei publice trebuie să surpindă principalele defecte care afectează sistemul administrativ şi scad nivelul de mulţumire şi încredere al cetăţenilor faţă de serviciile oferite de instituţiile publice. În cadrul administraţiei publice locale există o serie de defecte guvernamentale care afectează procesul de realizare şi implementare a proiectelor publice, printre care amintim: defecte de procesare, informaţionale, de muncă şi de energie umană- explicate în Tabelul 2 (Bernard Marr, James Creelman, 2011).

Tabel 2. Forme tipice de defecte guvernamentale

Tip de defecte	Zona (zonele) specifice
Defecte de procesare	Stabilirea unei strategii greşite care nu îndeplineşte standardele, produsul finit fiind unul nefiabil şi prezentând o serie de defecte
Defecte informaţionale	Traducerea greşită a informaţiilor, pierderea sau lipsa de informaţii, informaţii irelevante sau incomplete
Defecte de muncă	Procesarea greşită sau incompletă a informaţiilor
Defecte de energie umană	Lipsa de concentrare a funcţionarilor publici, aplicarea greşită a obiectivelor proiectului, controlul ineficient al defectelor de calitate şi utilizarea atribuţiilor necorespunzătoare

Sursa: *Bernard Marr, James Creelman, More with Less. Maximizing Value in the Public Sector*

Cu alte cuvinte, în vederea realizării unui proiect eficient şi eficace în spaţiul public, principalul obiectiv de acţiune este reducerea sau eliminarea acestor defecte şi asigurarea unei modalităţi de împiedicare a apariţiei unora noi pe termen lung după implementarea proiectului.

Aşadar, aria de aplicare a metodologiei Şase Sigma în cadrul administraţiei publice este Departamentul de Resurse Umane, iar strategia de pregătire a

instituţiilor publice pentru situaţiile de criză (precum cea prin care trecem în prezent de la răspândirea la nivel global a coronavirusului) urmăreşte instruirea funcţionarilor publici pentru o mai bună gestionare a cererilor şi problemelor cetăţenilor (atât la nivel online, cât şi la ghişeu).

Şase Sigma contribuie la sprijinirea instituţiilor prin facilitatea unei strategii de recrutare a personalului calificat şi pregătire a funcţionarilor publici pentru a integrarea fluxul de informaţii şi analiza datelor în vederea rezolvării cererilor cetăţenilor şi gestionarea problemelor apărute (Six Sigma, 2018).

În cadrul birourilor guvernamentale, implementarea acestei metode contribuie la creşterea eficienţei şi a eficacităţii serviciilor prin identificarea cauzelor care generează întârzierea realizării anumitor procese (modificarea unor taxe) ce duce la pierderi financiare şi de încredere a cetăţenilor (de exemplu o întârziere în executarea unei creşteri a taxelor de înmatriculare a automobilelor poate costa în final un oraş sau un judeţ milioane de euro) (Six Sigma, 2018).

Astfel, angajând oamenii cu pregătirea necesară în domeniu şi instruind personalul la standarde înalte, o instituţie poate asigura un grad de eficienţă şi eficacitate a serviciilor oferite şi poate menţine satisfacţia cetăţenilor şi evita pierderile financiare şi de încredere a acestora.

În acest sens, Şase Sigma utilizează un sistem de recunoaştere a pregătirii celor implicaţi în cadrul procesului numit **Black Belt Program**, aceştia fiind clasificaţi drept:

- „**Centuri Albastre (Blue Belts)**: persoane instruite în rezolvarea problemelor de bază şi coordonării echipei (nivelul minim necesar);
- **Centuri Galbene (Yellow Belts)**: persoane instruite pentru a colecta date, a participa la rezolvarea problemelor şi a ajuta la implementarea activităţilor de îmbunătăţire;
- **Centuri Verzi (Green Belts)**: persoanele care au finalizat pregătirea Six Sigma şi sunt capabile să ajute echipele de proiect şi să gestioneze proiecte simple Six Sigma;
- **Centuri Negre (Black Belts)**: persoane extrem de competente pentru a servi consultanţi şi instructori la faţa locului pentru aplicarea metodologiilor Six Sigma;
- **Maeştrii Centuri Negre (Master Black Belt)**: persoane capabilie să predea metodologia Six Sigma la toate nivelurile de personal şi să se ocupe de managementul executiv (Frank Voehl, James Harrington et al., 2014)".

Astfel, prin aplicarea acestui program al Şase Sigma în spaţiul public funcţionarii publici cu nivelul de debutant (Centurile Albastre) vor fi instruiţi de cei cu grad superior (Centrurile Negre) pentru a-i putea susţine în soluţionarea rapidă a problemelor care apar şi rezolvarea cererilor tuturor cetăţenilor (atât la ghişeu, cât şi pe platforma online a instituţiei).

În acest sens, în cazul reducerii drastice a numărului de funcţionari publici activi şi a închiderii instituţiilor şi trecerii serviciilor în mediul online, instituţia respectivă trebuie să asigure soluţionarea cererilor tuturor cetăţenilor (nu doar a celor care solicită serviciile publice cu ajutorul platformelor online, ci şi a celor care nu au acces la internet).

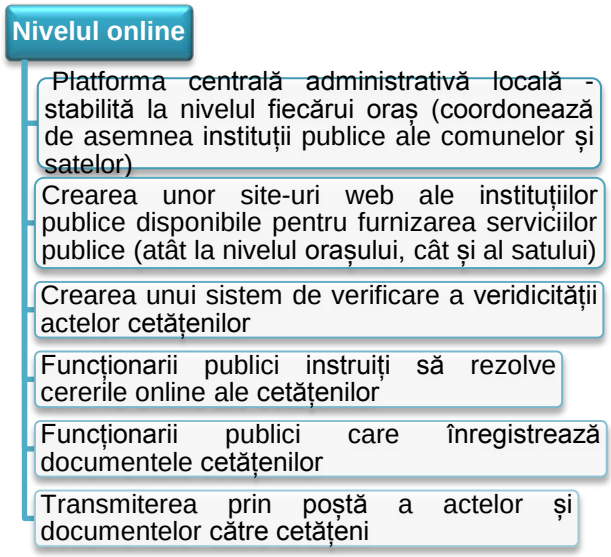
În continuare, o strategie de pregătire a instituţiilor publice pentru a gestiona situaţiile de criză şi a asigura satisfacerea cererilor şi nevoilor tuturor cetăţenilor utilizând metoda D.M.A.I.C. va avea următoarele elemente:

D	**Problema:** Lipsa de pregătire a sistemului public pentru situaţii de criză (precum pandemia actuală de coronavirus) **Obiectiv:** Identificarea unei modalităţi de garantare a serviciilor publice pentru toţi cetăţenii în situaţia imposibilităţii prezentării la sediul instituţiei
M	Evaluarea numărului de funcţionari publici din fiecare instituţie şi a nivelului lor de pregătire şi a gradului acestora Evaluarea numărului şi tipologiei de cereri ale cetăţenilor în cadrul unui interval de timp (zi, săptămână, lună)
A	**Problema identificată**: Imposibilitatea utilizării platformelor online ale instituţiilor de către toţi cetăţenii (cei care nu acces la internet acasă) **Soluţie:** Depunerea cererilor la sediul instituţiei de către cetăţenii care nu au acces la internet şi utilizarea platformei online de către ceilalţi.
I	Deschiderea unui ghişeu la intrarea instituţiilor pentru depunerea cererilor şi simplificarea modalităţii de completare a acestora pentru reducerea timpului petrecut de cetăţeni şi a birocraţiei excesive
C	Evaluarea numărului de cereri soluţionate în raport cu numărul de cereri depuse atât la nivelul instituţiei cât şi la nivelul platformelor online

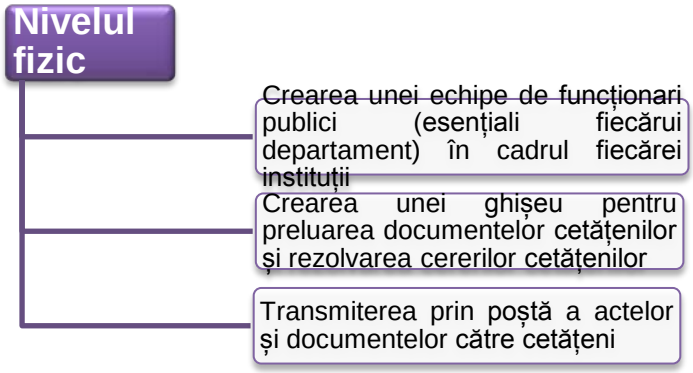
Astfel, cu ajutorul metodei Şase Sigma poate fi conturată **Strategia administrativă în situaţii de criză** ce vizează optimizarea sistemului administrativ românesc local (la nivelul fiecărei unităţi administrativ-teritoriale) pentru a face faţă unei crize, precum pandemia de coronavirus (moment care a afectat furnizarea serviciilor publice de bază către cetăţeni).

Această strategie urmăreşte crearea unor echipe de funcţionari publici bine pregătiţi pentru situaţii de criză în cadrul fiecărei instituţii publice, formată pe de o parte dintr-o echipă instruită pentru soluţionarea cererilor cetăţenilor la nivel online şi o echipă destinată serviciilor la ghişeu pentru cetăţenii care nu au acces la internet (situaţie des întâlnită în mediul rural).

Strategia administrativă în situaţii de criză cuprinde două elemente de bază, şi anume Nivelul online (dedicat furnizării serviciilor publice cetăţenilor, fără prezentarea acestora la sediul instituţiei) şi Nivelul fizic (dedicat cetăţenilor care nu au acces la internet), al căror elemente sunt explicate în cadrul graficelor de mai jos.



Grafic 1. Nivelul online



Grafic 2. Nivelul fizic

Totuşi, trebuie să ţinem cont de faptul că această strategie va fi aplicată numai în timpul perioadelor de criză, precum pandemia de coronavirus prin care trecem în prezent (moment în care cetăţenii sunt sfătuiţi să evite deplasările şi este posibilă închiderea programului cu publicul a instituţiilor publice) pentru a asigura egalitatea de drepturi a cetăţenilor în furnizarea serviciilor publice atât pentru cei care pot utiliza platformele online, cât şi pentru cei care nu au internet.

În concluzie, Şase Sigma, respectiv Lean Six Sigma reprezintă o serie de metode eficiente şi eficace de realizare şi implementare a unor strategii în spaţiul public privind instruirea unui personal calificat şi pregătit la standarde înalte pentru a soluţiona rapid orice problemă şi a gestiona cu uşurinţă situaţiile de criză ce pot apărea pe viitor.

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The importance of intelligent urbanism

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Abstract

Urbanism is ubiquitous in our lives. We live it every day, we perceive it whatever we undertake. We run into him when we go shopping, when we go to work, college, school or the park. We surround ourselves and carry out our activity surrounded by it. It is the everyday context and background. We often use a set of words that describe the feelings we have when we interact with places or cities. We say that we "like" city X, "love" area Y, or even "hate" or "hate" a house or a building. Thus, what we feel is determined by what we perceive: harmony, contrast, balance, dynamics, the elements that make the whole functional. Another criterion is the aesthetic sense and the representation of beauty (or why not, of the grotesque) in the eyes of the beholder, who absorbs. "Good" or "appropriate" urbanism is what encourages us to make these connections, to make our experiences not only pleasant, but also practical. Educated imagination is a key element. In parallel, mathematics, objective analysis and functional principles make us expand our range of possibilities for "perfecting" the framework in which we exist.

The beginning of the 21st century finds the urban universe at the confluences of the cultural, social, political and economic currents specific to this period of development and communication unprecedented in the history of humanity. The need to physically organize the functional units of the settlements is ingeniously solved from the dawn of civilization, there is undisputed archaeological evidence in this regard. Gradually, during the evolution, more and more elaborate structures appeared, meant to streamline and harmonize both the infrastructure and the constructions inside the localities. Although coagulated as a science for about a hundred years, a relatively short period compared to the millennial development of architecture - a complementary field, resonating in the cultural area -, it reveals an undeniable importance in the new landmarks of modern life.

Keywords: *urbanism, landscaping, urban infrastructure, smart city, transport.*

O întrebare esenţială, marcantă pentru secolul în care trăim şi care a stat la baza numeroaselor dezvoltări în domeniu, este: *cum putem dezvolta capacitatea de a cultiva idei pentru a face ca locurile să fie vii, iubite, utile şi eficiente, în raport cu*

resursele pe care le avem le dispoziţie. Plecând de la această întrebare, putem observa că mai ales în ultimul deceniu o atenţie deosebită a fost acordată oraşelor şi proiectelor de urbanizare. Acest demers nu a fost întâlnit doar la nivelul gândirii arhitecturale, urbanistice sau în cadrul cercurilor academice, ci la nivelul constructului social şi al politicilor publice. Toate aceste dezbateri ilustrează oraşele – din întreaga lume – ca centru de inovare, ca motorul principal de creştere economică şi ca o arenă esenţială pentru progresul social. Aceste argmente şi ideea că majoritatea populaţiei globale trăieşte în zone urbane au creat un slogan devenit celebru: „*secolul actual este un secol urban*".

Cu toate acestea, este recunoscut în marile cercuri ştiinţifice contemporane, că există încă aspecte urbane cu caracter şi impact negativ, cum ar fi sărăcia, inegalitatea, insecuritatea, vulnerabilităţile de mediu şi lipsa accesului la diferite tipuri de infrastructură. Acestea nu sunt numai probleme ale sectorului politic, natura lor interdisciplinară le face şi probleme ale urbanismului şi construcţiei sociale.

Ultimul deceniu a reprezentat şi cadrul de dezvoltare pentru o serie de politici de inovare a dezvoltării urbane, prin valorificarea capacităţilor oraşului şi prin abordarea problemelor şi nevoilor identificate. În conformitate cu abordările specifice regimul democratic şi al curentului liberal sau neoliberal, astfel de politici vizează adesea creşterea economică durabilă şi eficientizarea existenţei. Guvernul este privit ca facilitator al proceselor, iar sectorul privat devine un partener în procesul de finanţare şi execuţie al acestora. Este evident că sectorul politic este parte importantă a procesului de urbanizare, de dezvoltare urbană sau de implementare a direcţiilor viitoare.

De exemplu, un concept transferat în aria politicilor se axează pe „*Oraşul Creativ*", dar şi mai recent, pe creşterea şi dezvoltarea conceptului de politică „*Smart City*". Acest concept a fost prezentat şi discutat la nivel internaţional, regăsind forme specifice în numeroase cazuri: Tel Aviv, Cape Town, Songdo, Amsterdam şi Delhi. În cazul oraşului Tel Aviv, supranumit şi oraşul „Non Stop", politica sa Smart City „*implică în mod activ rezidenţii în experienţa urbană şi dezvoltarea urbană, accentuând în acelaşi timp angajamentul în procesul de luare a deciziilor şi înţelepciunea mulţimii ca mijloc de gestionare inteligentă a municipiului în epoca nouă (Tel Aviv)*". Din perspectiva acestuia, modelul de Smart City promovat implică „*un climat care să faciliteze formarea de colaborări între rezidenţi, unităţi de afaceri, organizaţii şi municipalitate, folosind tehnologii de ultimă generaţie care permit învăţarea, creativitatea şi împărtăşirea pentru a obţine prosperitate socială şi economică (Tel Aviv)*". În cazul oraşului Amsterdam, politica Smart City s-a numit „Amsterdam Smart City programme" (Amsterdam Smart City, 2007), iniţiativa fiind dezvoltată în 2007. Realizarea sa în practică s-a datorat colaborării dintre Amsterdam Innovation Motor (AIM), operatorul Liander şi administraţia municipală. Decizia lor de a transforma Amsterdamul într-un oraş inteligent a fost susţinută atât de sectorul politic, cât şi de o motivaţie clară: dorinţa de a utiliza noile tehnologii pentru a ajuta oraşul să-şi rezolve problemele de mediu şi să construiască un context urban sustenabil.

Având instrumente promițătoare pentru o guvernare eficientă prin intermediul tehnologiilor de ultimă oră, politicile Smart City răspund dorinței guvernelor de a îmbunătăți procesele de guvernare și de a îndeplini calitatea de „oraș de ultimă generație".

Ca domeniu academic *„urbanismul inteligent" este în curs de dezvoltare și analizează modul în care politicile Smart City funcționează în orașele contemporane. Mai mult decât atât, urbanismul inteligent consideră ca Smart City trebuie să reprezinte în primă instanță o soluție pentru problemele urgente urbane și să nu reprezinte un răspuns politic la conflictele politice care reflectă discursurile asupra problemelor urbane, a soluțiilor adecvate și a dezvoltării urbane.*

Având în vedere existența politicilor Smart City, nu putem să nu remarcăm modul în care domeniul arhitectural și urbanismul se „împletește" cu sectorul politic, un fapt consacrat în istoria umanității și a așezărilor.

În mod similar, ca parte semnificativă a planului urban, sistemele de transport au un impact direct și semnificativ asupra vieții cotidiene a tuturor rezidenților dintr-un oraș. Indiferent dacă persoana conduce sau nu, tipul de sistem de transport disponibil în jurul acestora determină alegerea pentru mersul pe jos, pentru opțiuni alternative (biciclete, trotinete), pentru transportul în comun sau pentru mașină personală. Acest context vizează și transportul intraurban, dar și cel interurban, precum și întreaga rețea de transport și infrastructura aferentă. Conform Cartei Urbanismului European *„urbanismul și amenjarare teritoriului integrate implică corelarea complexă a politicilor de transport și de amenajare a teritoriului*" (Carta *Urbanismului European*). Cu toate acestea, nu este nevoie de niciun document oficial sau manual ca să putem afirma ce experimentăm zi de zi: activitatea noastră se desfășoară în regim de dependență cu aceste elemente ale urbanismului și ale sistemului de transport. Indiferent de ce alegere facem cu privire la mijlocul folosit pentru a ne deplasa, suntem antrenați pentru ritualurile noastre (cumpărături, vizite, drumuri uzuale) în sistemul de transport al orașului din care facem parte. Și nu numai atât. În timpul vacanțelor, al călătoriilor de afaceri sau cu caracter personal, suntem beneficiarii dar și subiecții rețelelor de transport și al infrastructurii adiacente.

Smart City a devenit un element constant în cadrul politicilor urbane ale orașelor, nu numai în spațiul Occidental, dar și în cel Oriental. Astfel de abordări se concentrează asupra inovării urbane bazate pe tehnologie și pe digitalizare și sunt adesea considerate a fi o soluție universală pentru diferitele problemele urbane din orașe. Modul în care funcționează politicile Smart City în orașele contemporane este examinat în domeniul academic, emergent, dar încă subdezvoltat: prin „urbanism inteligent". Consecințele considerabile ale strategiilor Smart City necesită angajarea critică a rațiunii, a metodelor, a grupului țintă și a implicațiilor abordărilor Smart City în diferite contexte urbane.

Trei dimensiuni necesită o dezvoltare ulterioară pentru a facilita o analiză cuprinzătoare a ceea ce înseamnă politica Smart City pentru viața urbană contemporană: (1) recunoașterea faptului că planul urban nu se limitează la granițele administrative ale unui oraș; (2) importanța situațiilor sociale, economice, culturale și politice locale și de mediu în analiza dezvoltării, implementării și

efectelor politicilor Smart City; și (3) construcția social-politică a ambelor probleme urbane, deoarece politicile orașului Smart urmăresc să propună anumite soluții.

Un oraș nu are în alcătuirea sa doar clădiri, șosele, parcuri, grădini, etc. Un oraș este definit de toate componentele care descriu complexitatea vieții sociale, inclusiv conducte de apă, rețele de cabluri, infrastructură de transport, puncte nodale etc. Mai mult, el este în profunzimea sa rezultatul unor serii de interacțiuni sociale și o configurație tipică a relațiilor interumane.

Dat fiind faptul ca transportul este una dintre cele mai complicate și principalele probleme ale vieții urbane în orice tip de stat, este necesară o abordare vizionară și științifico-practică. Reducerea timpului de călătorie, de exemplu, este o modalitate de a reduce și anumite costuri ale sale. Transportul public are anumite aspecte specifice precum puncte cadru, rute fixe și un orar prestabilit.

Această direcție de cercetare va viza atât aceste aspecte, cât și, ca exemplu infrastructura și stațiile mijloacelor de transport și modul în care acestea sunt amplasate și concepute. Incorporează aspecte ca trecerile de pietoni și managementul eficient. Aici, un caz particular în reprezintă contextul în care trecerile fac accesul și facilitează fluxul de oameni din apropierea stațiilor de mijloacele de transport public.

Transportul public (ca și orașul evident) trebuie să fie definit prin mobilitate inteligentă și durabilitate. Dezvoltarea unui oraș din punct de vedere economic și social depinde și de nivelul în care se află rețeaua de transport public. Alături de învățământ, comerț. sănătate, serviciile de energie elctrică, gaze naturale și apă care influențează nivelul de existență a oamenilor în cadrul unui oraș, transportul public are un rol fundamental în viața socială a locuitorilor și în funcționarea infrastructurii orașului în ansamblul său, asigurând mobilitatea acestora. În acest sens, o intervenție cheie o reprezintă dezvoltarea unui sistem integrat de transport.

În România o problemă este reprezentată de numărul insuficient de mijloace de transport (fie autobuze, fie tramvaie) pe anumite rute, care, pe cale de consecință logică, duce la un timp mare de așteptare și la aglomerare. O altă problemă este starea în care se află aceste mijloace – uzura tehnică, dar și starea necorespunzătoare a anumitor artere de circulație. În București, acest lucru se poate observa doar la o simplă călătorie între două puncte importante – Piața Unirii – Piața Romană. Acestor probleme se alătură lipsa de instalații de semaforizare în puncte cheie (intersecții sau noduri) și corelarea deficitară a semafoarelor existente. Acest fapt conduce la un transport marcat de stopuri pe traseu și de nemulțumire generală în rândul utilizatorilor.

O serie de alte probleme ale transportului public sunt: numărul redus de puncte pentru achiziționarea biletelor și abonamentelor, lipsa dotărilor în stațiile de așteptare (tăbliețele de identificare a stațiilor, cele cu traseele care trec prin stația respectivă, informațiile referitoare la orarul de circulație a vehiculelor), frecvența de succedare a mijloacelor de transport. Acest exemplu este unul micro, privind doar un element – transportul în comun din cadrul unui oraș. Discutând de nivelul macro, problemele se extind și se complică.

Pentru România se conturează o serie de soluții viabile (vom enumera în acest punct doar câteva): benzi concepute și gândite special pentru transportul în comun,

monitorizarea prin GPS pentru mijloacele de transport în comun, centre de transbordare, rute noi şi abonament unic, parcări pentru biciclete, dezvoltarea unei căi ferate pentru trenuri de mare viteză care să ofere servicii rapide, de încredere şi confortabile şi care poate fi conectate cu sistemul rutier de autobuz, de metrou şi cu sistemul aerian pentru asigurarea unei mai bune sinergii şi pentru un regim de navetă mai bun.

Putem spune că urbanismul a existat permanent în conştiinţa umană, cu toate că s-a conturat în forma actuală abia în secolul XX, mai ales după Congresul Internaţional al Arhitecturii Moderne (iniţiat de Le Corbusier) şi prin adoptarea Cartei de la Atena. Aceste două repere au marcat în istorie, aşa cum am menţionat anterior, începutul *urbanismului modern*.

În linii mari prin urbanizare, putem înţelege tendinţa sistemelor de aşezări de a avea caracteristice urbane prin creşterea calităţii habitatului de locuire, prin transformarea unor aşezări rurale în oraşe şi prin extinderea teritorială a oraşelor.

În cartea „*Elemente de Urbanism*", semnată de Cristina Alpopi, înainte de a fi oferită o definiţie se face deosebire între tipurile de urbanism, raportat la evoluţia sa în istorie. Astfel, succint, observăm concret că se conturează anumite perioade: urbanism antic, premodern, urbanismul marcat de era industrializării, urbanismul modern şi cel regăsit din anii 30. Cristina Alpopi în cartea menţionată anterior plasează contextul în care acest concept s-a dezvoltat: *„în trecut, era considerat disciplina care se ocupa de sistematizarea şi dezvotlarea oraşelor, cautând cu ajutorul tuturor resurselor tehnice disponibile să determine cea mai bună dispunere a străzilor, clădirilor şi instalaţiilor publice, precum şi a locuinţelor private, în aşa fel încât populaţia să ducă o viaţă comodă, plăcută şi sănătoasă*" (Cristina Alpopi). Definiţia propusă de autoare vine ca urmare a economiei generale a dinamicii aferente prezentate: „*Urbanismul este ştiinţa care, pe plan social şi uman, studiază sistematizarea raţională a oraşelor, comunelor, teritoriilor, mijloacelor de comunicaţie cu scopul de a realiza cele mai bune condiţii de viaţă pentru colectivităţi"* (Cristina Alpopi).

„Urbanism as a way of life", de Louis Wirth, în 1938 menţiona că „*în ciuda importanţei preponderente a oraşului în civilizaţia noastră, totuşi cunoştinţele noastre despre natura urbanismului şi procesul de urbanizare sunt slabe. Multe încercări au fost făcute cu adevărat pentru a izola caracteristicile culturale ale vieţii urbane*" (Louis Wirth). Astfel autorul, considera o figură centrală a domeniului urbanist, argumentează că o definiţie precisă nu poate fi identificată, ci doar anumite caracteristici ce stau la baza urbanismului: oraşul în sine şi existenţa în modul său de organizare.

Literatura de specialitate, în multe cazuri, omite să precizeze în mod clar definiţia de la care porneşte în momentul în care dezbate principiile urbanismului sau aspecte specifice. Acest detaliu a fost cel mai bine surprins în lucrarea „Origins and Development of Urbanism", în care se face următoarea menţiune: „*Oraşul, cadrul urban, societatea urbană şi urbanizarea sunt adesea concepte subteoretizate şi este uşor să existe publicaţii care lasă aceşti termeni nedefiniţi presupunând că ştim cu toţii ce înseamnă*" (George Cowgill, 2004). De exemplu, *Carta Urbanismului European*, adoptată în 2013, se raliază la acest curent: „*Urbanismul permite comunităţilor să formuleze viziuni strategice pentru a-şi atinge aspiraţiile. Expresia acestor viziuni*

strategice poate influența, direct și semnificativ, crearea unor zone optime pentru locuit și construirea unui viitor durabil pentru comunitățile de pe tot cuprinsul Europei. Urbanismul, asociat amenajării teritoriului, intervine la toate planurile teritoriale, de la cel local la cel național, transfrontalier și dincolo de frontierele europene" (Carta Urbanismului European). Din cadrul paragrafului, deducem anumite aspecte ale urbanismului, dar nu este prezentată o definiție concretă a acestuia. Cu toate acestea putem identifica și o serie de lucrări care emit o definiție. În „Les Principles de L'urbanisme", urbanismul este definit ca *„un ansamblu de măsuri politice, administrative, financiare, economice, sociale sau tehnice destinate să asigure o dezvoltare armonioasă a unui oraș (Les Principles de L'urbanisme)".* În „Citta e territorio", urbanismul este văzut ca *„o îmbinare între morală, politică, știință, tehnică și artă*" (Doddi C.).

O parte din definiții înțeleg prin „urbanism" orice acțiune destinată să conceapă, să organizeze, să amenajeze sau să transforme orașul și spațiul urban. În anumite texte acest lucru este prezentat și ca fiind o „arta urbană" și apanajul unor capacități arhitecturale.

O altă parte de definiții au în vedere aspectul tehnic, punând accept pe acest tip de măsuri, cu accent pe dezvoltarea armonioasă, rațională și umană a localităților (Constantin Enache, Angela Filipeanu).

Din alte punct de vedere, urbanismul este perceput și prin transformările suferite de anumit teritoriu. În acest mod, accentul este pus pe spațiul în care se dezvoltă un amplasament urban și modalitățile după care aceste transformări se efectuează, actorii care fac aceste transformări și motivațiile lor, tehnicile utilizate, rezultatele scontate, rezultatele și consecințele efective. Aceste definiții includ geografi și geologi, topografi, ingineri, sociologi, juriști, econimiști, arhitecți și urbaniști (Francoise Choay, 1979).

Din punct de vedere al practicalității și comunității, urbanismul reprezintă un ansamblu complex de activități de proiectare, avizare, aprobare a unor planuri sau autorizare a construcțiilor viitoare pentru oricare tip de localitate (urbană sau rurală). El se încarcă de un ansamblu de măsuri politice, administrative, financiare, economice, sociale sau tehnice destinate să asigure dezvoltarea armonioasă sau durabilă/sustenabilă a unui oraș (François Ascher, 2008).

Toate aceste definiții și precizări indică faptul că urbanismul este în relație de interdependența cu conceptul de „amenajarea teritoriului". Prin amenajarea teritoriului se înțelege programul de măsuri coerente destinat dezvoltării echilibrate a tuturor localităților prin repartiția eficientă a resurselor, a populației și a activităților. Desigur relația de interdependență are și alte valențe. De exemplu, din anumite perspective această relație face ca amenajarea teritoriului să devină o parte a conceptului de urbanism, iar obiectivele primului devin obiective comune ale întregului astfel creat. Potrivit legilor în vigoare, amenajarea teritoriului se ocupă în principal de soluționarea anumitor difuncționalități și prin urmare de îmbunătățirea condițiilor de trai ale populației vizate. În principal nevoile oamenilor dictează direcțiile amenajării teritoriului. Folosind această logică observăm că asigurarea unor spații de locuit este un alt element central, precum este de altfel și accesul la

majoritatea serviciilor publice disponibile. Toate categoriile de cetăţeni sunt urmărite, inclusiv vârstnicii, persoanele cu dizabilităţi şi copii.

Amenajarea teritoriului respectă şi principiiile de extindere controlată şi matematică/funcţională a zonelor ce urmează a fi construite, pentru a eficientiza ariile disponibile şi a nu exista un dezechilibru urbanistic. Aici sunt incluse şi considerente de calitate şi protecţie. Calitatea are în vedere proiectele ce urmează a fi implementate şi corelarea acestora la nevoi, resurse, cadrul existent şi armonia generală. Protecţia, termen general mai bine înţeles prin sensul de *„protejare"*, are ca obiectiv principal elementul specific cultural şi natural al regiunii şi include reliefarea şi prezentarea optimă a patrimoniului naţional.

Un element de o deosebită importanţă din ansamblul amenajării teritoriului este prevenirea dezastrelor naturale prin protejarea ansamblului construit şi prin prevenirea posibilelor riscuri tehnologice (art 13, Legea nr 350/2001 privind amenajarea teritoriului şi urbanismul cu modificările şi completările ulterioare).

Din anumite perspective regăsite în literatura de specialitate amenajarea teritoriului nu este o parte a urbanismului, ci invers. Din această prismă, amenajarea teritoriului include conceptul de urbanism, fiind considerat un domeniu mult mai complex şi mai cuprinzător. Ii sunt atribuite caracteristici esenţiale, devenind cadru normativ, instrument şi mijloc de soluţionare. Amenajarea teritoriului include în acest mod cadrul teroretic de cunoaştere, analiză şi evaluare. Este un instrument de planificare şi de studiu prospectiv, dar şi de readaptare a mediului în funcţie de nevoi în permanentă schimbare.

„Carta Europeană a Amenajării Teritoriului", adoptată în 1983 în Spania, prezintă o viziune integratoare: *„amenajarea teritorial/spaţială conferă o exprimare geografică a politicilor economice, sociale, culturale şi ecologice ale societăţii.*" (*Carta Europeană a Amenajării Teritoriului*, 1983). Definiţia pe care o emite privind amenajare teritoriului este şi cea de la care pleacă şi materialul prezent: „ *(amenajarea teritoriului)* este în acelaşi timp o disciplină ştiinţifică, o tehnică administrativă şi o politică condusă ca o abordare interdisciplinară şi cuprinzătoare îndreptată spre o dezvoltare regională echilibrată şi spre o organizare fizică a spaţiului realizată în conformitate cu o strategie globală" (Carta Europeană a Amenajării Teritoriului, 1983).

Folosesc ca reper acest document, deoarece Carta este un *„document care defineşte pe plan european obiectivele fundamentale ale amenajării teritoriului"* (*Carta Europeană a Amenajării Teritoriului*, 1983)*,* reprezenând un compendiu şi un punct de reper important. Carta este printre primele care ilustrează în mod pertinent şi dimensiunea internaţională a amenajării teritoriului: *„este un instrument important pentru evoluţia societăţii europene şi că intensificarea cooperării internaţionale în acest domeniu reprezintă o contribuţie substanţială la întărirea identităţii europene*" (*Carta Europeană a Amenajării Teritoriului*, 1983).

Mai mult, în corpul acesteia sunt detaliate caracteristicile amenajării teritoriului: democratică, cuprinzătoare, funcţională şi orientată pe termen lung. Prima caracteristică face referire la implicarea deciziei politice şi a locuitorilor în procesul de planificare şi realizare a amenajării. Cea de-a doua, urmăreşte politicile sectoriale, politicile publice şi integrarea la nivel internaţional, într-o abordare

omogenă. Aspectul funcţional *„ţine cont de conştiinţa regională bazată pe valori, cultură şi interese comune care uneori depăşesc hotarele administrative şi teritoriale, ţinând în acelaşi timp cont de înţelegerile instituţionale”* (*Carta Europeană a Amenajării Teritoriului*, 1983). Faptul că orice amenajare teritorială trebuie realizată pe termen lung este evidentă, fiind necesar ca aceasta să ţină cont de specificul societăţii din punct de vedere social, cultural, ecologic şi de mediu.

Obiectivele acestui concept, precum derivă din Cartă, sunt:

1. dezvoltarea socio-economică echilibrată a regiunilor;
2. îmbunătăţirea calităţii vieţii;
3. gestionarea responsabilă a resurselor naturale şi protecţia mediului;
4. folosirea raţională a terenului (*Carta Europeană a Amenajării Teritoriului*, 1983).

O menţiune importantă este faptul că amenajarea teritoriului şi îndeplinirea obiectivelor sale este o responsabilitate a domeniului politic („Realizarea obiectivelor amenajării regional/spaţiale este în mod esenţial o problemă politică”).

Un alt document relevant este „Schema de dezvoltare a spaţiului comunitar” adoptat în 1999, la Potsdam, Germania. Din acest document reiese în mod evident aspectul politic al amenajării teritoriale şi spaţiale la nivel european. Punctul de plecare al acestui document este dezvoltarea spaţială care trebuie să contrabalanseze concentrarea puterilor şi activităţilor UE în jurul pentagonului oraşelor europene şi să ţină seama de extinderile succesive, astfel încât să nu marginalizeze noile state membre (Schema de Dezvoltare a Spatiului Comunitar). Sunt incluse în aceast material şi sistemele de transport şi comunicaţii nu numai la nivel naţional, dar şi regional. Implică şi aspecte privind specificul naţional şi nevoia de protejare a patrimoniului cultural specific fiecărui stat membru, dar şi al mediului înconjurător (Schema de Dezvoltare a Spatiului Comunitar).

În ceea ce priveşte spaţiul european, alte două documente pot fi menţionate în contextul urbanismul şi amenajării teritoriale. „Carta de la Leipzig” din 2007 oferă două direcţii importante pentru amenajarea teritoriului. În primul rând utilizarea mai intensă a abordărilor integrate ale politicii de dezvoltare urbană şi în al doilea rând acordarea unei atenţii speciale cartierelor defavorizate în contextul întregului oraş (Carta de la Leipzig, 2007). „Declaraţia de la Toledo” din 2010 propune un urbanism inteligent, bazat pe regenerarea integrării urbane şi armonizarea cu tehnologiile existente. Documentul subliniază nevoia pentru dezvoltare durabilă la nivelul oraşelor europene şi concretizarea politicilor de amenajare a teritoriului pentru a desemna un traiect bazat pe eficientizare.

„Carta Europeană a Amenajării Teritoriului” şi „Schema de dezvoltare a spaţiului comunitar” reprezintă două documente importante la nivel european şi internaţional, dar sunt şi un reper *„la care România îşi aliniază politicile sale*” (http://mdrap.ro/dezvoltare-teritoriala/amenajarea-teritoriului/amenajarea-teritoriului-in-context-european). La nivel naţional, amenajarea teritoriului şi activităţile de urbanism sunt reglementate de Legea nr. 350/2001 privind amenajarea teritoriului şi urbanismul, cu modificările ulterioare (Legea nr. 350/2001).

Amenajarea teritoriului este percepută în termenii următori: *„Scopul de bază al amenajării teritoriului îl constituie armonizarea la nivelul întregului teritoriu a politicilor economice, sociale, ecologice şi culturale, stabilite la nivel naţional şi local*

pentru asigurarea echilibrului în dezvoltarea diferitelor zone ale ţării, urmărindu-se creşterea coeziunii şi eficienţei relaţiilor economice şi sociale dintre acestea" (Legea nr. 350/2001, cap 2, art.7). Potrivit legii se conturează şi obiectivele specifice activităţii:

„a) dezvoltarea economică şi socială echilibrată a regiunilor şi zonelor, cu respectarea specificului acestora;

b) îmbunătăţirea calităţii vieţii oamenilor şi colectivităţilor umane;

c) gestionarea responsabilă a resurselor naturale şi protecţia mediului;

d) utilizarea raţională a teritoriului" (Legea nr. 350/2001, cap 2, art.7).

Secţiunea a 2-a oferă şi o perspectivă asupra urbanismului. Articolul 10 stipulează că *„urbanismul are ca principal scop stimularea evoluţiei complexe a localităţilor, prin realizarea strategiilor de dezvoltare pe termen scurt, mediu şi lung" (Legea nr. 350/2001, sect 2, art.10).* Fiind în ton cu abordările teoretice specifice domeniului, legea mai stipulează că *„activitatea de urbanism cuprinde toate localităţile ţării, organizate în reţea, pe baza ierarhizării şi distribuţiei echilibrate a acestora în teritoriu. Aplicarea obiectivelor are în vedere întregul teritoriu administrativ al oraşelor şi comunelor sau zone din acestea* şi că *urbanismul urmăreşte stabilirea direcţiilor dezvoltării spaţiale a localităţilor urbane şi rurale, în acord cu potenţialul acestora şi cu aspiraţiile locuitorilor.*

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Digitalizarea administrației publice din România în raport cu tendințele europene

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Abstract

Digitalizarea administrației publice constituie un subiect de interes atât pentru autorități, cât și pentru beneficiarii serviciilor publice, în speță, cetățenii. Prezenta lucrare își propune să evidențieze parcursul României în ceea ce privește digitalizarea sectorului public, iar în această direcție vom analiza tendințele europene și influența pe care au avut-o asupra situației naționale. Atenția acordată acestui subiect este fundamentată de necesitatea dezvoltării unei e-guvernări cu scopul de a eficientiza și de a inova serviciile prin intermediul implementării noilor tehnologii. În acest sens, se prezumă că e-guvernarea conduce către dezvoltarea orașelor inteligente și contribuie la creșterea calității vieții, iar pe parcursul acestei lucrări vom dovedi aplicabilitatea acestui deziderat prin intermediul unei abordări descriptive, datele interpretate fiind colectate utilizând metode calitative (observație documentară și analiză de conținut). Chiar dacă este un subiect nou abordat de către practicieni și teoreticieni, există o vastă literatură de specialitate, urmând a fi analizate studiile empirice efectuate asupra conceptelor de e-guvernare, digitalizare, orașe inteligente, dar și asupra calității vieții în raport cu acestea. Studiul de caz asupra necesității și implementării digitalizării guvernării presupune și analiza legislației naționale și europene, aceasta fiind ulterior supuse interpretării. Astfel, lucrarea va sublinia stadiul în care România se află din punct de vedere al digitalizării serviciilor publice, impactul pe care îl au acțiunile întreprinse până în prezent, dar și factorii cheie de care depinde procesul. De asemenea, vor fi trasate posibile direcții de acțiune în vederea continuării și consolidării procesului de digitalizare a sectorului public.

Cuvinte cheie: *E-guvernare, calitatea vieții, servicii publice eficiente, influența legislației, necesitatea implementării noilor tehnologii.*

1. Introducere

Elaborarea acestei lucrări a fost influenţată de contextul actual în ceea ce priveşte gradul de digitalizare al administraţiei publice din România. În acest sens, în secţiunile lucrării vom identifica şi analiza principalele concepte utilizate, necesitatea digitalizări şi parcursul pe care România l-a înregistrat în ceea ce priveşte digitalizarea administraţiei în raport cu tendinţele Europene.

În ansamblul său, administraţia publică este responsabilă de asigurarea cerinţelor esenţiale ale colectivităţii naţionale, asigurând îndeplinirea intereselor naţionale, teritoriale sau locale. Date fiind schimbările constate ce survin în ceea ce priveşte mediul socio-economic şi politic, acţiunile de perfecţionare şi adaptare la aceste schimbări trebuie să reprezinte o prioritate a autorităţilor, astfel încât societatea să se afle într-o continuă evoluţie prin prisma funcţionalităţii, eficienţei, flexibilităţii şi adaptării la realităţile curente. În ceea ce priveşte reformarea sectorului public, începând cu anul 1989, toate guvernările au avut în vedere reformarea administraţiei publice, iar perioada de preaderare la Uniunea Europeană a presupus pentru România schimbări majore astfel încât să se încadreze cerinţelor impuse de acestea. Influenţa tendinţelor europene s-a resimţit şi după acest moment, fapt pentru care, pe parcursul lucrării, ne vom concentra atenţia asupra influenţei avute în ceea ce priveşte digitalizarea. În esenţă, de-a lungul timpului, chiar dacă reformarea a fost inclusă în planurile de guvernare, acţiunile întreprinse au dovedit că reforma administraţiei publice, în deplinătatea sensului, nu se situează printre priorităţi, ceea ce a condus la o „mimare a reformei, lipsită de consistenţă şi de o finalitate practică şi perfect funcţională". [1] În domeniul tehnologiei, au fost elaborate diverse strategii şi documente, precum „Strategia Naţională privind Agenda Digitală pentru România 2020" [2] sau „Strategia privind informatizarea administraţiei publice" [3], iar pe parcursul lucrării vom supune interpretării transpunerea în practică a acestora şi vom identifica factorii de care a depins procesul de implementare. De asemenea, vom analiza poziţia României la nivel european în ceea ce priveşte gradul de digitalizare şi vom trasa posibile direcţii de acţiune în vederea îmbunătăţirii stadiului actual.

2. Delimitări conceptuale

Această secţiune are menirea de a familiariza cititorul cu conceptele utilizate pe parcursul lucrării, astfel încât să faciliteze înţelegerea ideilor care urmează a fi expuse.

Administraţia presupune un ansamblu de organe administrative, caracteristic societăţii moderne. Acest ansamblu este responsabil în ceea ce priveşte dezvoltarea social-economică şi politică a unei ţări [4]. Astfel, administraţia publică reflectă bazele instituţionale ale modului în care sunt guvernate ţările [5], fapt pentru care conceptul de administraţie publică este strâns legat de cele de guvernare şi guvernanţă.

Din perspectiva autorilor John Graham, Bruce Amos şi Tim Plumptre [6], guvernanţa reprezintă un subiect care a stârnit interes şi a deschis noi dezbateri în spaţiul intelectual. Astfel, autorii apreciază că acest concept face referire la modul în

care guvernele interacţionează cu alte organizaţii, se raportează la cetăţeni şi modul în care sunt luate deciziile. Cu alte cuvinte, guvernanţa este un proces prin care societăţile sau organizaţiile iau decizii şi determină pe cine implică în acest proces. Acest proces este fundamentat pe un sistem sau un cadru de guvernare, mai precis pe acorduri, proceduri, convenţii sau politici care definesc cui îi este atribuită puterea, modul în care se iau deciziile şi cui îi aparţine răspunderea. Buna guvernanţă permite analiza rolului guvernului în faţa problemelor publice şi identificarea contribuţiei pe care o pot avea celelalte părţi interesate (cetăţenii, antreprenorii etc). Guvernarea în spaţiul naţional al statelor se regăseşte pe mai multe nivele, implicit naţional, regional, local şi comunal, iar una dintre preocupările guvernului este identificarea manierei în care actorii (cetăţenii, organizaţiile societăţii civile etc) se pot implica în luarea deciziilor privitoare la problemele publice care îi vizează. Astfel, buna guvernanţă pune accentul pe crearea de reţele şi mai puţin pe ierarhii. [7]

În viziunea lui Rhodes [8], guvernanţa presupune o nouă abordare, un nou mod de guvernare, iar în literatura de specialitate, ideea de „noutate" este regăsită în 4 modele: modelul statului minimal, guvernării corporative, noului management public şi în cadrul bunei guvernanţe. De aici deducem că buna guvernanţă reprezintă o nouă abordare, un model dezvoltat în timp în conformitate cu evoluţia socio-economică şi politică a statelor. Din perspectiva lui Rhodes, buna guvernanţă presupune o guvernare birocratică care se bazează pe cultura politică democratică şi pe organizaţiile administrative eficiente. Rezultatele acestui proces se traduc în politici publice care reflectă voinţa comunităţii deservite. Aşadar, buna guvernanţă implică un guvern democratic, descentralizat, puternic şi responsabil. Buna guvernanţă este proiectată prin suma politicilor publice orientate spre dezvoltarea umană sustenabilă. [9]

Conform Constituţiei României [10], art. 102, alin. 1, Guvernul exercită conducerea generală a administraţiei publice. Sintetizând normele prevăzute la Capitolul V din Constituţia României, capitol referitor la administraţia publică, aceasta se clasifică în administraţie publică centrală şi de specialitate şi administraţie publică locală. Astfel, regimul administrativ oglindeşte modalitatea de reglementare a raporturilor dintre autoritatea centrală şi cea locală [11]. Administraţia publică este responsabilă de aspecte cu care ne confruntăm în mod uzual, iar evoluţia permanentă a vieţii cotidiene conduce către necesitatea îmbunătăţirii performanţelor acesteia. În acest sens, guvernul este răspunzător de modul în care sunt furnizate serviciile publice şi de stabilirea priorităţilor privind îmbunătăţirea acestora. O simplă furnizare a serviciilor necesare subzistenţei cetăţenilor nu reflectă o îndeplinire corespunzătoare a atribuţiilor [12], fapt pentru care este necesară o bună guvernanţă, nu o simplă guvernare.

Termenul de e-guvernare nu este unitar definit în literatura de specialitate, însă putem afirma că presupune utilizarea noilor tehnologii de comunicare şi a aplicaţiilor informatice de către administraţia publică centrală şi locală, cu scopul de a creşte eficienţa şi eficacitatea serviciilor publice. [13] Astfel, guvernarea electronică facilitează interacţiunea dintre cetăţeni (care sunt beneficiarii serviciilor publice) şi organizaţiile pe care le înglobează administraţia publică. [14] E-

guvernarea poate fi prezentată ca o soluție de îmbunătățire a serviciilor, aceasta presupunând atât participarea cetățenilor la procesul de luare a deciziilor, cât și responsabilizarea autorităților în mod transparent și eficient. [15]

Digitalizarea sectorului public presupune: diminuarea timpului pe care cetățenii îl alocă în mod firesc activităților uzuale necesare; reducerea costurilor; reducerea birocrației; creșterea accesibilității la serviciile publice; îmbunătățirea comunicării cu cetățenii. Implementarea serviciilor digitale va conduce la creșterea satisfacției beneficiarilor și a eficienței și eficacității sectorului public, iar în ceea ce privește relația cu membrii societății, facilitează apropierea autorităților de cetățeni și nevoile acestora.

Dezvoltarea unui oraș inteligent (denumit și *smart city)* presupune transformări esențiale care să genereze soluții privind inovarea și adaptarea la schimbările constante ale mediului. Pentru a se afla într-o constantă adaptare, un oraș inteligent are în vedere elaborarea politicilor și strategiilor de dezvoltare în concordanță cu evoluția tehnologică, dezvoltarea mecanismelor de guvernanță participativă și pune accent pe dezvoltarea parteneriatelor public-privat. De asemenea, regăsim dezvoltarea durabilă și creșterea calității vieții printre preocupările principale ale unui oraș inteligent. Prin intermediul tehnologiei, cetățenii au acces la o gamă largă de servicii publice, aspect care generează evoluție în ceea ce privește îndeplinirea nevoilor și așteptărilor cetățenilor. Un oraș inteligent înglobează sisteme performante, interconectate, în baza cărora se dezvoltă aplicații necesare creșterii calității vieții cetățenilor, în raport cu nevoile lor specifice. Astfel, orașele inteligente își focusează atenția asupra regândirii guvernanței și a modalităților de funcționare a serviciilor, având drept obiectiv atât creșterea cooperării dintre toți actorii sistemului (organizații publice, organizații private, cetățeni), adaptarea la cerințele europene în domeniul dezvoltării durabile, cât și transpunerea noilor tehnologii de comunicare și a aplicațiilor informatice în viața de zi cu zi. [16]

Preocuparea comunităților față de subiectul dezvoltării durabile provine din problematica de a reuși satisfacerea nevoilor de actualitate ale societății, însă fără a compromite capacitatea generațiilor viitoare de a-și îndeplini propriile nevoie în baza resurselor planetei. [17]

Așa cum am menționat, nu poate fi dezvoltat un oraș inteligent în lipsa unei administrații publice eficiente, flexibile și adaptabilă schimbărilor generate de mediul socio-economic și politic.[18] De asemenea, digitalizarea administrației publice contribuie la creșterea eficienței acesteia. În baza acestor premise, deducem interconectivitatea dintre conceptele de „digitalizare" și „oraș inteligent". Orașul inteligent are în vedere dezvoltarea serviciilor prin intermediul tehnologiei, conducând la îmbunătățirea comunicării cu cetățenii, dezvoltarea unei comunități durabile, creșterea calității vieții, reducerea costurilor și perfecționarea guvernanței, transportului, energiei, infrastructurii, educației, sănătății, utilităților. În plus, în cadrul unui astfel de mediu, sunt esențiale și măsurile de îmbunătățire a competențelor digitale ale populației și de înzestrare corespunzătoare, astfel încât măsurile implementate să poată fi accesibile lor. [19]

3. Studiu asupra necesităţii digitalizării administraţiei publice

3.1. Necesitatea digitalizării serviciilor publice

Necesitatea implementării serviciilor digitale este fundamentată atât de beneficiile pe care le presupune o asemenea schimbare, cât şi de adaptarea la realităţile tehnologice, socio-economice şi politice. Astfel de servicii se prezumă a fi disponibile permanent, în orice zi a săptămânii, ceea ce permite cetăţeanului să aibă acces personalizat, în raport cu propriul program. De altfel, creşte transparenţa, se reduce birocraţia şi corupţia, iar accesul cetăţeanului nu mai presupune confruntarea cu structuri complexe ale administraţiei publice şi se elimină timpul acordat deplasării, statului la coadă etc. Cu cât accesul cetăţeanului la serviciile publice este mai facil, cu atât încrederea şi gradul de satisfacţie faţă de administraţie vor creşte. Atenţia autorităţilor faţă de nevoile şi aşteptările cetăţeanului ilustrează o administraţie publică eficientă, care îşi consolidează deciziile în temeiul informaţiilor colectate de la beneficiarii serviciilor oferite, ceea ce presupune un sistem de feedback funcţional şi disponibil tuturor cetăţenilor. [20]

În plus, utilizarea tehnologiei conduce la reducerea timpului alocat prestării de servicii şi contribuie la dezvoltarea capitalului uman (creşterea calificării forţei de muncă şi înzestrarea cu abilităţi de inovare), ceea ce are un impact pozitiv asupra productivităţii muncii. [21]

În contextul actual, al pandemiei cu virusul SARS-COV-2, autorităţile române au fost nevoite să accelereze procesul de digitalizare a anumitor servicii, astfel încât să reducă contactul dintre cetăţeni, cât şi între aceştia şi lucrătorii serviciilor publice, din motive de siguranţă sanitară. Printre aceste demersuri regăsim adaptarea legislaţiei astfel încât să permită digitalizarea serviciilor publice, iar un exemplu în acest sens îl reprezintă Ordonanţa de urgenţă nr. 38/2020 [22] privind utilizarea înscrisurilor în formă electronică la nivelul autorităţilor şi instituţiilor publice.

O altă încercare o reprezintă propunerea legislativă PL-x nr. 411/2020 [23] (Proiect de Lege pentru digitalizarea administraţiei publice, prin eliminarea hârtiei din fluxul intern şi interinstituţional, precum şi pentru modificarea şi completarea Legii nr.135/2007 privind arhivarea documentelor în formă electronică), însă aceasta se află încă în dezbatere, în condiţiile unui sistem legislativ lent şi de durată. Adoptarea unei astfel de legi ar presupune diminuarea posibilităţii răspândirii virusilor prin eliminarea obligativităţii contactului fizic; facilitarea comunicării şi eliminarea barierelor în acest sens; posibilitatea lucrului de acasă; scăderea birocraţiei; posibilitatea funcţionării serviciilor administraţiei publice în cazul urgenţelor naţionale; scăderea utilizării hârtiei şi a curierilor; implementarea unui sistem de certificare a documentelor în sistem electronic; tehnologizarea administraţiei în raport cu directivele europene.

Impedimentele cu care s-ar confrunta implementarea acestei legi ar viza: costuri mari de dezvoltare a unui sistem electronic performant de management al documentelor; ineficienţa propunerii faţă de persoanele care nu au acces/au acces limitat la resurse informatice şi tehnologice; lipsa dotărilor necesare implementării;

timp îndelungat pentru implementarea completă a inițiativei. Pe de altă parte, aplicabilitatea unor astfel de măsuri poate fi facilitată prin intermediul fondurilor europene care pot fi accesate, prin intermediul legislației permisive privind dezvoltarea unei administrații publice online, cât și prin dorința instituțiilor de a dezvolta un sistem de interconectare între acestea. Din păcate, însă, există și bariere precum: rezistența la schimbare, dovedită de personalul din administrația publică românească; posibilitatea inadaptării personalului la mijloacele moderne de lucru; rezistența arătată de persoanele reticențe în ceea ce privește utilizarea internetului în vederea rezolvării problemelor administrative etc.

Astfel, digitalizarea serviciilor publice trebuie să reprezinte o necesitate a comunităților, însă nu trebuie eliminate în totalitate metodele clasice de desfășurare a acestora, pentru a asigura accesul persoanelor aflate în imposibilitate de accesare a tehnologiei. În plus, digitalizarea presupune și inițierea de acțiuni care să educe populația privind utilizarea tehnologiei, astfel încât soluțiile să fie fiabile și accesibile unui procent cât mai mare dintre cetățeni.

3.2. Nivelul digitalizării României în raport cu țările Uniunii Europene

La nivelul statelor membre ale Uniunii Europene, din anul 2014, Comisia Europeană a demarat procedurile necesare în vederea monitorizării evoluție digitalizării aferentă fiecărei țări. În acest sens, a fost introdus indicele economiei și societății digitale (DESI). Anual, se realizează de către Comisia Europeană un astfel de raport, prin intermediul unui sistem de referință la 5 elemente. Acești indici sunt conectivitatea, capitalul uman, utilizarea serviciilor de internet, integrarea tehnologiei digitale, serviciile publice digitale.

În cuprinsul Raportului intermediar pentru anul 2017 privind sectorul digital din UE (EDPR), profil de țară: România [24] sunt definite referințele, după cum vom putea observa în cele ce urmează. Conectivitatea reprezintă, într-o manieră generală serviciile fixe și serviciile mobile de bandă largă, viteza și prețurile conexiunii de bandă. Capitalul uman are în vederea utilizarea internetului, a competențelor digitale de bază, precum și a competențelor digitale avansate. Utilizarea internetului înglobează folosirea de către cetățeni a conținutului comunicațiilor și tranzacțiilor din mediul online. Integrarea tehnologiei digitale are în vedere digitalizarea întreprinderilor și comerțului electronic. În cele din urmă, serviciile publice digitale, evident, au în vedere e-guvernarea. La rândul lor, fiecare dintre acești indici au în vedere câteva subcategorii de elemente la care se raportează.

În clasamentul țărilor Uniunii Europene, putem constata faptul că România se situează din perspectiva indicilor menționați anterior, pe locul 26 din 28. Comparativ cu alți ani, în 2016 România se poziționa pe locul 28, iar în anul 2017 se afla pe aceeași poziție. Începând cu anul 2018, România a ocupat locul 26, iar în 2019 și-a păstrat poziția.

Privind în mod particular exponentul care face referire la serviciile publice, rapoartele Comisiei Europene indică faptul că România, la capitolul servicii publice digitale se află în anul 2020 pe ultimul loc din clasament, respectiv 28. Acest loc a fost ocupat de către România începând cu anul 2016, rămânând constat până în 2020.

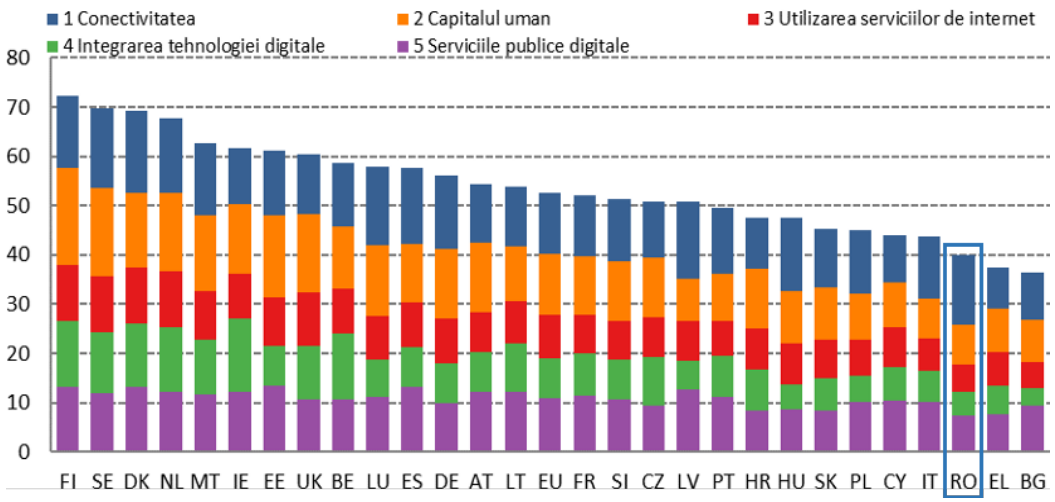

Fig. 1. Clasamentul pentru anul 2020 al Indicelui Economiei şi Societăţii digitale (DESI)
Sursa: Comisia Europeană - Indicele economiei şi societăţii digitale 2020

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Vectorii de referinţă pentru calcularea indicelui de e-guvernare sunt în număr de 4, aceştia fiind: procentul utilizatorilor soluţiilor de e-guvernare, formulare precompletate, furnizarea de servicii complete online şi datele deschise. Comisia Europeană, în raportarea anului 2020, menţionează faptul că ţara noastră se află sub media Uniunii Europene, însă se pot constata unele progrese, cu preponderenţă în ceea ce priveşte furnizarea serviciilor online, printr-o evoluţie a numărului acestora şi prin utilizarea precompletărilor automate ale formularelor pentru cetăţeni.

În aceeaşi idee, Comisia indică faptul că România nu înregistrează progrese însemnate în ultimii trei ani, ocupând ultimele poziţii în mod constant. Totuşi, există unul dintre vectorii componenţi ai indicelui, unde România se plasează pe locul 8 în Europa, respectiv la utilizatorii soluţiilor de e-guvernare, ceea ce înseamnă că există o bună interacţiune între autorităţile administraţiei publice şi cetăţeni. Comisia a subliniat faptul că la nivel naţional nu s-au identificat îmbunătăţiri ale serviciilor publice digitale în raport cu întreprinderile, situându-ne, la acest capitol, în urma clasamentului.

Una dintre necesităţile identificate în cuprinsul raportului pentru anul 2020 este interoperabilitate sistemelor IT din administraţia publică, Comisia apreciind faptul că niciunul dintre Guvernele României n-a reuşit să rezolve această problematică, dar în anul 2019 s-a lansat în consultare publică un proiect de lege în sensul realizării „Cadrului naţional de referinţă pentru interoperabilitatea în

domeniul IT". Scopul acestei legi este de a reduce birocrația și a simplifica întregul proces.

Identificarea electronică (nodul eiDAS) este, de asemenea, un alt proiect la nivel național, aflat încă în faza de dezvoltare, acesta fiind asumat pentru realizare până la sfârșitul anului 2020. Problema fundamentală cu privire la acest proiect, a fost considerată ca fiind costul necesar pentru semnătura digitală certificată a fiecărui utilizator, care este de aproximativ 40 de euro pe an.

În optica Comisiei Europene, din categoria cauzelor determinante ale lipsei digitalizării administrației publice din România fac parte inexistența unei bune coordonări la nivelul instituțiilor publice cu privire la instituirea unor servicii digitale, procentul ridicat de migrare al experților din domeniul tehnologiei informației din cadrul sectorului public înspre sectorul privat sau în afara spațiului național, dar și o carență la nivelul competențelor digitale, în general.

Un al doilea instrument de raportare a stadiului digitalizării, în ansamblul său, este studiul realizat de către Organizația Națiunilor Unite, cu referire la țările membre, evaluare realizată din perspectiva Indicelui de Dezvoltare al Guvernării Electronice (EGDI). Indexul EGDI înglobează trei elemente, respectiv criteriul infrastructurii de telecomunicații (TII), criteriul capitalului uman (HCI) și criteriul serviciilor online [25]. Pentru a putea realiza o evaluare a progresului României în ultimii ani, vom utiliza atât studiul Organizației Națiunilor Unite pentru anul 2020, cât și cel din anul 2018, fiind și ultimele realizate pentru evaluarea acestor criterii. Studiile sunt considerate ca fiind de referință în acest domeniu, fiind apreciat de către Organizația Națiunilor Unite, ca reprezentând un instrument pentru decidenții politici [26].

În anul 2018, România ocupa poziția 67 dintr-un total de 193 de state care au reprezentant grupul țintă al studiului. La o distanță de doi ani, România înregistrează unele evoluții, reușind să ocupe poziția 55 din 193 de state. Sunt configurate patru categorii, în funcție de nivelul indicilor, distingându-se: Very high EGDI Group, High EGDI Group, Middle EGDI Group, Low EGDI Group. România, conform acestor categorii, se află în Very high EGDI group, cunoscând o evoluție comparativ cu raportul pentru anul 2018, când se afla în High EGDI Group. [27]

Cu toate acestea, deși România cunoaște o poziționare internațională bună, studiul Organizației Națiunilor Unite, o situează, în plan european, la sfârșitul clasamentului [28]. Se concluzionează că Europa, ca ansamblu, ocupă poziția fruntașă în ceea ce privește dezvoltarea e-guvernării și furnizarea serviciilor online, toate regiunile făcând progrese în aceste domenii. Europa, este urmată de Asia, America, Oceania și Africa.

Un alt treilea studiu pe care îl vom aborda în cele din urmă, evaluat ca fiind relevant în materie de digitalizare [29], este realizat de către IMD World competitiveness center. Este axat pe 3 nivele, dintre care distingem knowledge (cunoștințele), technology (tehnologia) future readiness (integrare exigențelor tehnologiilor digitale, adaptabilitatea la noile tendințe digitale [30]). Obiectivul cercetării este acela de a analiza și identifica măsurile pe care țările le adoptă, precum și modul în care digitalizarea duce la realizarea unor politici guvernamentale, unor modele de afaceri sau consolidarea societății în general [31].

Analiza a fost realizată prin studierea a 63 de ţări, care prezintă particularităţi, atât din punct de vedere al poziţionării geografice, cât şi din perspectiva diferenţelor economice, culturale, sociale şi care cunosc diferite stadii ale dezvoltării. Apreciem faptul că diversitatea grupurilor de cercetare este necesară, pentru a putea fi identificate mecanismele cele mai optime în raport de necesităţile fiecărui stat în parte. O cuprindere cât mai mare a diferiţilor factori, vor determina rezultate specifice, cu soluţii de consolidare şi dezvoltare cât mai eficiente şi particularizate.

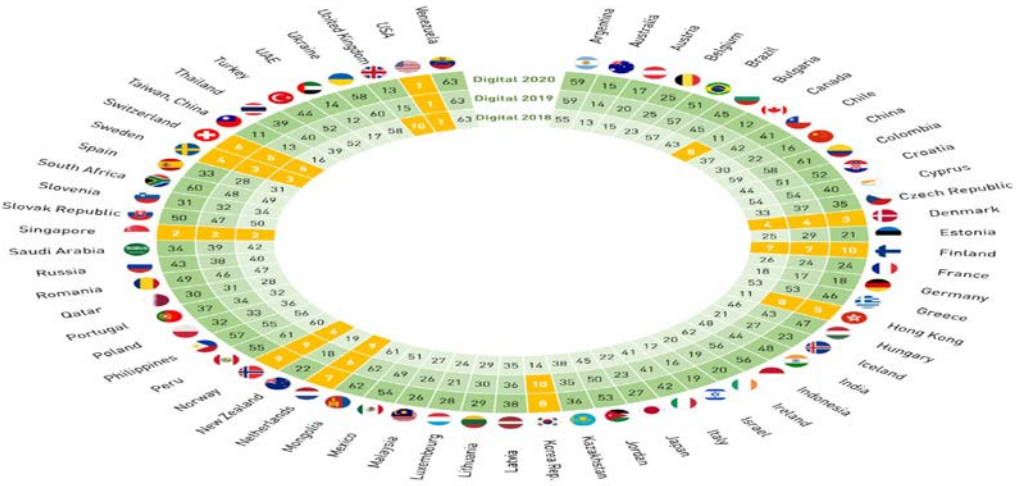

Fig . 2. Clasamentul competitivităţii digitale pentru anul 2020.
Sursa: Imd World competitiveness Center, Digital Competitiveness. Ranking 2020.

La nivelul României se poate constata o constanţă a digitalizării, ocupând poziţia 47 în anul 2018, poziţia 46 un an mai târziu, iar în prezent ocupă poziţia 49 din 63. E-guvernarea reprezintă, la rândul ei, unul dintre elementele privite în mod particular în cadrul analizei. Prin raportare la rezultate, România ocupă locul 48 în ierarhie dintr-un total de 63. În anul 2018, cercetarea Imd World, poziţiona România pe locul 54, fiind printre ultimele la nivelul Uniunii Europene. [32]

Elementele expuse, privite într-o manieră coroborată, duc la concluzia că la capitolul digitalizare, cu preponderenţă din perspectiva digitalizării administraţiei publice, nu identificăm un nivel accentuat al consolidării noilor tehnologii, al utilizării acestora în cadrul procesului de furnizare a serviciilor publice şi interconectării instituţiilor publice. Conform elementelor sus-menţionate, în plan extraeuropean, România ocupă o poziţie aflată peste medie. Cu toate acestea, în spaţiul european, conform rezultatelor analizate, atât în ultimii ani, cât şi pentru anul 2020 se poate observa cu facilitate faptul că se află într-o poziţie constantă în ceea ce priveşte nivelul scăzut al digitalizării. Printre cauzele care determină aceste situaţii, studiile au expus ca principale carenţe care determină imposibilitatea unor evoluţii sesizabile, sunt legate de cadrul legislativ, care este apreciat ca fiind nefavorabil unei implementări concrete, o lipsă a încrederii cetăţenilor în sistemele inovatoare, dar şi anumite dificultăţi de integrare a tehnologiilor în cadrul

Administrației Publice. [33] Concluzionăm, în cele din urmă, că România, este încă într-un stadiu incipient în ceea ce privește digitalizarea administrației publice, astfel cum a fost apreciat de către literatura de specialitate mai veche [34].

3.3. Legislația și strategiile național-europene în raport cu digitalizarea Administrației Publice

Ab initio, apreciem ca fiind indispensabilă identificarea, în cadrul organizării statale, a entităților care au competențe în ceea ce privește procesul de digitalizare al Administrației Publice și care sunt direcțiile pe care acestea le au în vedere. Principala instituție cu atribuții în ceea ce privește strategia, planificarea, elaborarea, precum și implementarea politicilor în ceea ce privește transformarea și digitalizarea societății informaționale este Autoritatea pentru Digitalizarea României. Autoritatea, este reglementată și funcționează în baza Hotărârii de Guvern nr. 89/2020 [35]. Autoritatea este în ființă din anul 2020, dar este înlocuitoarea Autorității pentru Agenda Digitală a României. Până în anul 2019, a funcționat și Ministerul Comunicațiilor și Societății Informaționale (MCSI), care era organizat prin Hotărârea de Guvern nr. 36/2017 [36]. MCSI a fost comasat în anul 2019 cu Ministerul Transporturilor, Infrastructurii și Comunicațiilor, prin intermediul Ordonanței de Urgență a Guvernului 68/2019 [37], Ordonanței de Urgență a Guvernului 90/2019 [38] și Ordonanței de Urgență a Guvernului 4/2020 [39].

Hotărârea de Guvern nr. 89/2020, prevede în art. 3, printre altele, faptul că unul dintre obiectivele principale ale Autorității pentru Digitalizarea României este acela de realizare a unei guvernări electronice la nivelul Administrației Publice de pe teritoriul României, prin operaționalizarea standardizării și realizarea unei interoperabilității de natură tehnică a sistemelor de tip informatic din cadrul administrației publice centrale, precum și implementarea principiilor din cuprinsul Declarației ministeriale de la Tallinn, din anul 2017, referitoare la guvernarea electronică. Considerăm însă, că fiecare instituție publică și UAT are o parte de responsabilitatea în ceea ce privește digitalizarea serviciilor publice pe care le furnizează și care sunt la dispoziția cetățenilor. Așa cum vom putea observa într-o secțiune următoare, la nivelul unor UAT-uri digitalizarea reprezintă un element de interes pentru conducerea locală, determinându-se astfel crearea unui smart city, care are drept consecință creșterea calității vieții și implicit a calității serviciilor publice.

Referitor la strategiile identificate la nivelul României și la nivelul Uniunii Europene, care dictează direcțiile de urmat pentru dezvoltarea digitalizării e-guvernării, cea mai importantă este *„Piața Unică Digitală pentru Europa”*. În direcția digitalizării Administrației Publice, prin intermediul acestei strategii se consideră faptul că este necesară implementarea la nivelul fiecărui stat a unei interoperabilități transfrontaliere, promovarea principiului „doar o singură dată” (care presupune că este necesar să te înregistrezi doar o dată, ulterior fiind salvate informațiile, pentru eficientizarea procedurilor), dar și extinderea de portaluri și rețele electronice și de conectarea la „portalul digital unic”[40]. O altă strategie de importanță europeană este reprezentată de *„Planul de Acțiune al UE privind guvernarea electronică 2016-*

2020. Conform prevederilor acestui plan, care în acest an ajunge la termen, era necesar ca instituţiile naţionale şi cele europene să ajungă la o eficientizare şi deschidere care să nu cunoască frontiere, oferind servicii personalizate, dar şi facile în utilizare.[41]

Un ultim element strategic, ca dimensiune europeană, pe care-l vom aborda, este *„Strategia Europeană pentru interoperabilitate şi cadrul European de interoperabilitate"*. Cum am precizat în secţiunile anterioare, interoperabilitatea este unul dintre elementele care este considerat deficitar la nivelul României, fiind apreciat ca o barieră în calea unei digitalizări eficiente. Acest cadru este însă lansat din anul 2010, fiind actualizat în anul 2017, expunându-se, în principal, necesitatea de a se crea instrumente legislative în vederea realizării acestei interoperabilităţi, dar şi promovarea unor modele de urmat în această materie, precum şi crearea unor campanii de comunicare a beneficiilor interoperabilităţii [42].

La nivel naţional, în anul 2015, prin intermediul Hotărârii de Guvern nr. 246/2015 [43] a fost aprobată Strategia Naţională privind Agenda Digitală pentru România 2020. Strategia are în vedere patru domenii de acţiune:

I. Domeniul de acţiune privind e-guvernarea, interoperabilitatea, securitate cibernetică, cloud, computing, open data, big data, media sociale.
II. Domeniul de acţiune privind TIC în educaţie, sănătate, cultură, einclusion.
III. Domeniul de acţiune privind ecommerc, cercetare-dezvoltare şi inovare în tic.
IV. Domeniul de acţiune privind broadband şi infrastructura de servicii digitale.

În cuprinsul strategiei au fost detaliate şi anumite principii în vederea realizării monitorizării şi evaluării Agendei Digitale, precum şi stabilirea unor indicatori în vederea monitorizării şi evaluării. De asemenea, a fost elaborat şi un Manual de Monitorizare şi evaluare a Strategiei Naţionale privind Agenda Digitală.

Mai mult de atât, prin intermediul Hotărârii de Guvern nr. 908/2017 [44] a fost aprobat Cadrul Naţional de Interoperabilitate. Acest cadru, are în vedere, ca principale dimensiuni, în conformitate cu punctul 1.1. din Cadru: promovarea şi furnizarea serviciilor publice de pe teritoriul României, având în vedere o dezvoltare a interoperabilităţii dintre instituţii şi sectoare, dar şi la nivel transfrontalier; ghidarea instituţiilor şi autorităţilor administraţiei publice, în vederea furnizării de servicii publice pentru cetăţeni şi mediul de afaceri.

În anul 2001, prin intermediul Hotărârii de Guvern nr. 1007/2001 [45] a fost aprobată o Strategiei a Guvernului privind informatizarea administraţiei publice. Aceasta prevedea faptul că se actualizată cu o periodicitatea de 1 an şi are în vedere câteva categorii de acţiuni, printre care informatizarea serviciilor publice şi asigurarea unui acces neîngrădit la tehnologiile informaţionale pentru cetăţeni. Însă, această strategiei n-a cunoscut o continuitate aşa cum prevede actul normativ, ci este un caz singular, până la asumarea Agendei digitale.

Cadrul legislativ naţional nu este unul foarte vast, însă actele normative relevante şi de dată recentă sunt următoarele [46]: Hotărârea de Guvern nr. 922/2010 privind organizarea şi funcţionarea Punctului de contact unic electronic [47]; Hotărârea de Guvern nr. 1235/2010 privind aprobarea realizării Sistemului naţional electronic de plată a taxelor şi impozitelor utilizând cardul bancar, cu modificările şi completările ulterioare [48]; Hotărârea de Guvern nr. 64/2011

pentru aprobarea Metodologiei cu privire la aplicarea unitară a dispoziţiilor în materie de stare civilă [49], Ordonanţa de Urgenţă a Guvernului nr. 111/2011 privind comunicaţiile electronice, cu modificările şi completările ulterioare [50]; Hotărârea de Guvern nr. 414/2015 privind aprobarea programului pentru implementarea Planului Naţional de Dezvoltare a Infrastructurii [51]; Hotărârea de Guvern nr. 908/2017 privind aprobarea Cadrului Naţional de Interoperabilitate [52]; Hotărârea de Guvern nr. 89/2020 privind organizarea Autorităţii pentru Digitalizarea României [53], Ordonanţa de Urgenţă a Guvernului nr. 38/2020 privind utilizarea înscrisurilor în formă electronică la nivelul autorităţilor şi instituţiilor publice [54]; Ordonanţa de Urgenţă a Guvernului nr. 29/2020 pentru completarea Legii nr. 455/2011 privind semnătura electronică [55].

La nivelul actelor normative de natură europeană, directivele şi regulamentele cele mai recente şi apreciate ca fiind de o relevanţă aparte sunt [56]: Regulamentul 2016/679 privind protecţia persoanelor fizice în ceea ce priveşte prelucrarea datelor cu caracter personal şi privind libera circulaţie a acestor date şi de abrogare a Directivei 95/46/CE; Directiva 202/508/CE asupra confidenţialităţii şi comunicaţiilor electronice; Directiva 2019/1024 a P.E. şi Consiliului privind datele deschise şi reutilizarea informaţiilor din sectorul public; Regulamentul U.E. 2018/1724 al P.E. şi Consiliului privind înfiinţarea unui portal digital unic în vederea oferirii de acces la proceduri şi servicii de asistenţă în soluţionarea problemelor; Regulamentul U.E. 2019/1157 al P.E. şi al Consiliului privind consolidarea securităţii cărţilor de identitate ale Cetăţenilor Uniunii europene şi a documentelor de şedere eliberate cetăţenilor şi familiilor acestora care îşi exercită dreptul la liberă circulaţie.

4. Direcţii de acţiune

Conform unui *Studiu privind implementarea guvernării digitale în România* [57], alte ţări au luat măsuri privind implementarea: identităţii electronice; semnăturii digitale; unei parole unice de identificare; sistemelor digitale privind incluziunea socială; înregistrării online a companiilor; depunerii online a declaraţiilor fiscale şi a vizualizării a informaţiilor în acest sens. În plus, a fost adaptat cadrul legislativ, a fost implementată o bază de date comună tuturor instituţiilor publice (cu posibilitatea de oferire a unui feedback din partea utilizatorilor în ceea ce priveşte corectitudinea datelor), s-au alocat resurse pentru creşterea gradului de educare digitală, au fost încheiate convenţii pentru optimizarea relaţionării dintre organizaţiile private şi cele publice şi au fost transpune în mediul online aplicaţii care să faciliteze accesul la servicii financiare, medicale, de transport, imobiliare, sociale etc (e-tax, istoric medical etc).

De exemplu, conform aceluiaşi studiu, mai sus menţionat, Danemarca este apreciată ca fiind lider în materie de digitalizare la nivel european, acest aspect fiind de actualitate şi în prezent. Aceasta a reuşit atât implementarea unor servicii digitale, cât şi stimularea cetăţenilor în vederea utilizării lor. În acest sens, a fost necesară promovarea beneficiilor pe care soluţiile digitale le implică. Astfel, într-o primă etapă, Danemarca a impus facturarea electronică pentru companii, crearea

unui cont bancar de către persoanele fizice şi juridice, cât şi utilizarea acestui cont pentru toate plăţile în raport cu instituţiile publice. De asemenea, au urmat: elaborarea legislaţiei necesare impunerii respectării iniţiativelor în domeniul digitalizării; digitalizarea serviciului de raportare a obligaţiilor financiare a celor din mediul de business, având peste 200 de formulare disponibile online; implementarea paşaportului electronic (având un cip care conţine informaţii referitoare la identitatea persoanei); elaborarea unui program dedicat schimbului de know-how [58] dedicat cetăţenilor, în cadrul căruia experţii le pot pune la dispoziţie materiale didactice cu scopul consolidării cunoştinţelor în materie de tehnologie; introducerea semnăturii digitale etc.

Un alt exemplu relevant în materie, este cazul Estoniei, considerată un model de bună practică, mai ales în ceea ce priveşte e-guvernarea şi democraţia digitală, chiar dacă nu deţine un loc fruntaş, aşa cum arată studiile analizate în secţiunea precedentă, se situează în topul primelor zece ţări digitalizate. În cazul acesteia, 95% din declaraţiile fiscale se depuneau în mod electronic, în anul 2015, 95% dintre medicamente erau achiziţionate în baza unei reţete digitale, iar 30% din numărul de voturi au fost exprimate în mod online la alegerile europene, naţionale şi locale. Pentru a spori încrederea cetăţenilor faţă de serviciile digitale, un merit deosebit îl au instituţiile bancare care au investit în promovarea beneficiilor utilizării mediului online, cât şi în oferirea unor servicii înalt calitative. De asemenea, şi în cazul Estoniei, cadrul legislativ a avut un rol esenţial, iar acesta, alături de buna relaţionare dintre autorităţi, reprezentanţii aleşi şi funcţionarii publici, au condus la implementarea cu succes a guvernării digitale. Estonia prevede încă din anul 2000 depunerea electronică a anumitor declaraţii fiscale şi o aplicaţie de plată online a parcării. De altfel, în perioada 2002-2014 au fost dezvoltate servicii digitale care să permită realizarea formalităţilor necesare deducerii taxelor, depunerii cererilor şi rambursarea TVA-ului; a fost dezvoltat un parteneriat public-privat care să satisfacă nevoia de instruire a populaţiei în domeniul noilor tehnologii; a fost generat un mediu virtual, o aplicaţie, de comunicare între studenţi, cadre didactice, părinţi şi administraţiile şcolare; a fost creat un portal care să permită înfiinţarea online a unei societăţi comerciale; au dezvoltat o bază de date, şi o interfaţă specifică acesteia, în materii de istoric medical al unui pacient; au implementat un ID card şi semnătura electronică etc.

În ceea ce priveşte cazul României, printre exemplele de bună practică întâlnite la nivel naţional putem menţiona includerea posturilor vacante din administraţia publică pe o platformă online (www.posturi.gov.ro), serviciile online oferite de *Oficiul Naţional a Registrului Comerţului* mediului de afaceri, posibilitatea de a solicita online Ministerului Afacerilor Externe eliberarea vizei necesare intrării în România (eviza.mae.ro), sistemul electronic de achiziţii publice (SEAP - www.e-licitatie.ro), platforma destinată plăţilor taxelor şi impozitelor (www.ghiseul.ro). De asemenea, accesând Sistemul Electronic Naţional (www.e-guvernare.ro), avem acces permanent şi nelimitat la informaţii specifice unor servicii publice online, precum: eliberarea autorizaţiilor de transport, plata online a taxelor, obţinerea unei cărţi funciare, portalul european în domeniul justiţiei etc. În plus, a fost dezvoltată o platformă online, *Punctul unic de contact electronic* (edirect.e-guvernare.ro), aceasta

fiind gândită ca un catalog unic al serviciilor publice care să ofere informaţii în ceea ce priveşte informaţiile şi procedurile de accesare a unui anumit serviciu, documentaţia necesară, timpul mediu de soluţionare, legislaţia în vigoare în domeniul respectiv etc. [59]

Prin raportare la măsurile implementate la nivel european, pentru a dezvolta servicii publice digitale calitative, printre priorităţile guvernanţilor trebuie să se regăsească puncte precum: stabilirea unei autorităţi responsabile în acest sens; dezvoltarea unui plan de acţiune pe termen lung; remedierea legislaţiei naţionale astfel încât să faciliteze dezvoltarea serviciilor digitale şi utilizarea acestora de către beneficiari; încheierea de convenţii între entităţile publice şi private în vederea optimizării schimbului de informaţii; transpunerea în mediul online a cât mai multor servicii publice (achiziţii publice, plata taxelor şi impozitelor, înregistrarea societăţilor comerciale etc); îmbunătăţirea programei şcolare cu privire la materiile care vizează dezvoltarea de competenţe digitale; dezvoltarea parteneriatelor public-privat astfel încât mediul de afaceri să fie implicat în transpunerea în practică a iniţiativelor de digitalizare; atragerea de fonduri pentru dezvoltarea infrastructurii tehnologice necesare; implementarea unor baze de date comune la care să aibă acces instituţiile statului; măsuri de educare a populaţiei atât privind utilizarea noilor tehnologii, cât şi în vederea asigurării siguranţei utilizării unor astfel de servicii. Astfel de măsuri vor facilita accesul cetăţenilor la serviciile publice şi vor contribui la creşterea gradului de încredere şi satisfacţie faţă de autorităţile publice. [60]

5. Concluzii şi consideraţii finale

Această lucrare pune în evidenţă necesitatea digitalizării serviciilor publice şi beneficiile pe care acest proces le presupune. În această direcţie, putem menţiona îmbunătăţirea calităţii serviciilor furnizate prin creşterea transparenţei, eficienţei şi eficacităţii, reducerea timpului necesar accesării unui serviciu, reducerea birocraţiei, scăderea evaziunii fiscale, diminuarea costurilor, responsabilizarea autorităţilor şi facilitarea comunicării interinstituţionale şi comunicării dintre autorităţi şi cetăţeni etc. Autorităţile trebuie să prioritizeze generarea unui plan de acţiune pe termen lung privind digitalizarea administraţiei, iar pentru a putea fi fiabile soluţiile propuse, este necesară pregătirea populaţiei prin educarea asupra utilizării noilor tehnologii şi asupra securităţii informatice, astfel încât să crească gradul de încredere faţă de utilizarea internetului în rezolvarea unor chestiuni de natură administrativă.

Elementele şi cercetările care au fundamentat prezentul studiu, au menirea de a încerca să ne contureze o perspectivă, ancorată în realitate, cu privire la nivelul de digitalizare al instituţiilor publice din România. În încercarea de a prefigura un răspuns cât mai pragmatic cu privire la chestiunea digitalizării administraţiei publice, am identificat şi analizat studii empirice relevante în materia e-guvernării, iar astfel putem concluziona că deşi România a evoluat în ultimii ani în dezvoltarea serviciilor publice digitale, aceasta nu se aliniază standardelor internaţionale şi

europene, regăsindu-se pe ultimele poziţii în cadrul clasamentelor mai sus menţionate.

Această poziţie a României, nu poate fi apreciată ca fiind favorabilă, dat fiind faptul că prezintă un slab nivel al digitalizării, în raport cu alte state ale Uniunii Europene. Acest fapt determină o lipsă a răspunsului decidenţilor faţă de exigenţele actualului context, atât naţional, cât şi european. Apreciem, că un stat care pretinde a fi mereu conectat la necesităţile cetăţenilor, trebuie să aibă un dezvoltat interes şi faţă de noile tehnologii. Cu atât mai mult, apreciem faptul că în cadrul stabilirii liniilor de guvernare, digitalizarea Administraţiei Publice trebuie să reprezinte un punct primordial. Pe de altă parte, administraţiile publice de la nivel local, trebuie să înţeleagă necesitatea cristalizării unor măsuri care să determine dezvoltarea unui smart city, cetăţenii având nevoie de astfel de soluţii, pragmatice, facile şi inovatoare.

În ceea ce priveşte strategiile identificate la nivel naţional, se constată o carenţă în acest domeniu. În afara Strategiei privind Agenda digitală a României, care anul acesta (2020) ajunge la termen, nu mai pot fi identificate strategii de actualitate, care să dicteze direcţiile de urmat pentru viitoarele guverne şi instituţii ale administraţiei publice, locale şi centrale. Apreciem faptul că astfel de măsuri sunt necesare, pentru a reprezenta un punct care să determine acţiuni concrete, cu asumarea unei targhetări la nivel ridicat, şi cu intensificarea acţiunilor privind serviciile publice electronice, toate acestea în vederea îmbunătăţirii activităţilor, având ca o consecinţă directă creşterea calităţii vieţii, precum şi alinierea României în rând cu ţările pentru care digitalizarea reprezintă un focus. În acest proces, fiecare entitate statală, va trebui să aibă un rol bine determinat, în vederea consolidării întregului demers [61]. Legislaţia naţională trebuie aliniată celei regăsite la nivel european, iar, în aprecierea noastră, modelele de bună practică, precum cele prezentate pe parcursul acestei lucrări, pot fi luate drept puncte de referinţă în elaborarea strategiilor şi în trasarea direcţiilor de e-guvernare.

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Fog Computing: Modeling the future of smart cities

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Abstract

IoT is one of the most impactful technologies in recent years and is the cornerstone of Smart Cities. IoT solutions benefit from Cloud Computing services through scalability, performance and through data sent from millions of interconnected devices and sensors in a city. To mitigate risks, secure architectures have been developed in recent years, but a major issue identified using Cloud technology is the concentration of large amounts of sensitive data and the large number of security solutions that need to be managed. Regarding this, a new emerging technology, Fog Computing, is presenting many solutions to solve some of the limitations of the Cloud by bringing the processing of data closer to the edge.

A Fog Computing model not only offers low latency transmission, power efficiency and great bandwith, but also makes vulnerable edge devices and sensors more secure. The aim and objective of the article is to present a Fog Computing model with 2 main directions in developing this concept: data-as-a-service (DaaS) and security-as-a-service (SaaS) and an analysis of the security improvements that Fog Computing can bring to an IoT network (Fog

Computing over Cloud Computing). Fog Computing and its impact on IoT technologies is a new research topic regarding the performance and resilience of a smart city. But there are also cyber security concerns, such as the threat of cyber attacks (DDoS, hijacking, APTs, etc) and risks related to the safety of sensitive data transiting IoT networks. The paper was constructed on secondary research published by companies, researchers and public institutions.
Smart Security is a crucial concern for a Smart City's infrastructure and to the privacy of its citizens. Fog Computing can solve some of Cloud Computing's security limitations and can make major improvements in the reliability and resilience of security systems, but also in the efficiency of data processing and secure assets capabilities.

Keywords: *smart security, edge computing, IoT, smart data, cyber security.*

1. Introduction

IoT is the technology that allowed the concept of Smart Cities to take shape and develop more and more throughout the years, taking new and diverse challenges, on different layers. It isn't surprising that the revolutionary invention of Internet would lead someday to a world of interconnected devices that communicate data in real time with each other. Becoming popular around the year 2011, IoT implementation in the development strategies of cities opened a door to a world of infinite possibilities, imagination being probably the biggest challenge facing IoT engineers, but also governments and businesses. The advantages that IoT offers, such as managing and monitoring many activities in the same time made people realize the huge financial benefits of implementing such technologies in a city, being able to save time and human resources, but also gain new insights from the data gathered for future planning on tasks such as: traffic management, pollution reduction, improving infrastructure and keeping citizens safe.

Even if the technology started being widely implemented recently, the technology and concept aren't new to us. The term *Internet of Things* was coined by Kevin Ashton in 1999 and the idea of devices connected and controlled over the Internet has already took shape in the 1980s [1]. The IoT industry keeps growing and the industry's global worth is considered to be more than 200 Billion U.S. dollars and there are more than 50 billion IoT devices in the world [2]. The idea that any physical object can be transformed into an IoT device, the continuous fall in the price of adding sensors and an internet connection to devices and the need for an interconnected world will keep the IoT industry's exponential growth.

IoT networks are comprised of millions of interconnected devices with sensors and actuators, that constantly send vast amounts of data. The „cloud" is responsible with processing, analyzing and storing data sent by IoT devices and is an inalienable piece in the architecture of an IoT network due to several advantages such as interoperability, scalability, processing and storage power. Yet, in recent years, people realized that cloud computing has several limitations when it comes to cyber attacks, speed, reliability on internet, downtime issues, etc. The term "fog

computing" was coined by Cisco and is in reference to an extension of cloud computing to the edge of the network. By bringing the functionalities of the cloud closer to the edge, fog computing redefines the architecture of the IoT network, creating opportunities for new technologies to be effectively implemented and improving the overall sustainability and security of the network through low latency, high response time, decentralization or location awareness.

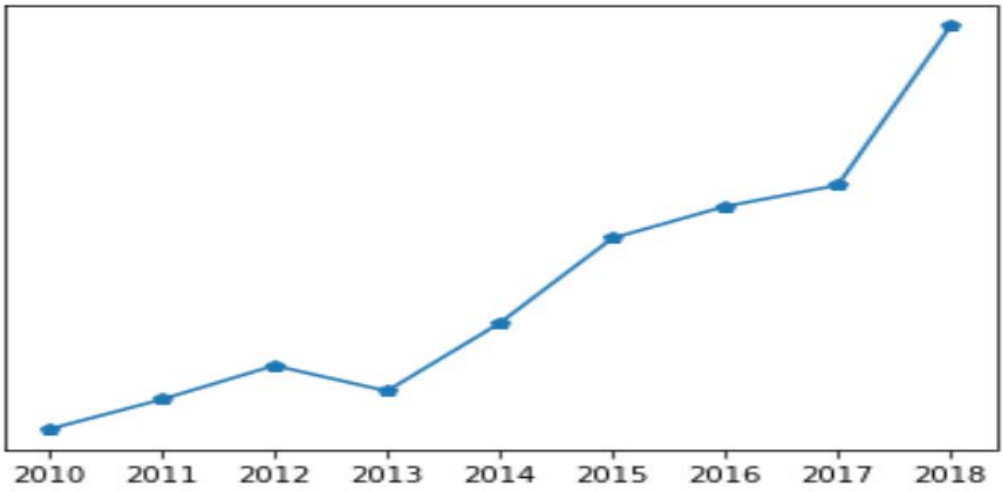


Fig. 1. Trend of vulnerabilities affecting manufacturing-related equipment reported to the industrial Control System Computer Emergency Response Team (ICS-CERT)
Source: [3]

Fundamentally, every new device added to an IoT ecosystem adds a new attack surface or opportunity for malicious attacks. Taking in consideration that an IoT network can be targeted by many attackers in different layers of its architecture and the fact that IoT is the backbone of a Smart City, it is important to consider Smart Security a crucial part in the development plan. Vast amounts of sensitive data are transmitted non-stop in the network, the privacy of the users and security of the data should be the main concerns of a Smart City. The IoT network must be trustworthy in face of different attacks, such as: APTs (advanced persistent threats), data and identity theft, device hijacking, DDoS attacks, Credential theft, etc. If we consider that a cyber attack can disrupt a whole industry and threaten the safety and privacy of citizens, we realize that Smart Security is one of the most important aspects when it comes to the reliability and survival of the Smart Cities' concept in the future.

2. Cloud computing

The "heart" of the IoT network is composed of all the sensors, actuators and identification technologies, such as RFID and Wireless Sensor Networks, used in IoT devices to gather and transmit data through the network. The network is similar to the blood vessels in the human body and it's responsible for the fast, efficient and

secure transmission of data [4]. The "brain" of the IoT architecture is the place where we can store, process and analyze all the data sent by the end devices effectively, at the moment Cloud Computing being the most popular technology. The computing is the most important aspect of an IoT network, the cloud being able to identify the useful information contained in the data sent by the millions of sensors interconnected in the network, store the information and share it over the cloud platform between a number of interconnected servers. Cloud Computing has many advantages that go hand in hand with the nature of IoT networks being centralized, easily scalable, cheap and offering a vast amount of services.

Cloud computing architecture can be broken down in three cloud computing layers/models: Infrastructure-as-a-Service that "provides infrastructure like unlimited storage and computing power for developers without requiring any physical hardware on site", Platform-as-a-Service that "includes resources like operating system, programming language, database, web server that automatically scales to meet the application demands" and lastly Software-as-a-Service which is the "top layer and most basic form of cloud computing, where the software and associated data are deployed and hosted on the internet which is accessed by the user via a web browser" [5]. This makes Cloud Computing very flexible, being able to be used in more or less complex applications by users.

Taking in consideration the immense size of the IoT architecture and the vast amounts of data that must pe processed, Cloud computing is a service that allows companies and users to avoid the cost and complexity of owning and maintaining their own IT infrastructure, by having access to storage, networking or processing power offered by the cloud service provider. The concept of cloud refers to the idea that the location of the service and other details such as hardware or software behind it are mostly irrelevant to the user, the cloud being able to manage the storage, networking and processing tasks demanded by the IoT network.

Cloud Computing provides huge cost savings for small and large companies when it comes to certain IT infrastructure requirements. The Cloud offers storage capabilities and computing capabilities to all the information sent by the different connected machines that are communicating, with easy implementation and no hardware required. The cloud can process data fast and assist decision support functions for the networking architecture, in this way time wasted on redundant data and other unexpected events can be reduced[6]. The stored data can be easily accessed, through cloud services, and has built in recovery capabilities. This makes an IoT architecture using Cloud Computing a centralized architecture, sending the data and processing of data away from the user and abandoning most of the front-end heavy processing.

Another big advantage of the Cloud is the pay-as-you-go nature. In the context of IoT networks where more and more data are sent to the cloud as number of devices increases, this payment method for cloud charges based on the data usage, offering more control over the costs of a certain project and scalability.

With all the above in mind, some of the biggest advantages of Cloud Computing present great risks and limitation. With different companies providing different services and devices for an IoT network, there is a need for standardized

interfaces and standardized APIs for cloud services. SaaS applications suffer the most from this challenge of switching between applications, sometimes involving a change in the interface [7].

Another problem for Cloud Computing represents its dependency on internet connection, need high bandwidth to be performant, the risk of technical outages, limited control over business assets because of remote servers and vendor relationship management. Besides all of these technical disadvantages, cloud computing is vulnerable to cyber attacks too. The cloud handles big amounts of sensitive information about people, companies or government, so it becomes a target for hackers. From concerns such as the risk of data confidentiality (other people may have access to the data) to APTs, device hijacking, credential theft, etc.

Even if developers have come with many solutions such as encrypting the data, a strong security platform and a multi-environment support, the technology of the cloud is not enough unfortunately to efficiently fight all the attacks because the distance from the end device and centralized nature of the cloud makes the network vulnerable to attacks on different layers and connection devices, the difficult mitigation of SaaS and IaaS application, the fact that data from millions of devices is processed in a single area of the network makes it easier to target a wider area of network attack.

3. Fog computing

In response to the challenges faced by the Cloud Computing technology, a new concept named Edge Computing emerged, trying to solve some of the performance and security limitations of the cloud architecture. Edge computing is a concept that refers to moving the computation power of an IoT network to the edge of the architecture, directly on the device. The key difference between cloud and edge computing is the location in the network where data is processed, analyzed and stored. Fog computing is the standard that defines how edge computing should work. It uses the edge computing activities to the processors that are connected to the LAN making it a little farther from the sensors and actuators.

"Fog computing is generally considered as a non-trivial extension of cloud computing from the core network to the edge network" [8] and can also be considered the real implementation of the Edge computing technology. Following the trend of bringing computation closer to the edge of the network and making it decentralized, fog computing can definitely solve and improve on some of the limitation of cloud computing while giving up on some other functionalities such as access on spot to big datasets, interconnectivity between servers and user authorization. Fog computing can be found in the IoT architecture between the end device and cloud, bringing the services closer to the device than the cloud.

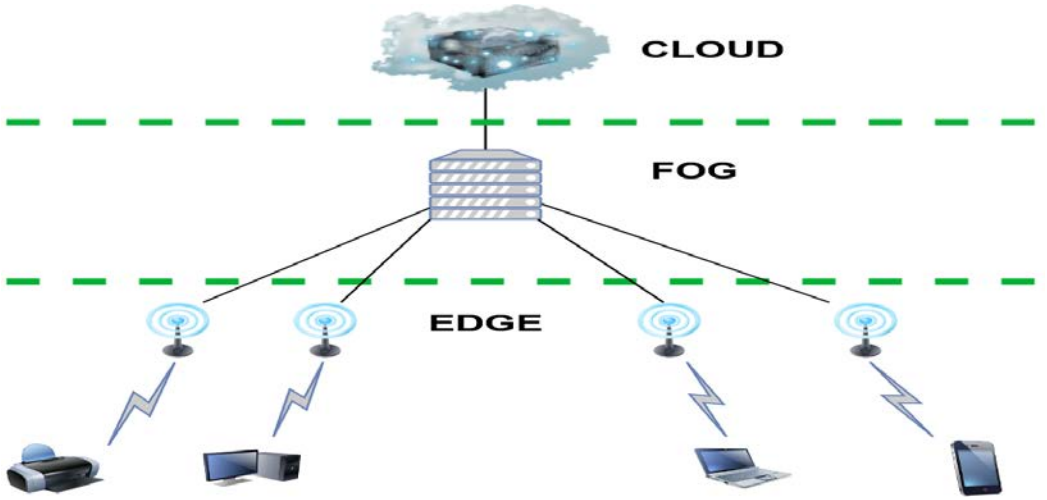
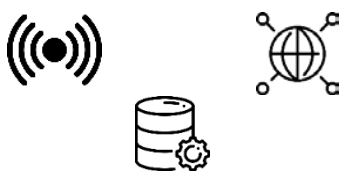


Fig. 2. Relationship between cloud and fog computing

Fog computing has a big range of applications and comes with a very large contribution in the development of smart cities. Most important examples are Smart Vehicles (with light scheduling, congestion mitigation, parking facility management), Health Data Management (patients can take possession of their own health data locally, reducing the risks of GDPR violation), Smart Grid. The smart grid is an electricity distribution network based on smart meters that measures the real-time status information. That information is centralized by a server called SCADA which sends commands to respond to any demand change or emergency to stabilize the power grid. Fog computing can make from SCADA a "decentralized model with micro-grids with a better cost, scalability, security, which can also integrate power generators with main power grid."[8]

In terms of performance, fog computing is superior to cloud computing when it comes to low latency and high response times, thanks to the wide spread topology of the network. Also, the decentralized nature of the fog lowers the bandwidth requirements, as some of the requests are solved close to the edge, while the more demanding ones are sent to the cloud. The decentralization and distribution also make it better in terms of mobility, taking in consideration the inexpensive, flexible and portable deployment in terms of both hardware and software and are able to process data from a diverse set of devices.

Fog computing provides location awareness in comparison with cloud computing where everything is based on Internet and the location of the servers is unknown, this resulting in better supporting capabilities for the large number of servers in the network.



The fact that data is analyzed and stored in the local network makes fog computing incredibly stable in stressful situations compared to the cloud and a lot more reliable in real time applications such as autonomous vehicles because of the need of fast responses from the network.

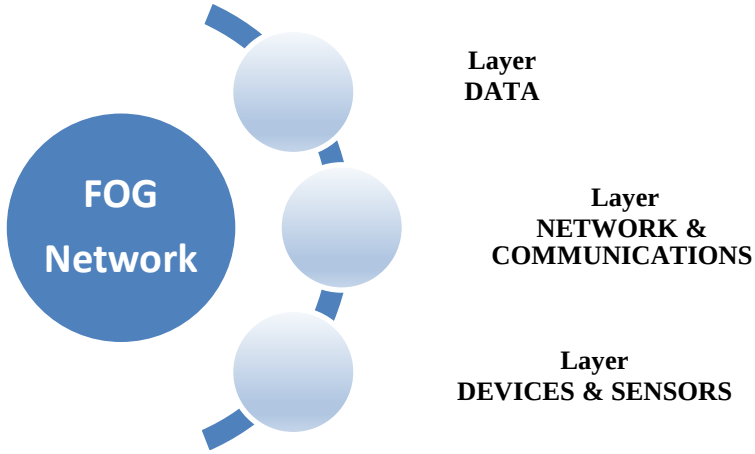


Fig. 3. Fog computing layers

Fog computing implementation can greatly improve IoT networks when it comes to security of data, as less sensitive data is sent to the cloud to be stored or analyzed. "Edge computing is the least vulnerable form of decentralized storage. On the cloud, data is distributed to dozens of servers, whereas edge computing uses hundreds, possibly thousands of local nodes. Each device can act as a server in the edge network.

To break into, hackers would need access to thousands of distributed devices, which is practically impossible"[9]. The fact that fog computing are placed to the edge, means they'll have rich and heterogeneous end-user support, being another layer of security in the IoT network. Also the fact that there should be a single hop between end devices and the fog, means there is less space for attacks in the network. "Fog computing has all applicable security controls and processes in place which solves the problems of security risks and mitigate the threads" [10].

Cloud can store much more data than a fog system and can aim for long-term deep analysis, while fog performs short-term edge analysis due to almost instant responsiveness. „A report by Verizon discovered that instances with little data losses (around 100 lost or compromised record) costs an average of 18,120 to 35,740 $, while large-scale data loss costs an average of 5 to 15.6 million $". When taking in consideration the real cost of data loss, fog computing's implementation costs start looking more and more appealing.

Table 1. Cloud and Fog Computing: a Comparison Chart

	CLOUD	FOG
Architecture	Centralized	Distributed
Communication with devices	From a distance	Directly from edge
Data processing	Far from the source of information	Close to the source of information
Computing capabilities	Higher	Lower
Number of nodes	Few	Very large
Analysis	Long-term	Short-term
Latency	Higher	Lower
Connectivity	Internet	Various protocols and standards
Security	Lower	Higher

Source: *sam-solutions.com - Fog Computing vs. Cloud Computing for IoT Projects*

Disadvantages of fog computing are the higher cost of implementation because devices like hubs, routers, gateways are necessary, they have less computational resources than cloud servers and there is the challenge of maintaining so many local servers in the network. Fog computing isn't meant to replace cloud computing, but work together with it, creating a more stable and resilient IoT infrastructure.

4. Security model for IoT networks with fog computing

Our research is focus on implementation of a security validation model that revolves around the 3 main attributes of any secure system: integrity, confidentiality and availability. STRIDE[11] is a model of threats implemented to help consider and identify potential threats to a system.

Table 2. Impact on CIA Triade by the main threats(STRIDE methodology)

Fog Layer	THREAT	Impact on CIA Triade		
		Confidentiality	Integrity	Availability
Devices & sensors	Spoofing	major	minor	none
	Tampering	none	major	none
	Repudiation	none	major	none
	Information disclosure	major	none	none
	Denial of service	none	none	major
	Elevation of Privilege	major	major	none
Data layer	Spoofing	major	minor	none
	Tampering	none	major	none
	Repudiation	none	major	none
	Information disclosure	major	none	none
	Denial of service	none	none	major
	Elevation of Privilege	major	major	none
Network & communications	Spoofing	major	minor	none
	Tampering	none	major	none
	Repudiation	none	major	none
	Information disclosure	major	major	none
	Denial of service	none	none	major
	Elevation of Privilege	major	major	major

A bidirectional communication between the fog - end devices and the fog - cloud that enables real time analysis of the network's state, so the fog network can change between different levels of security in each node.

If a fog node is compromised/affected, neighbouring fog nodes can increase the level of security in order to detect attacks. This can be realized with the cloud that analyze the state of the fog network and send reports back to each node, after that the fog node analyzes the cloud report and takes the needed measure.

By creating a fog framework where each node adapts to realtime necesities such as security over computing or vice versa, we create a dynamic system that is cost effective and more reliable. We consider it hard to attack the whole Fog layer due to the big number of heterogenous nodes, so it is easier to locate and solve attacks earlier through the reports.

Fog computing allows for malware and infected files to be found at an early stage in their cycles at the device level long before they even have the opportunity to infect the whole network because a fog node can allow operations managers to remotely isolate and shutter the zone that is infected keeping disruption to a minimum. During an attack, fog nodes are operating using only their local intelligence and locally stored data to manage permissions and data accessibility of the system.

Model that creates a platform for the fortification of security in IoT networks and that can be applied in different economics sectors such as healthcare, transport, banking, energy or surveillance. We take in consideration the impact that fog computing implementation has on the IoT network and cloud in both functioning state and also compromised state, having the goal to minimize data loss and to make even more resilient systems to attack. The fog nodes in the model act as gates that moderate the ratio of resources allocation to security and computing through several reports from the cloud and other nodes in the fog, taking in consideration different applications and their necessities.

We imagine a strongly communicative network that has constant knowledge about the other nodes in the fog so it can effectively take measures in case of emergencies. Each node in the fog sends key information about the state they are in and after processing all the data from the nodes, a global report is sent back to each fog node so it can take security measures in response to the report (increase the level of security if the close nodes of an attacked node for example). This report and respond system enforces the need of a fog computing platform that can support different applications implemented by multiple independent data providers.

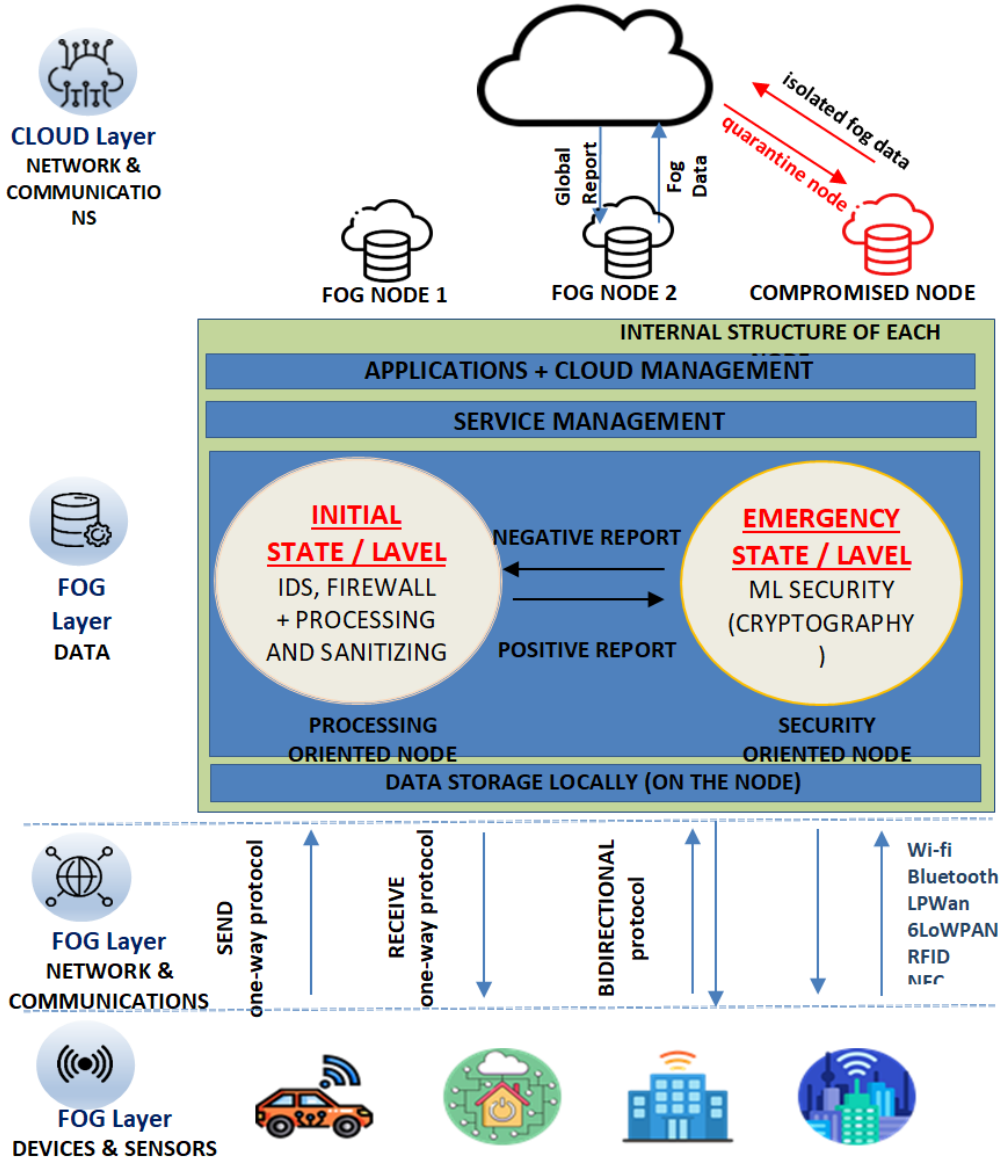


Fig. 4. Security Model for IoT Networks with Fog Computing

Taking in consideration good practice implementations present in any security system we can apply fog computing in:

- ***Real Time Alerts***: With fog computing, we can concentrate on key access points in a network where most sensitive data is(through risk assessment) and fortify the security on those points mananging real time alerts.
- ***Data Minimization and storage in multiple locations***: spread small amounts of data in several fog nods, so it's harder to target and attack big datasets. Less demanding tasks processed by the fog, while the others go to

the cloud. The less time data spends traveling in the network, the smaller the chance for it to be lost.

- ***Continuous monitoring***: fog nodes that continuously monitor and signal security problems using multiple levels of security based on the reported state of the network. Cryptography is a compute intensive process and it depends a lot on the cryptographic abilities of the IoT devices.

Different economic sectors such as transportation[12], healthcare[13] or banking demand high security by default because of the sensitive data used and the human safety implications of autonomous driving for example, while other domains such as energy or surveillance can be implemented with increasing levels of security depending on the state of the network(if it's attacked or not) so it can channel the computing power of the fog node to other tasks.

This way, we realize a model where we constantly monitor the state of the other close nodes in the fog or the state of the cloud and increase the level of security only in case of emergency. This way we efficiently concentrate the limited computing resources of each node in most of the cases so we can improve performance of the IoT network, making the fog a triage layer for data that should be sent to the cloud for the hardware and software demanding tasks.

In normal states, the IoT architecture is not unprotected because the fog layer automatically improves security of the network if we implement the fog as proxy server with Intrusion Detection Systems and/or firewall capabilities. With this, most of the attacks can be prevented by the firewall and harmful intrusion attempts can be detected by IDS and mitigated in the fog, not even reaching the cloud that has its own security services too.

In the case of services that require authentication, if several layered authentication methodology (one at FCG, one at the cloud, etc.) is used then this might be a very secure solution. Otherwise, if all authentication operation is left to the FCG devices, this might create problems when the FCG devices get compromised. Any failure in security would only affect a limited number of IoT devices connected to the respective fog node/nodes, while the cloud would remain mostly unaffected and functional so it can start solving the problem.

No system is invincible and perfectly secure and with so many heterogenous devices working together constantly, there will always be vulnerabilities that can be exploited, the main goal being the minimization of damage.

If we extend the topic to confidentiality which is crucial in healthcare, a suggestion would be the storage of private data on the edge while sending just the necessary data on the cloud. This way, data would be spread and it would be harder to affect the overall integrity of the system. In case of compromise, the other nodes would receive a report of the affected node's state and would implement a higher level of security, giving up on the processing power of data.

Also, when a node is compromised, the system should "quarantine" that node until the problem is solved. Yet this thing would render the devices connected to the node non functional, raising the question: what's the impact of a compromised fog node? In most cases, the IoT end devices suffer the most while the cloud can be unaffected by breaking the connection with that node when danger is detected.

Having just as few nodes compromised as possible is absolutely necessary and can be realized with a multiple levels of security system that increases cryptography and the "defenses" in the other nodes of the network when a fog node was compromised.

In the case of compromising a few nodes of the fog in comparison with the huge servers of the cloud, we reduce the losses by a lot. On the other hand, compromising a fog node can mean the hijacking of an autonomous car which can lead to devastating consequences so that's why we need to have a high level of security implemented for the get-go on this type of applications.

This way we divide fog nodes in two categories: security dominant nodes and processing dominant nodes. In security dominant nodes, applications that include the use of private/confidential data or that could lead to the endangerment of people should allocate most of their resources on security services while the processing dominant nodes would concentrate on the sanitizing of the network – preprocessing of data and getting rid of unnecessary data that would uselessly flood the cloud, with a changeable level of security depending on the state of the nodes in the fog/cloud network.

In cases where both the processing and security are highly needed like in the case of autonomous vehicles that need very fast response times and good security, servers with greater computing capabilities need to be implemented in the fog in combination with the already powerful machines in the cloud.

5. Conclusion

Taking in consideration that an IoT network can be targeted by many attackers in different layers of its architecture and the fact that IoT is the backbone of a Smart City, it is important to consider Smart Security a crucial part in the development plan. Vast amounts of sensitive data are transmitted non-stop in the network, the privacy of the users and security of the data should be the main concerns of a Smart City.

Using unidirectional data transmition protocols (dioda), separating devices and sensors into dedicated nodes according to the described security model can ensure much higher security for IoT networks. The usefulness of such a conceptual model can reduce the attack surface, reduce the vectors and possible attack scenarios by adding a cybersecurity component to the local nodes in fog computing

The IoT network must be trustworthy in face of different attacks, such as: APTs (advanced persistent threats), data and identity theft, device hijacking, DDoS attacks, Credential theft, etc. If we think that a cyber attack can disrupt, in a moment, a whole industry and threaten the safety of citizens and their privacy, Smart Security becomes one of the most important aspects when it comes to the reliability and survival in the future of the concept of Smart Cities.

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Improving risk management in (SMEs) insurance companies and adapting them to the Corona crisis

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Abstract

The organizations' interest is to avoid the failure and collapse by keeping up with technological Improving risk management is important for insurance companies (SMEs) because it improves technology recognition, measurement, and risk handling, even with the continuous development in technology, risk management has become a state of uncertainty that we can measure through knowing the potential losses and gains, trying to reduce losses and trying to increase the gains, Which leads to more adaptation to technological development. Through "The Impact of Uncertainty on Objectives" that illustrates the lack of future information [1]. The SMEs insurers companies face many risks as the continued survival of small enterprises with low financial and non-financial resources are highly vulnerable to threats [2]. The use of a scientifically descriptive-analytical approach shows how insurance companies (SMEs) deal with the threat of the Coronavirus and how their risk management has evolved to confront Virus Corona using technology. The results show a statistically significant relationship, whether between risk management and keeping pace with technological development or between applying risk management steps. The results are expected to help increase the SMEs insurance companies' knowledge of the concepts of risk, risk management, and insurance industries, and increase business performance, evaluate and discuss the concepts and steps of risk management and link them to the sector practical results.The conclusion is that applying risk management steps and keeping pace with technological development reduces all risks, helps the institution to sustain itself, and helps the economy to develop.

Keywords*: risk management, insurance industries, New Firms • Startups.*

Jel: *G32, G22, M13.*

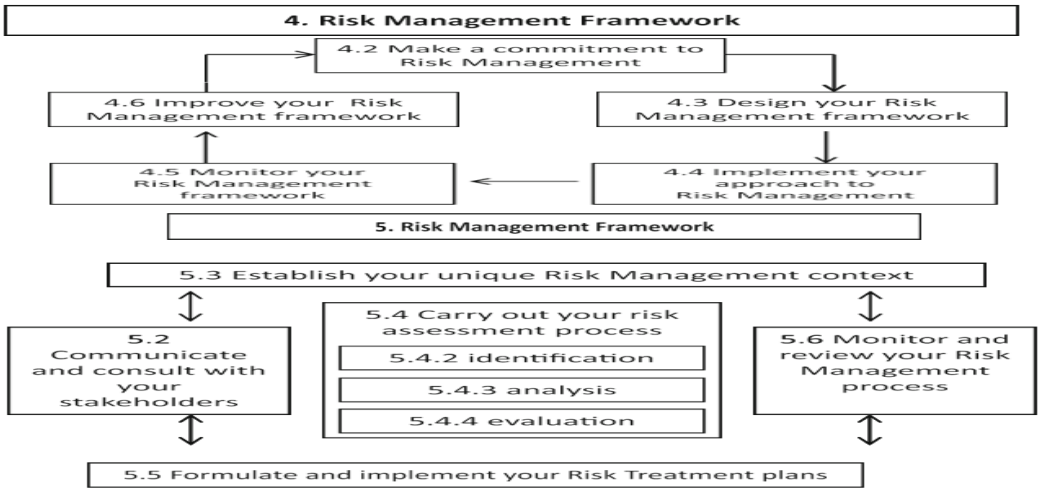
1. Introduction

The first person to define the risk process was the scientist Smith, who defined it as (uncertainty) in (1776) and it was expressed on the basis of the infrequent event, although he did not realize what the risks were in his study. Therefore, the business field is determined by identifying the techniques and procedures for identifying, measuring and treating risks in business decisions, and here was the beginning to plan the risk situation, after that a group of scholars during that period from 1900-1940 identified risks such as (Willet) in (1901) and (Leitner) in (1915) all the way to (sasii) in (1940) where risk was dealt with on the basis that it is a measurable uncertainty and not an immeasurable uncertainty until 1979 when Borghesl explained the concept of uncertainty such as "lack of information about A procedure from a study of the constraint of the system "As it may also be known, a risk can be a cause or source of an unfavorable event, or situations that create or increase the likelihood of an event unfavorable to something related to a particular risk [1].

Insurance companies seek to avoid failure and collapse by improving risk management, as they work to control risks by increasing the effectiveness of management, [3] but with the continuous emergence and spread of new risks, the need to overcome these threats and turn them into opportunities has increased. For the future, the organization should work to manage different types of risks through a comprehensive approach [1] In light of the rapid development in the world and globalization, this development made the application of risk management alleviate the challenges, but with the emergence of the Corona virus in 2019, governments took measures that affected the economy, but despite the efforts made by countries in a cooperative manner in many sectors, but they could not neutralize The risk, as the outbreak of the Corona virus and the mechanism of dealing with it by different countries of the world showed the weakness of institutions in dealing with such risks [4] Here, focus must be placed on improving risk management steps to reduce the organization's problems and enable it to keep pace with development and adapt it to the Corona virus, including increasing Knowledge of insurance companies (small and medium companies) with concepts of risk and risk management and its procedures, increasing the effectiveness of business performance, evaluating and discussing concepts and necessary steps for risk management and linking them to practical results [1].

When we talk about improving risk management, we must take into account the practical steps that must be taken to manage risks, potential financial losses, and analyze these risks that may cause poor business performance, so we must use the ISO 31000 risk management process. That includes communication, advice and setting context. Risk identification, risk analysis, risk assessment, risk treatment, monitoring and review.

Through this graph, the framework and steps of risk management that can be implemented and performed by small and medium insurance companies in the Covid-19 crisis are presented, to be able to adapt to Covid-19, thus reducing the risks that insurance companies may be exposed to.



Source: *Risk management framework and process. Source adapted from Knight 2010 [5]*

2. Literature review

We review four studies:

1. The study [6]

He studied the initial effects of global risk mitigation measures taken during the fight against the COVID-19 pandemic. The study showed a general lack of understanding of this virus, the mechanism of dealing with it, and the state of confusion witnessed by companies, markets and even countries. The study aimed to build confidence and enhance risk management in all Institutions around the world.

The results of the study can be summarized as the researcher collected information on risks to mitigate risks using the classification approach in countries combating the Coronavirus, as he concluded that it is difficult to reduce risk measures and increase effectiveness, and the reason is the weaknesses in the current systems of institutions and governments in dealing with such risks and where he There was not enough preparedness from the countries and companies as there were countries and institutions that started working from the beginning to understand the problem and deal with it, which led to a decrease in the size of the potential risks and reduce them to the lowest possible, but the failure of the economic system to deal with the crisis led to the turbulence of the economy as a whole and this has an effect. Also on insurance companies and other companies, as controlling the risks of the Covid-19 virus and adapting to dealing with it in addition to controlling the risks of technology was in an unorganized manner because it was not clear how the virus was transmitted and to what extent it would spread and what its future impact would be. Technology was also used. In an attempt to adapt to the epidemiological situation.

2. Through the studyof [7] "Effects of COVID-19 on Corporate Governance, Guarantee, Finance and International Economy"

It was made clear that the Corona crisis that suddenly occurred had far-reaching repercussions on the economy, whether for small or large insurance companies, where companies do not enjoy Small insurance with a level of financial security and may lead to its collapse or weakness due to the depletion of the margin of financial safety, to the occurrence of a state of financial distress and its inability to fulfill its obligations, which will constitute risks to the economy as a whole, and among these risks exposure to strong competition between companies in addition to inflation and ultimately the occurrence of financial deflation Which threatens the financial system and economic growth, so companies and their management must pay attention to risk management and that this management be flexible by thinking of innovative forms of financial security, insurance or otherwise, with a focus on arranging risk management and integrating it into business strategy.

Where we summarize the results of the study that the Covid 19 crisis opened the way for good thinking in addressing new risk management and anticipating what will happen in the future, because there is a coming crisis due to the Covid-19 crisis, and we must be well prepared for it. The researcher advised that studies be conducted on many topics, including financial risks in light of the Covid-19 crisis and other upcoming crises.

3. The study [2] under the title (Risk Management Practices in Small and Medium Enterprises: Evidence from Romania, Management and Economics Review, Romania)

The results showed a positive relationship between applying risk management steps in identifying, analyzing, evaluating and treating risks, and integrating risk management into existing activities.

The similarity between the previous study and my studies is that both of them included analyzing and evaluating risks and how to deal with them, and studying the effect of risk management steps in improving business performance in small and medium enterprises.

Also, both of them included the analysis and evaluation of risks and how to deal with them, which will open the way for researchers to study the impact of risk management steps in improving business performance in small and medium-sized companies.

But it was limited to a specific part and was not comprehensive for all steps of risk management and it lacked the components of improving business performance that was added in my study to examine the relationship between risk management and improving business performance.

4. The study entitled (Analysis and comparison of sources of economic and financial risks in small and medium enterprises from the Vise Grad Group).

It aimed to compare the selected factors and the experiences of businessmen in influencing the risk assessment approach in small and medium enterprises. Data collected from 21,110 SMEs in Hungary, Poland, Slovakia, the Czech Republic and Serbia show that the most common risks they face are insufficient profits, tax increases and interest rates hikes.

Based on what was stated in the study, we notice that it focused on the comparison between the countries in which it was mentioned, and did not address

the importance of business performance, and was unable to generalize the study as it used the descriptive analytical approach to describe the case of the study and its theoretical and applied aspects by dealing with descriptive statistics tools to describe the role of improving risk management On business performance in small and medium enterprises.

The study emphasized that the interest rate and taxes are a major risk for small and medium enterprises.

However, through our study, we will address the steps of risk management in order of importance, as follows:

1. Identify risks

When talking about identifying risks, it is one of the most important steps in risk management and is also adopted in the risk assessment process, as the components of risk assessment come from identifying, analyzing and evaluating risks in insurance companies, whether small or large. Down to all companies at the economic level [8].

We explain through the previous drawing that the steps of risk management are intertwined with each other, as when we explain about the mechanism for identifying risks, it is in two stages

The first stage:

This stage clarifies the discovery of the risk process and assigning the management to identify the risks in order to monitor and evaluate the risks effectively and address these risks in addition to monitoring the risks in order to obtain an assessment of the risks and know the action that we will take after that to prioritize the risks according to their importance in order to make recommendations For senior management, and with the Covid-19 epidemic situation, this stage is done by trying to adapt to the Covid-19 crisis by using technology so that small insurance companies can make profits and continue working.

The second stage:

The role of the management and its board in making sure that what has been reached in the priority-setting process is going in the right frame so that the decision is appropriate and this process also falls under the strategic planning, setting the epidemic, the responsibility of the insurance company's board of directors is to ensure that the priorities that are going They are properly positioned and pre-approved.

Consequently, risk identification can be considered as stated in Airmic, Alarm, IRM: "Risks are identified to determine an organization's exposure to uncertainty. It must be approached in a systematic manner to ensure that all important activities and all risks arising from these activities are identified" [1].

2. Risk assessment

The steps of risk management are interconnected with each other, especially in the evaluation process, as it contains three steps to manage risks [9], but here we will focus on how to set the standard on the basis on which the evaluation process is conducted in small enterprises. For those responsible for managing risk, the risk is either "acceptable" or "unacceptable" (and thus can be addressed) which, as stated in ISO 31.000 2.22, indicates: "Terms of reference used to assess the significance or

significance of risk in your organization. They are used to determine whether a certain level is. Are the risks acceptable or unacceptable" [8].

The risks are evaluated in the form of matrices and classified according to the priority and nature of the procedure, such as the risks associated with the risks of the Covid 19 epidemic, and how they are classified according to the priority and nature of the procedure. It should be based on consulting with stakeholders about the principles and laws in place in order to be able to deal with the Covid-19 crisis, make profits, and create technological products that help them profit and keep pace with progress [1].

3. Address the risks

When talking about treating risks, it is related to the previous steps, but here we adjust or mitigate risks and mitigate the impact on companies in the economic and financial aspects, [8] when we talk about the Covid 19 crisis, risk management must modify or reduce the risks in steps Risks treatment: Consequently, conducting a risk control process and maintaining financing, by providing financing to counter risks that reduce the economic or financial impacts and reduce the economic consequences and losses in companies, whether it is a large or small company, and whether it is in the insurance industries sector or others. However, small insurance companies are exposed to financing risks more, so work must be done to properly address risks and adapt to the Covid-19 crisis and any similar crisis in the future as steps to deal with risks will be defined as specified in [10].

"Risk treatment involves identifying one or more options to modify risks and implementing those options. Once implemented, treatments are available or controls are modified."

4. Monitor risks

After completing the risk management steps, we must monitor the risks continuously, as the current crisis of Covid 19 must be monitored continuously as the monitoring process is linked to the risk control process so that the company can reduce stress and the severity of the loss and adapt the loss until it becomes less and so that we can predict the loss Future in order to address the unexpected risks from the Covid 19 crisis and protect human resources that may affect their health by following the common interest between the company and people.

By focusing on risk management steps, companies should address risks based on four principles:

The first foundation: avoidance

It is a process that you go through through risk management steps for not undertaking an activity that creates risks, although it is possible to undertake the activity that involves risks and move to an alternative approach that is more scientific, complex, and adaptive. Current risk status.

We can summarize the process of transferring risks to another party through different processes and procedures to maintain business continuity and can be used in the Covid-19 crisis, given the maintenance of small insurance companies [7].

The second foundation: loss prevention

It is a process that you perform through application in the steps of risk management and it is based on procedures that lead to preventing the expected loss,

and in the case of the Covid-19 crisis, we mean that is training employees on electronic work in order to prevent the spread of the epidemic that leads to the loss of the employee's life Thus, using the method of loss prevention and business continuity and adopting electronic work after with training and awareness of workers and implementing a successful program to prevent potential loss.

The third foundation: reduce loss

It is a process that you perform through the application in the steps of risk management, and is based on the process of reducing the severity of loss, that is, in the case of Covid-19, the company will be closed for 14 days in the event that an employee in the company is infected and working through electronic technology instead of all workers in the company, At this stage, we need to measure the benefit and cost continuously, so that we can be sure that this measure minimizes the potential losses and that the benefit achieved is greater than the cost.

The fourth basis is separation, duality and diversification

It is a process that you implement through application in risk management steps, which is based on starting to separate and disperse certain activities between different sites, then duplicating, and then emphasizing the existence of a double reserve for risks and then doing this to ensure diversification, and thus the distribution of risks on more than one side. , Which leads to assimilation? Therefore, in the case of Covid 19, the state of preventing the work of one of the activities of the enterprise and the diversification distributes the risks resulting from Covid-19, and the possibility of loss is either separate, married or diversified, thus maintaining the continuity of the company with an emphasis on costs continuously [7].

Risk management has been and remains very important in internal operations from the level of large enterprises through to small and medium enterprises because it can identify risks, as risk identification is very important.

Risk management has been an increasing trend in the company because it works to improve the identification of technologies, measurement and treatment of risks, even with the continuous development in technology, risk management has become a state of uncertainty that we can measure through knowing the potential losses, knowing the potential gains and trying to reduce losses and trying to increase the gains, which leads To agree. Through the “Impact of Uncertainty on Objectives” that illustrates the absence of future information [1].

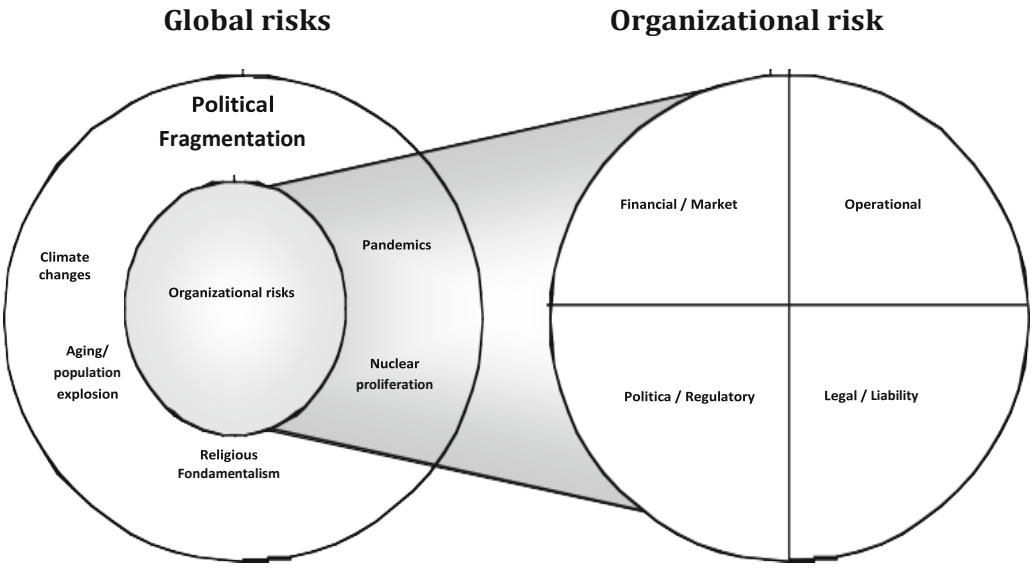
Here risks can be classified according to three main criteria, bearing in mind that there are many criteria for classifying risks

- Physical hazard: refers to a material object that poses a danger, such as a flammable substance.
- Ethical risk: in the sense associated with a person's personality traits, such as dishonesty
- Ethical risks: the humiliation of intangible search, such as indifference [1].

Note that SMEs face many risks as the continued survival of small-sized enterprises with low financial and non-financial resources are highly vulnerable to threats [2].

It is among the risks that may be related to or as a result of the Covid 19 crisis

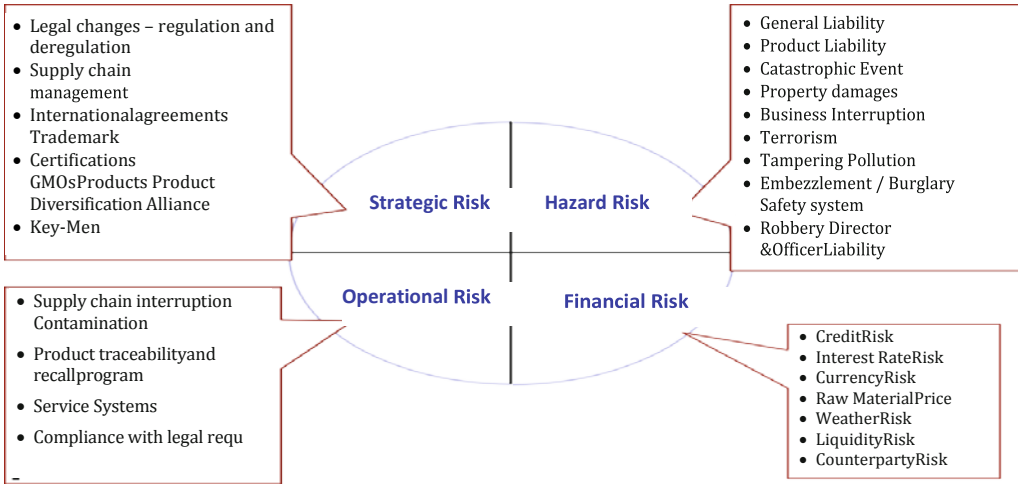
From the Risk Spectrum to the Four Big Risks



Source: *Kloman's risk spectrum. Source modified from (Kloman 1992)*

In this diagram, the main group of four risks is shown, and in this diagram we will focus on the risks of epidemics that we are currently witnessing, noting that if there is knowledge of the risks before they occur, the risks will be lower, due to the state of non-adaptation to Covid 19, and thus the increased risks in Insurance companies.

The chart also shows many of the risks that may accompany the risks resulting from Covid 19, which may directly affect the lack of liquidity for small companies, which exposes them to collapse or their inability to borrow, and therefore these risks must be taken into account when referring to the arrangement of risk steps correctly until We achieve a state of sustainability and continuity in the work of the institution.



The concept of risk should be referred to as (an uncertain event or methods that negatively and positively affect the objectives of the project).

Building a risk management plan

We mean developing a method for dealing with risks and the stages of treatment, starting with communication, counseling, setting the context, identifying risks, analyzing risks, assessing and treating them, monitoring risks and reviewing them in the next treatment in a correct manner [11].

Insurance:

Insurance is a way to deal with unexpected effects on the economy of the institution, according to the way in which the process of developing insurance products, and insurance can address the largest possible amount of risks, as insurance provides a process involving the world and the private sector in reducing risks.

Insurance is most effective when you can reduce the risks and adapt to the risks

Where disaster insurance can be interpreted as insurance that reduces vulnerabilities and increases core strengths manages resources better and accurately anticipates future risks.

When we talk about small insurance companies and how to solve their risks to reduce the possibility of loss and reduce the cost of capital, two basic points must be clarified.

The first is about risk transfer and the second is about technological security. The first is risk transfer. Capital through an entire network of insurance companies.

As for the second point related to technological security and how to secure technological risks, as all companies, regardless of their shape and type, completely depend on technology to facilitate all their operations. Insurance companies that may pose a threat to the insurance company itself because they pose a great danger to business, which pushes companies to raise the level of electronic security and make it a priority in corporate tasks, although some companies do not do so. The adoption of this risk in the insurance mechanism, and this causes an imbalance despite the state of technological development and with the presence of the Corona virus and complete reliance on work on technology and reducing office work, which posed a danger to some companies and the difficulty of adapting to the virus as a covid in some other companies, and there are companies that were ready and ready To adapt to the virus and there was an increase in its profits at the expense of it.

Lee companies that led to fire losses in their profits negatively affected the financial stability of the companies

Here, I will talk more about Corona virus and Risk Management [12].

In light of the rapid development taking place in the world, this development has made risk management and its application to mitigate the challenges facing enterprises, which made it a great challenge [12].

With the emergence of the Corona virus in 2019 in the Chinese city of Wuhan on the first of January, and with the state of concern about knowing the cause of the virus, were the bats according to the similarity of the sequence between the virus and bats, or from seafood that was sold in Huat, this virus created a threat not only For companies but the greatest danger to humans, resulting in a large number of

diseases and a large number of deaths despite the measures taken by governments and cooperative efforts made between countries in many sectors.

The outbreak of the Corona virus and the way the world deals with it illustrates the weakness of institutions in dealing with such a threat [13].

Despite all this, the challenge in achieving the best steps in risk management during the Corona pandemic [1] requires the use of scientific knowledge-based steps to manage risks, starting with communication, counseling, setting context, and identifying risks. Analyzing, evaluating and treating risks, monitoring and reviewing risks to maintain sustainability and continuity. Firms are working both by using technology while maintaining production status and also focusing on technology risks when adapting to the Corona virus [12].

It is among the risks that may be related to or as a result of the Covid-19 crisis

3. Conclusion

Companies that have sufficient financial liquidity are able to continue operating despite the Covid-19 crisis. As for companies suffering from poor liquidity, they have suffered from this crisis due to shortcomings in commitments and have caused the closure of many small projects.

On the other hand, companies that were able to obtain borrowing work have overcome this crisis. As for companies that were unable to borrow due to their small size, they were unable to fulfill their obligations and could not cope with the Covid 19 crisis that affected them by the collapse.

On the one hand, companies that were able to adapt risk management steps to the current epidemiological situation using technology and restricting profits by creating technology programs were able to continue operating. Firms that did not rearrange risk management steps in the event of a pandemic suffered from high risks.

We noticed that large companies can secure large liquidity as a result of providing liquidity or as a result of their ability to borrow easily and their ability to adapt to technology by providing expertise in this aspect.

As for small and medium companies, they lack liquidity as a result of the crisis and continue to pay their obligations without achieving a large return, which has affected their financial position.

Therefore, it is essential for small businesses in the insurance sector in light of the ongoing COVID-19 crisis

- Developing its electronic operations and adapting them to the crisis to provide liquidity to continue working
- These companies obtain government loans or government support during this crisis through soft loans with low interest or postponing the loans due on them and deferring the tax on these companies

Rearranging risk management steps to deal with the Covid-19 crisis and secure financial reserves for the future.

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Galati – smart city? Desideratum or reality

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Abstract

Objectives *We all want to live in a smart and innovative city. In Galati, a few steps have been taken towards its development and transformation into a Smart City.* ***The purpose*** *of the research is to analyze the steps taken to achieve this goal.* ***The objectives*** *of the article aim at drawing up a SWOT analysis for the city of Galati and the guidelines for medium and long term development strategies.* ***Prior work*** *The paper is a continuation of previous research conducted in the field of funding from the European Union and it is based on personal experience as a practitioner in public administration domain, in the management of European funds.* ***Approach*** *The chosen research method is case study, which will present some successful projects in Galati, whose implementation contributes to the economic and social development of the municipality.* ***Results*** *The study highlights both the results of the projects and the degree of fulfillment of the desideratum of transforming Galati into a Smart City.* ***The implications*** *of the study for the local public administration and for the Galati community are to be considered, for practitioners in the sense of using the information from the presented strategies, and also for the inhabitants - awareness of the positive and negative aspects of the city, of potential opportunities.* ***Value*** *The paper highlights the current status of Galati compared to other county seat cities in Romania and the desire of its inhabitants to live in a true Smart City.*

Keywords: *project management, development strategy, public administration*

1. General considerations

Everyone has an idea of what a city is. For some of us, it's a place of constant activity, concentrated work energy, and tremendous innovation. Others see a playground filled with tempting and expensive opportunities for consumption and exploration. Detractors hear the noise, resent the crowds, and complain about congestion, unsanitary conditions, and overcrowded residential areas. Urban planners see great potential for both progress and problems. Corporations analyze

the opportunities for growth and a favorable business climate. Most everyone senses the future already exists, in some budding form, within cities, but whether one sees a paradise, a dystopia, or something in between depends greatly on economic status, geographical location, and personal experience.

"The smart city is a new way of leaving and considering the cities. The optimization of available and new resources, as well as of possible investments is required. The achievement of smart city objective can be reached through the support of various information and communications technologies. These can be integrated in a solution considering the electricity, the water and the gas consumptions, as well as heating and cooling systems, public safety, wastes management and mobility" [7].

"A city connecting the physical infrastructure, the IT infrastructure, the social infrastructure, and the business infrastructure to leverage the collective intelligence of the city" [6].

A smart ecosystem, proposed by Marston and van Hoof [8] considers that the rapid pace at which technology is developing, intersects with current trends in smart cities.

The concept of the smart city is far from being limited to the application of technologies to cities. In fact, the use of the term is proliferating in many sectors with no agreed upon definitions. This has led to confusion among urban policymakers, hoping to institute policies that will make their cities "smart." [1]

Albino et al. [1] tried to clarify the significance of smart cities through a literature review and found that it first appeared in the 1990s. They concluded that it is a multifaceted phenomenon that includes, among other things, the qualities of people and communities, as well as ICT. It seems to be a lack of universality, both in its definition and in its performance measures [1, 3]. Some of the definitions include references to healthcare, for example, how a smart city is prepared to provide conditions for a healthy and happy community in the difficult conditions that global, environmental, economic and social trends can bring. Or, the use of smart computing technologies to transform components and services, of a city's infrastructure, including healthcare, smarter, interconnected and efficient [1]. In another paper, a smart city is an urban area that uses and deploys various electronic devices and sensors [2], which have the ability to collect and use data in an attempt to provide efficient and smarter resources to residents and communities.

Giffinger et al. [4] identified four components of a smart city: industry, education, participation, and technical infrastructure. This list has since been expanded in a project conducted in 2010 [5]. These components are a smart economy, smart mobility, a smart environment, smart people, smart living, and smart governance. These writers rely on the traditional and neoclassical theories of urban growth and development: regional competitiveness, transport and ICT economics, natural resources, human and social capital, quality of life, and participation of society members. Particularly interesting in the previous list of components of a smart city is the inclusion of the "quality of life." This component emphasizes the definition of a smart city as a city that increases the life quality of its citizens [4]. However, many researchers argue that quality of life may not represent a separate dimension of a smart city, as all the actions taken in the other areas

should have the objective of raising the quality of life, so that this represents the basic component [10].

In the last decade, initiatives have also emerged in Romania to transform cities into "smart cities". In this process, some factors play an important role - for example, the economic factor that led to the existence of disparities between development regions in Romania. It favors the implementation process of smart city projects in more developed regions due to the ability to attract large private companies to invest and it creates the favorable context to contribute as municipalities with their own funds to the co-financing of such projects. Thus, the regions favor the development of smart city initiatives in the three most developed regions of the country: the Ilfov Region, the North-West Region and the West Region, while the other regions are left behind.

Another factor with a decisive role in the implementation chain of projects in Romania for the smart city are transnational organizations, mainly European Union programs, which are almost an exclusive source of funding for these projects for local authorities. Consequently, local authorities (most often municipalities) submit projects in accordance with these grants and not necessarily in accordance with local priorities.

2. Case study - Galati Municipality

Galati is located in the eastern part of Romania, in the southern extremity of the Moldova plateau, on the left bank of the Danube, at the confluence of the Siret and Prut rivers, near Lake Brates, the largest body of water in this part of the country. The life of human communities was directly influenced by the Danube, the second longest river in Europe. Due to the deep sailing line to the area of Braila, the Danube is declared maritime (i.e. seagoing ships can sail, if the water level at the mouth of the Danube in Sulina and St. George is quite high).

2.1. SWOT analysis for the city of Galati

The results of the socio-economic analysis give an overview of the current resources available to the community, highlighting for each issue the strengths, weaknesses, development opportunities to be exploited, as well as possible risks/threats to be eliminated/avoided [1]. The SWOT analysis was performed on areas of interest, as follows:

The Economic domain

Strong points	**Weaknesses**
Location on the banks of the Danube	Outdated technologies, machinery and equipment
Existence of the Free Zone	The industrial park is unused
The industry has a significant share in municipal GDP	Fishing industry in decline
Developed tertiary sector (trade, financial services, ICT)	Lack of foreign and domestic investors
Large number of university graduates	Highly skilled labor migration
Existence of RDI institutions in the fishing and naval field	Low average salary
	Lack of PPP type initiatives

Opportunities	Threats
Construction of the multimodal platform in the Port of Galati Attracting European funds for SME development, Development of fish farming and aquaculture Investments in research - development - innovation	Unstable, unstimulating legislation for business development High labor costs Decrease in the number of employees due to labor migration High costs for technology modernization

Transport and urban infrastructure

Strong points	Weaknesses
Diversified public transport (bus, trolleybus, tram) Important traffic node (wide gauge railway and river route) The largest river port and important river operators Direct access to the TEN-T river network (Danube) Experience in project management for infrastructure rehabilitation	Non-modernized roads, lack of highways / express roads, airport Heavy road traffic High percentage of unmodernised streets Degraded port infrastructure Used vehicles for public transport Lack of detours Lack of infrastructure for electric vehicles Insufficient parking spaces Outdated water network Existence of neighborhoods not connected to the water and sewerage network Degraded district heating network and the bankruptcy of centralized supply operator
Opportunities	**Threats**
Promoting alternative and multimodal transport Accessing European funds for the development of road / rail / river transport infrastructure Use of structural funds for energy efficiency of public buildings Possibility to attract structural and cohesion funds for modernization / extension of the water / sewerage network Possibility to use electric vehicles for public transport	Delayed modernization of transport infrastructure The large number of vehicles affects road traffic The increase in traffic influences the number of accidents High maintenance costs for public transport vehicles The undersized electricity network compared to the increased number of users Outbreaks of infection in areas not connected to the water and sewerage network

Health

Strong points	Weaknesses
Important regional medical center Developed private medical sector	Old / inadequate hospital buildings Outdated medical equipment Low number of hospital beds
Opportunities	**Threats**
Accessing European funds for the rehabilitation and endowment of hospitals Accessing European funds for the rehabilitation and endowment of specialized outpatient clinics Accessing European funds for the qualification of medical staff	Migration of medical staff abroad / private sector Increased morbidity High occupancy rate in hospitals

Education

Strong points	**Weaknesses**
Diversified network of educational institutions Diversified educational offer in high schools and universities	Old / not modernized buildings in the educational network Educational offer not correlated with the demands of the business environment
Opportunities	**Threats**
Accessing European funds for the rehabilitation and modernization of educational institutions	The decrease of the number of students due to the low birth rate and the aging of the population The financial difficulties of poor families for the schooling of students School dropout

Social assistance

Strong points	**Weaknesses**
Existence of a significant number of public and private service and social providers	Small number of social workers Insufficient capacity of social service centers in Galati
Opportunities	**Threats**
Development of family-type social services for children Increasing the involvement of NGOs in providing social assistance	Migration of specialized personnel due to the low level of salaries in the field Worsening the living conditions of vulnerable categories Increasing the degree of social exclusion

Tourism and culture

Strong points	**Weaknesses**
Location on the banks of the Danube Existence of numerous museums / monuments / patrimony buildings Accommodation and public catering services	Degraded historical monuments Lack of a tourist information point Untapped tourist potential Important undeveloped tourist attractions (Danube bank, Lake Brates)
Opportunities	**Threats**
Unlocking the potential offered by the Danube Accessing European funds for the rehabilitation and endowment of patrimony buildings Development of leisure tourism	Degradation of heritage objectives Insufficient investment in tourism Lack of adequate tourist promotion

Environment protection

Strong points	**Weaknesses**
Favorable geographical position Existence of specialized institutions in the field and qualified human resources Existence of the Air Quality Plan in Galati	Small number of NGOs in the field Lack of procedures for assessing contaminated sites
Opportunities	**Threats**
Accessing European funds in the field of environmental protection and biodiversity Promoting investments in areas with ecological risk	Extreme natural phenomena (drought, floods, heavy snow) Air pollution with dangerous noxious substances Industrial platforms with risk of pollution

2.2. Strategic development objectives

In line with the SWOT analysis, several guidelines for medium and long-term development strategies have been highlighted.

The strategic objectives of the Sustainable Development Strategy 2021-2027 of the Municipality of Galati, which aims at achieving the general vision for 2027 and fulfilling the mission assumed, were formulated in accordance with the political objectives of the Cohesion Policy of the European Union Agenda 2030:

- OS1. Development and promotion of SMART solutions in order to ensure an innovative and smart economic and social transformation
- OS2. Sustainable and integrated urban development, promoting energy efficiency and a transition towards clean energy
- OS3. Development of sustainable urban mobility and connectivity at regional, national and European level
- OS4. Sustainable development in the social, economic and environmental fields, focused on integration and social inclusion
- OS5. Promoting the development of cultural, tourist and leisure patrimony, through hard and soft type investments
- OS6. Strengthen administrative capacity in order to ensure decision-making coherent, efficient and transparent and maximizing the use of national budgetary funds and at the level of the functional urban area [9].

2.3. Successful projects in Galati

The case study presents several implemented or in progress projects, in the city of Galati, whose realization contributes to the economic and social development of the city. The project leader is the City Hall of Galati or Galati County through the Galati County Council, depending on the ownership of the building / land related to that investment. The projects target various fields - road infrastructure, education, health, patrimony buildings, etc. the financial allocation by domains being presented in figure no. 1:

Transport and urban infrastructure

- Extension and modernization of the bypass variant of Galati municipality, financed by ROP 2014-2020, Priority Axis 6 - Improvement of road infrastructure of regional importance (SUERD), partnership Galati County and Galati Municipality, total project value: 135 million lei, proposed results: 10.5 km of extended and modernized road (bypass of Galati) and construction of a Hoban bridge.
- Modernization of tram and road lines Traian Vuia, Henri Coandă, George Coșbuc Streets (Henri Coandă Section - Al. Măcelaru Street), financed by ROP 2014-2020, Priority Axis 4 - Supporting sustainable urban development, beneficiary Galati Municipality, total project value: 104 million lei, proposed results: rehabilitation of the tramway, rehabilitation and modernization of public passenger transport stations, construction or modernization of

bicycle lanes and sidewalks as well as rehabilitation of the roadway of the road infrastructure.

- Modernization of tram and road lines Siderurgistilor streets and December 1, 1918, financed by ROP 2014-2020, Priority Axis 4 - Supporting sustainable urban development, beneficiary Galati Municipality, total project value: 104 million lei, proposed results: road rehabilitation of trams, rehabilitation and modernization of public passenger transport stations, construction or modernization of bicycle lanes and sidewalks as well as rehabilitation of the roadway of road infrastructure.
- Providing Automatic Travel Tariff Collection, Passenger Information and Vehicle Fleet Management Systems for the Municipality of Galati" (e-ticketing), funded by ROP 2014-2020, Priority Axis 4 - Supporting sustainable urban development, beneficiary Galati, total project value: 26 million lei, proposed results: automatic tolling system (e-ticketing), passenger information and fleet management.

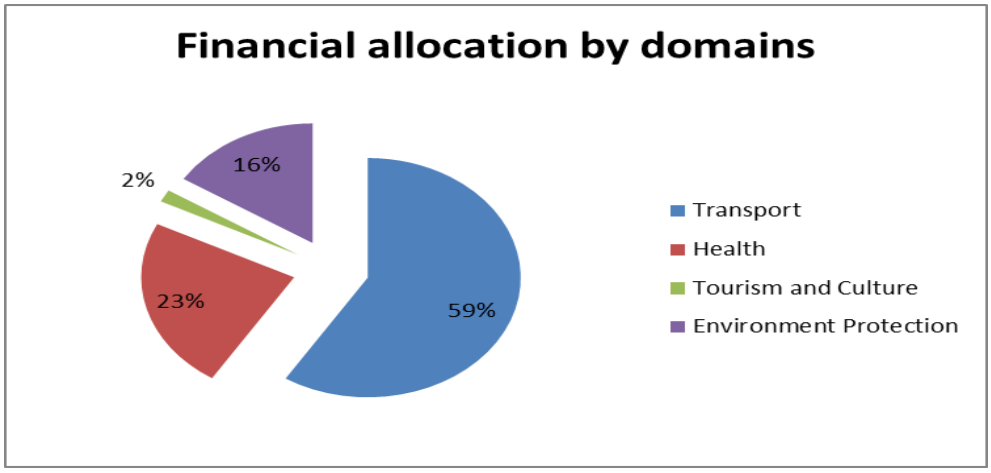

Fig. 1. Financial allocation by domains
Source: Processing information from projects

Health

- Increasing energy efficiency for the County Emergency Clinical Hospital "St. Apostol Andrei", financed by ROP 2014-2020, Priority Axis 3 - Supporting the transition to a low carbon economy for eligible activities, beneficiary Galati County, total project value: 69 million lei, proposed results: structural consolidation of the outpatient building, the introduction of alternative systems from renewable sources to ensure at least 10% of energy needs.
- Expansion, modernization and endowment of the Emergency Reception Unit, the County Emergency Clinical Hospital "St. Apostol Andrei "Galati", financed by ROP 2014-2020, Priority Axis 8 - Development of health and social infrastructure, Investment priority 8.1., Specific objective 8.2.,

Operation B - Emergency reception units, total project value: 6.6 million lei, proposed results: Extension works of the existing building and endowments (computed tomography and other medical equipment necessary for the modernization of emergency medical services).

- Extension, rehabilitation, modernization and endowment of the Integrated Specialty Outpatient Clinic of the County Emergency Clinical Hospital "St. Apostol Andrei", financed by ROP 2014-2020, Priority Axis 8 - Development of health and social infrastructure, Investment priority 8.1., total project value: 12 million lei, proposed results: rehabilitation, modernization and extension works of the Ambulatory building and medical equipment for various specialties.
- Extension, rehabilitation, modernization and endowment of the Integrated Specialized Outpatient Clinic of the Galati Pulmonology and Phtisiology Hospital, financed by ROP 2014-2020, Priority Axis 8 - Development of health and social infrastructure, Investment priority 8.1., Total project value: 9.5 mil. lei, proposed results: rehabilitation works, modernization and extension of the building, acquisition of medical endowments and equipment (including 1 CT scanner).
- Extension and redevelopment of the Radiotherapy Section, the County Emergency Clinical Hospital "St. Apostol Andrei" Galati, financed by ROP 2014-2020, Priority Axis 8 - Development of health and social infrastructure, Investment Priority 8.1., Total budget value Galati County 4.9 million lei.
- Equipping the Integrated Specialist Outpatient Clinic of the Clinical Hospital for Infectious Diseases "St. Pious Parascheva", financed by ROP 2014-2020, Priority Axis 8 - Development of health and social infrastructure, Investment Priority 8.1., Total project value: 2.7 million lei, proposed results: acquisition of medical equipment for detecting chronic diseases (hepatitis) and diseases with endemic-epidemic potential.
- Modernization, Extension and Integrated Outpatient Clinic - Emergency Clinical Hospital for Children "St. Ioan" Galati, financed by ROP 2014-2020, Priority Axis 8 - Development of health and social infrastructure, Investment priority 8.1, beneficiary Municipality of Galati, total project value: 15.6 million lei, proposed results: integrated outpatient modernization.
- Rehabilitation, modernization, extension and endowment of the Emergency Department - Emergency Clinical Hospital for Children "St. Ioan" Galati, financed by ROP 2014-2020, Priority Axis 8 - Development of health and social infrastructure, Investment priority 8.1, beneficiary Municipality of Galati, total project value: 10.9 million lei, proposed results: rehabilitation, modernization and endowment Reception department - emergencies
- Rehabilitation, Extension and Equipping of the Specialized Outpatient Clinic of the Psychiatric Hospital "Elisabeta Doamna" Galati, funded by ROP 2014-2020, Priority Axis 8 - Development of health and social infrastructure, Investment Priority 8.1, beneficiary Galati, total project value: 14.5 million lei, proposed results: rehabilitation, extension and endowment of the specialized outpatient clinic.

Tourism and culture

- Zătun 2 fisheries leisure base, financed by the Operational Program for Fisheries and Maritime Affairs 2014-2020, Measure 1 Promotion and support of activities leading to diversification; job creation; added value; continuous learning; innovation within the Union Priority no. 4 (PU4); Increasing employment and increasing territorial cohesion, Measure III.3. - Implementation of Local Development Strategies, total project value: 2.3 million lei, proposed results: arrangement of the Leisure Base with specific fisheries
- Escapeland - Development and promotion active tourism in the Black Sea Basin, financed by the Black Sea Basin Operational Program 2014-2020, total value Budget value Galati County 396 thousand euros, proposed results: arranging an Adventure Park in Galati,
- Consolidation, restoration and arrangement of the "Casa Cuza Vodă" Museum in Galati, financed by the ROP 2014-2020, Priority Axis 5 - Improving the urban environment and preserving, protecting and sustaining the cultural patrimony, Investment priority 5.1. Conservation, protection, promotion and development of natural and cultural heritage, total project value: 2.7 million lei, proposed results: consolidated, restored and arranged heritage building, digitization of the museum.
- Restoration and arrangement of the "House of Collections" Museum (former Ţinc Pharmacy) in Galati, financed by ROP 2014-2020, Priority Axis 5 - Improving the urban environment and conservation, protection and sustainable capitalization of cultural heritage, Investment priority 5.1. Conservation, protection, promotion and development of natural and cultural patrimony, total project value: 3.5 million lei, proposed results: consolidated, restored and arranged heritage building, digitization of the museum.

Environment Protection

- Integrated waste management system in Galati County, financed by the Large Infrastructure Operational Program 2014-2020, Priority Axis 3.1., Total project value: 103.5 million euros, proposed results: construction of a mechanical-biological treatment facility in the municipality Galati, construction of waste depot and transfer stations, composting, sorting in Galati county.

3. Conclusion

Galati is ranked 6th in the country, depending on the number of inhabitants, with 306 thousand inhabitants, being overtaken (figure no. 2) by Constanta with 311 thousand inhabitants and followed by Craiova, with 299 thousand inhabitants and Brasov with 289 thousand (statistics on January 1 2020) [11].

a b

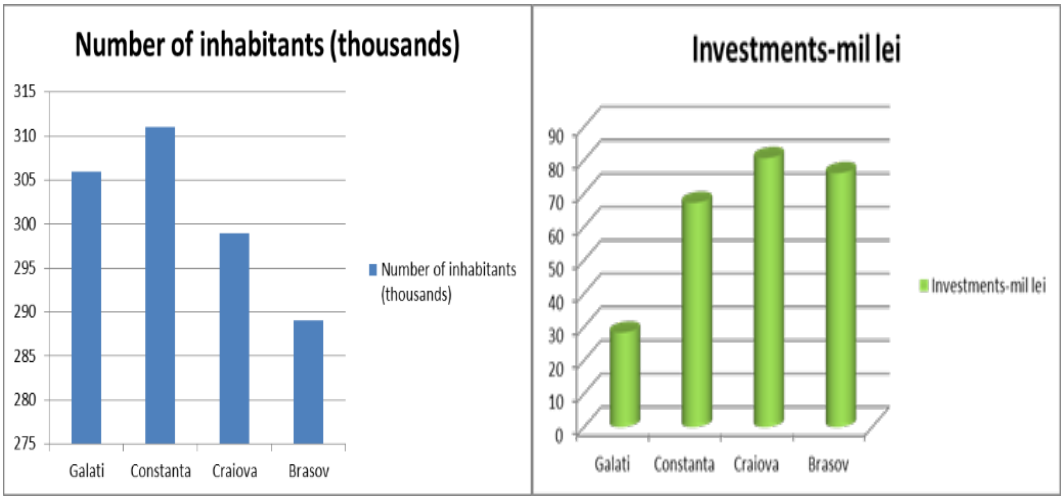

Fig. 2. (a) Inhabitants; (b) Investments in Galati compared to municipalities with similar numbers of inhabitants
Source: Processing information provided by INSSE and municipalities

But, from the point of view of the gross domestic product, Galati is overtaken by all four municipalities. The declining number of births and the increased mortality lead to an accentuated decrease of the population in Galati. The existence of an aging population determines a growing need for medical and social services. At the same time, Galati is facing one of the highest unemployment rates in the country. Thus, in June 2020, Galati had an unemployment rate of 5.66 percent, being surpassed only by Teleorman, Mehedinți, Buzău and Dolj.

Investments are the engine of development of a city, the money invested generating other money, materialized in other investments, jobs, well-being. In 2019, Galati City Hall allocated from the budget 28.3 million lei for investments (figure no. 2), while Craiova 80.6, Constanta 67.2, Brasov 76.1 [12]. We consider that, in accordance with the results of the presented projects, important steps have been taken in transforming Galati into a "smart city".

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The economic importance of transportation and the circular economy of Iraq

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Abstract

Transportation is of great importance in supporting the economy of Iraq and its one of the elements in the process of developing a strategic plan for the infrastructure of Iraq, where the concept of transportation and its importance is the mainstay of life, and the contribution of the transport sector to economic development is evident in that it helps effectively in linking production areas with consumption areas and in securing the movement of individuals And the transportation of raw materials and goods to and from investment areas, as it is considered a catalyst in the exploitation of natural resources, especially minerals, which are often concentrated in remote and sparsely populated areas, and the importance of the transport sector in the employment of manpower and the provision of Employment opportunities for a large segment of the population, whether in the field of transport itself or in other fields related to it or affected by its development; Consequently, the contribution of this sector must be recognized in absorbing the increasing numbers of people entering the workforce and thus in solving the problem of unemployment and the many social ills that result from it. besides, the provision of transportation of various kinds contributes significantly to the increase in cultural exchange between peoples and thus supports the

development Human thought and the flourishing of science and the spread of its gains to spread to all countries of the world, and also transportation plays a major role in supporting and renewing the economic cycle of Iraq, as this research aims to clarify all the concepts and factors that affect the formation of the Iraqi economy.

Keyword: *investment, economic environment, investment in transportation.*

JEL: *LA1, LA2, P22*

1. Introduction

The Iraq one of the countries with have many sources for the economy such as oil, revers, ports, transportation, and industry.

From time to time the Iraqi government consider one or mor of these sources as the main source of the country's economy because many reasons which make the Iraq decided these decisions like the program in 1996 exchange the oil -for food , The program was in operation from December 1996 until March 2003. Observers generally agree that the program substantially eased, but did not eliminate, human suffering in Iraq, (1). this was after the war period which was very hard for the Iraqi people and the economy at that time so in that time the Iraq decide to depends more on other sources and the transportation was one of these sources . therefore the Iraqi government started to develop the transportation and they consider that the transport system will support the economy and create many opportunities for the people to work and use the system in their job also the system was one of the elements which impact on the trade with other countries such as turkey , Syria , Jordan and Kuwait .

After that the transportation became very important for the Iraqi economy and the domestic, foreign trade.

2. The transportation system in Iraq

The city of Baghdad has been reshaped by the development of expressways through the city and by passes built since the 1970s. By 2002, Iraq had 45,550 km (28,304 mi) of roads, of which 38,400 km (23,861 mi) were paved. There were some 1,422,032 cars and 332,026 commercial vehicles in use as of 2000.

Railroads are owned and operated by the Iraqi State Railways Administration. A standard-gauge railroad connects Iraq with Jordan and Syria, and nearly all the old meter-gauge line connecting Irbil in the north with Basra, by way of Kirkuk and Baghdad, has been replaced. In 2002, there were about 2,339 km (1,453 mi) of railway lines.

Iraq had 150 airports in 2002, of which 77 had paved runways. However, an unknown number were damaged during the March-April 2003 war. Baghdad, Basra, and Mosul have international airports. Iraq Airways is the state-owned carrier; in the 1980s, its international flights landed only at night because of the Iraqi-Iranian war. The war also virtually closed Iraq's main port of Basra and the new port of

Umm Qasr on the Persian Gulf. Iraq has some 1,015 km (630 mi) of waterways; the Shatt al Arab is usually navigable by maritime traffic for 130 km (81 mi); the Tigris and Euphrates has navigable sections for shallow-draft boats, and the Shatt al Basrah canal was navigable by shallow-draft craft before closing in 1991 because of the Gulf War. Expansion of Iraq's merchant marine, which totaled 1,470,000 GRT in 1980, was halted by the war with Iran and again by the Persian Gulf War; by 2002, the merchant marine totaled only 25 ships with a total capacity of 186,709 GRT (2)

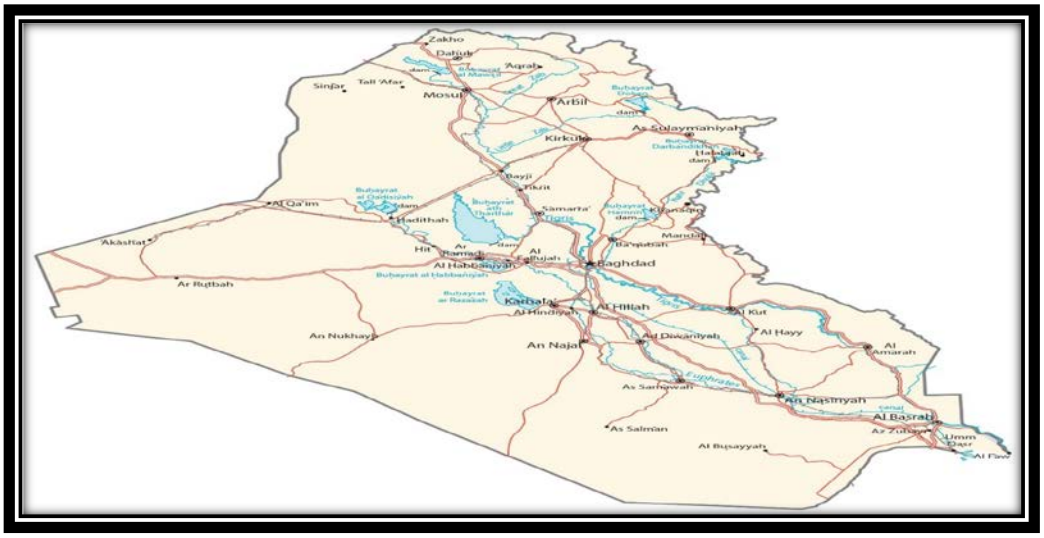


Fig. 1. Iraqi map
Source:https://gisgeography.com/iraq-map/ (3)

3. Importance of the transportation in Iraq

The importance of the transport sector in general has an impact on all commercial and industrial sectors, especially in light of the successive developments in these activities, whose growth and development cannot be envisioned without an advanced transport sector consistent with its bidding. It is imperative to monitor the main features of the reality, challenges and future of this growing sector. Day after day, the pace of activity in it is increasing, and the volume of investments that are estimated in billions is increasing, until it has become a sector that attracts dozens of manpower. Therefore, the future is promising, the prospects are wide, and investment opportunities for the private sector are many, and this is what puts this sector in front of many and many challenges, perhaps the most prominent of which is a challenge. The increasing demand for logistical transportation services, which is growing daily (4)

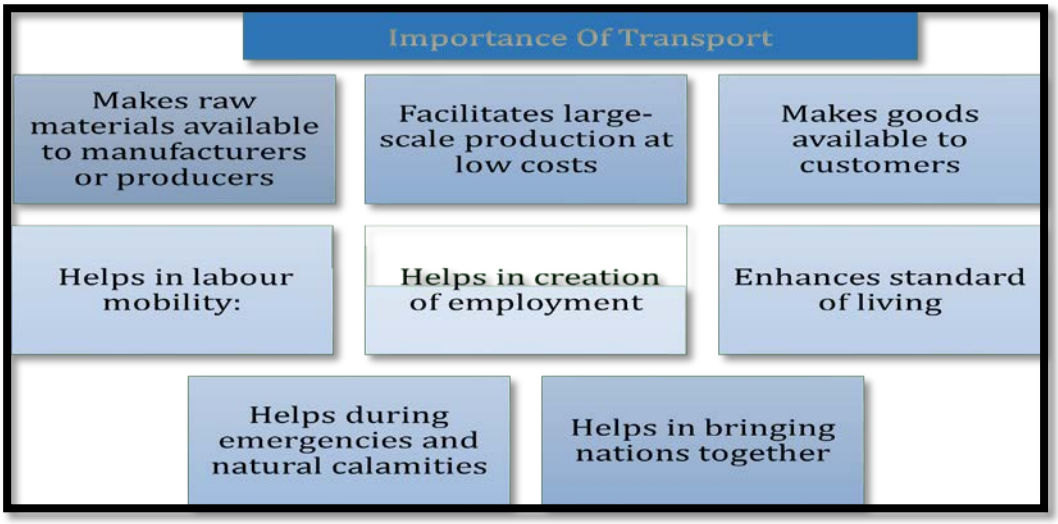


Fig. 2. Iraqi map
Source: *:// https://www.google.com/search?q=importance+of+transportation&source .*

4. The Circular Economy Concept and The Transportation Economy

Circular economy

Circular economy is an economy constructed from societal production-consumption systems that maximizes the service produced from the linear nature-society-nature material and energy throughput flow. This is done by using cyclical materials flows, renewable energy sources and cascading. (5)

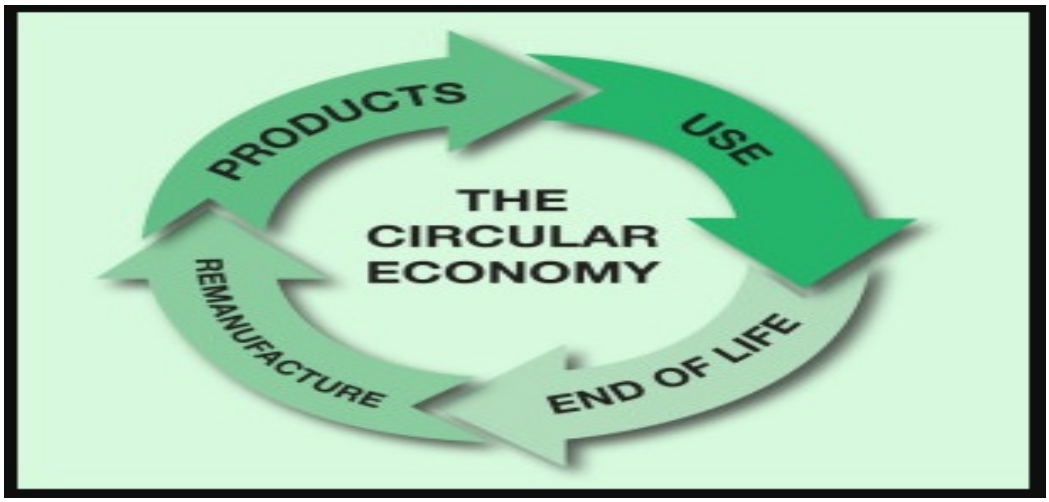


Fig. 3. The Circular Economy model (6)
Source : *https://www.therecycler.com/posts/who-is-supporting-the-circular-economy*

Circular economy (CE) is currently a popular concept for future sustainable development promoted by the European Union and by several national governments (China, Japan, UK, France, Canada, The Netherlands, Sweden, Finland, etc). Also, many business enterprises around the world have introduced CE in their manufacturing sectors to shave energy and raw feeding materials. But for the moment the concept of circular economy is a collection of vague ideas from several technological fields and semi-scientific concepts. (7)

The Transportation Economy

A. Iraq's Export and Import status:

Iraq entered the global trade market in mid-1800 as one of the grain exporting countries.

In early 1930 the crude oil became as a major export for the country which reached 49.3% of the national income in 1953, by 1980 the crude oil was 83% of the total exports while 17% was other products such as fertilizers, building materials, fresh and dried fruit. (8)

Iraq imports various goods: different goods from different markets such as Europe, Asia, America and Africa. As Iraq was engaged in very long wars from 1980 until around Mid-2003, the country needed different goods for economic reconstruction of industry and service sector were destroyed during the war. Most of these imported goods had supported the industries and contributed to the reestablishment of the destroyed infrastructure and thereafter supported the county's exports. (9)

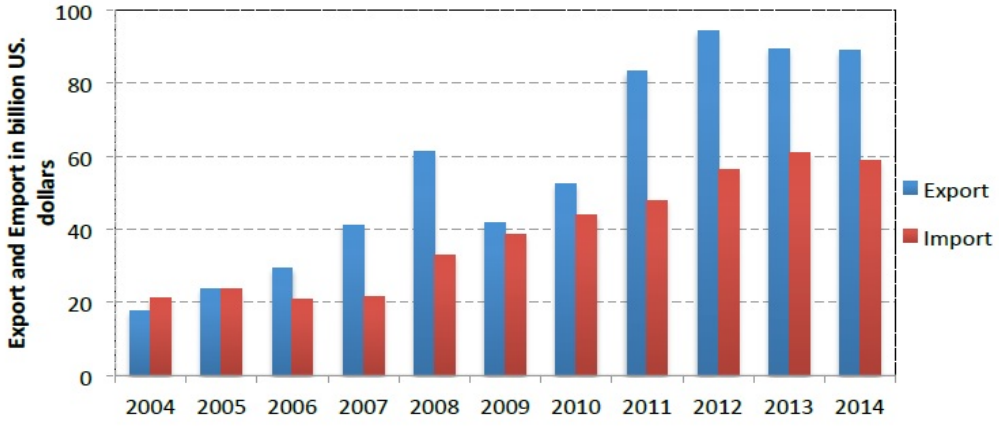


Fig. 4. Iraq import and export of goods from 2004-2014 (in billion US dollars)
Source: *The Impact of Applying Rolling Highway on State Company for Land Transport in Iraq, 2016*

Iraq has different border crossing points and customs offices for import and export, these are both land border crossing points with neighbouring countries and seaports linking the country with the Arab Gulf. These custom points are run by several Iraqi ministries including the Iraqi Ministry of Interior (MOI), Ministry of Finance (MOF),and Ministry of health (MOH). The country has different imported

goods which helped to be ranked as number 62 of the largest importers in the world. The imports have increased dramatically from 2004 to 2014; the imported goods include many various items such as machineries 27 %, metals 15 %, transportation 9.6 %. Iraq's main imports were from Turkey 30 %, China 18 %, South Korea 5 %, Italy 4.3 %, Germany 4.2 % and 38.5% of the goods were from Middle East Arabic countries and from other European countries**.** (10).

Iraq's borders were shown in Figure 4 of a total length of 3631 km divided between Iraq and neighbouring countries including the eastern border with Iran with a length of 1458 km, the southern border with Saudi Arabia and Kuwait of 1056 km, the western border with Syrian Arab republic and the Kingdom of Jordan of 786 km and finally then northern border with Turkey of a 331 km length. The land borders are encircling Iraq 98.4%, which is considered the life artery of the Iraqi economy with the other world's continents. The remaining 1.6% is the water crossing border connecting the country to the Arab Gulf through different Iraqi ports. Figure 2 describes the border crossing points of Iraq with neighbouring countries and 14 water ports. (11)

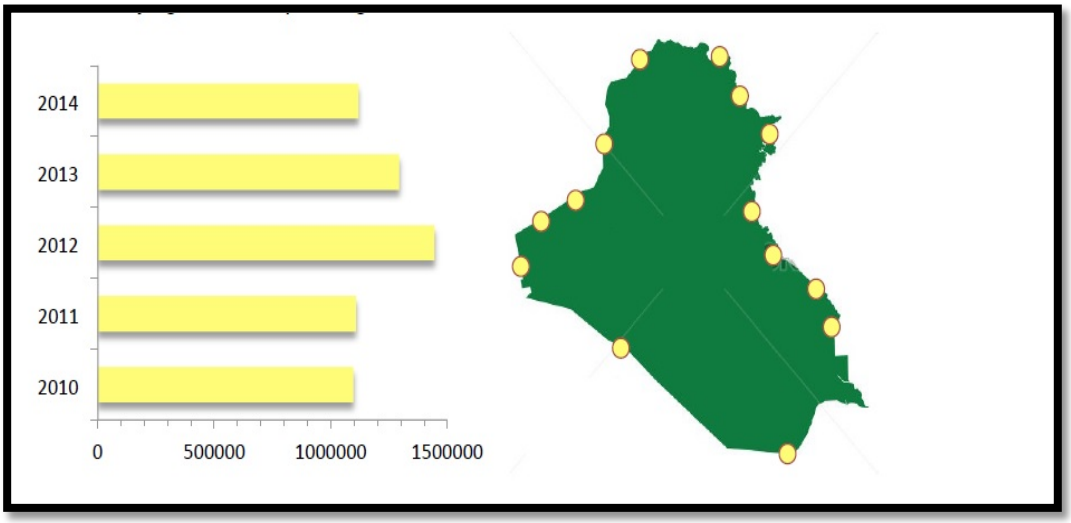


Fig. 5. Trucks are entering Iraq from the borders.
***Source**: Statistics Department offices, 2015*

Iraq is a large country with an area of around 437,072 km2, its population according to 2007 estimated 27,449,638 million. (12) .

Regarding to theses details of the import and export trade by using the transportation environment and the elements of this transportation guide the economy of Iraq to prove that the income of the transportation help the economy and support the Iraqi government to focus and develop this sector .

The need for infrastructure of the road network maintenance and restoration had taken a lot of money, from 2004 to 2007 nearly 5,600 km of road were covered with a layer of asphalt ranging between 4-5 cm, divided into 1100 km in 2004, 1300 km in 2005, 1500 km in 2006 and 1700 km in 2007, while the estimated costs for

maintenance (Routine and Periodic) was estimated to $ 358.31 million. The estimates and details about the maintenance of the network of Iraqi roads are given in Table (1). (13)

Table 1. Roads - Routine Maintenance

Periodic Maintenance (4 to 5 cm overlay)				
	Total Length	(4 to 5 cm overlay) US $/km	Total 2004 - 2007	
			Km	US$ Million
Expressway	1,061	147,000	222	32.599
Primary Roads	10,917	91,000	2,079	189.162
Secondary Roads	14,193	36,000	2,640	95.026
Village Roads	3,704	20,000	660	13.198
Total	**29,875**		**5,600**	**329.986**

Source: *Feghoul, Mohammed. 2003*

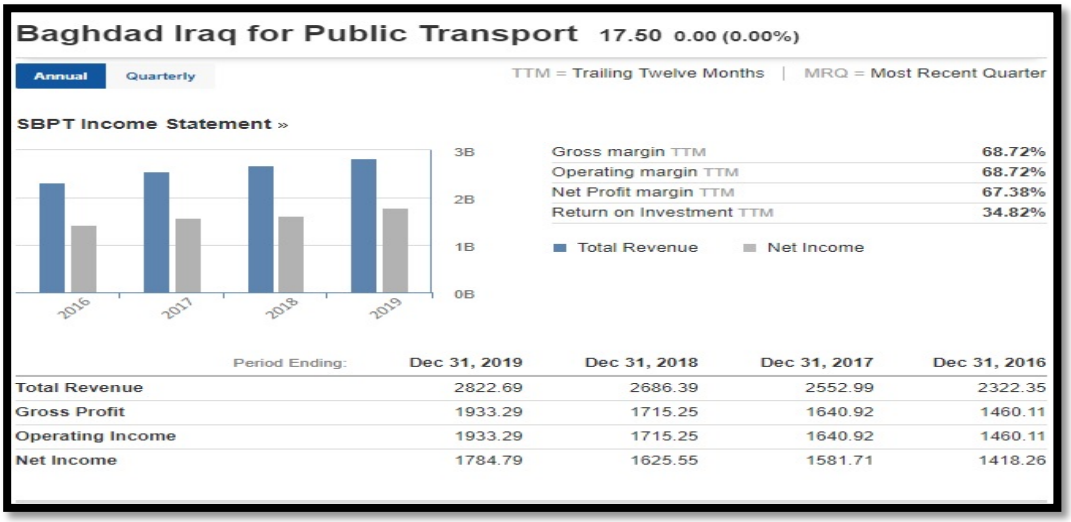
We can see in this table that the Iraqi government they start to invest in transportation sector to many resins the most two popular things are the amount of income from the transportation sector each year and the second resin is the war .

Because of the war the country was for 20 years' without establishing new roads or regular maintenance processes only for urgent matters, and without long future planning to cope with the increased transport in the country. In addition to the road's maintenance cost, there are other costs such as traffic jams among conjunctions of highway, which cost about $ million 36 plus the road safety program with a cost of about 70 $ million. (13)

B. The income of transportation sector:

The income of transportation sector in Iraq is totally different comparing with other countries for many reasons the main one is the wars which the Iraq faced before these wars were the reason to distorted the infrastructure in Iraq for many years and with all these problems that doesn't stop the investing and developing this sector even while the war time because the Iraqi government notes that the transportation sector is one of the sources of the economy , the figure (5) showing the income of this sector in the capital of Iraq as example for the income and this explain for many years from 2016-2019 considering two things , total revenue and net income estimated in dinars (millions) which approximately in each (100) million dinars equal (83) thousand dollars .

These statement only for the capital of Iraq and we can recognize the big amount who gets from this sector such as borders, railways , ports and highways which present (45,000km).



Period Ending:	Dec 31, 2019	Dec 31, 2018	Dec 31, 2017	Dec 31, 2016
Total Revenue	2822.69	2686.39	2552.99	2322.35
Gross Profit	1933.29	1715.25	1640.92	1460.11
Operating Income	1933.29	1715.25	1640.92	1460.11
Net Income	1784.79	1625.55	1581.71	1418.26

*in millions of IQD

Fig. 6. Public transport of Iraq, Baghdad, income statement.(14)
Source: *https://ph.investing.com/equities/baghdad-iraq-for-public-transport-financial-summary*

5. Conclusions

- Regarding to the details the Iraqi government start to consider the income of this sector one of the main sources in the economy.

the investment projects in this sector became in the vision of Iraq.

- Because the wars which the Iraq faced before like the last war that start in 2014 – 2017 make the Iraq rebuilding and develop the infrastructure specially the transportation sector.
- the transportation sector became one of the main source for the economy in Iraq and prove that has very big impact on the economy especially in the last war which make the government loos the source of oil so they decided to invest and develop this sector and this was the source which support Iraq while the three years of war.

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Weirder than we can imagine: the historical evolution / involution of the region in Romanian law. Special focus on the Argeş-Muscel geo-historical space

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Abstract

In the modern era, human society has undergone major changes in political, social, cultural and economic terms. These transformations, which experienced an accelerated pace in the twentieth century and continue into the 21st century, have led human society for the better. The lives of communities and individuals have generally been improved. In many parts of the world, deep injustices and inequities have been eliminated, by securing fundamental rights and by quality leaps in life. At the same time, however, this context has brought with it the coagulation of currents that undermine fundamental values of human society. Aggressive secularism, radical tendencies to redefine the family, marginalization of Christian-moral values are a manifest reality. The Romanian society was not isolated from these developments. Coming out of a long totalitarian period, Romania and its inhabitants are still struggling to find themselves, to rediscover those common values, which are part of its intimate fabric, as in the case of our scientific research, the territorial administrative organization.

***Keywords**: Romania, European Union, administrative law, region, regionalization, sovereignty.*

1. Introduction

In the modern era, human society has undergone major changes in political, social, cultural and economic terms. These transformations, which experienced an accelerated pace in the twentieth century and continue into the 21st century, have led human society for the better. The lives of communities and individuals have generally been improved. In many parts of the world, deep injustices and inequities have been eliminated, by securing fundamental rights and by quality leaps in life. At the same time, however, this context has brought with it the coagulation of currents that undermine fundamental values of human society. Aggressive secularism, radical tendencies to redefine the family, marginalization of Christian-moral values are a manifest reality. The Romanian society was not isolated from these developments. Coming out of a long totalitarian period, Romania and its inhabitants are still struggling to find themselves, to rediscover those common values, which are part of its intimate fabric, such as the territorial administrative organization. From this common identity, our history, shared by an overwhelming percentage among the citizens of Romania, interwoven into our national ethos and which influences the social, cultural and political manifestations of the Romanians, is part of our common identity, being the reference to which we refer as a common standard, timeless and absolute.

Starting from these considerations, from the multitude of problems, we try to configure, in our scientific research, the historical evolution of the concept of region. The term comes from the word "regere" which means to rule, to divide. E. Reclus (1885, 1887) defined it as a space that serves as a basis for the administrative division of nation-states. Starting from the natural regions, to the homogeneous, historical, cultural regions, it was reached the functional region, subsequently included in spatial theory (Isard, 1956; Boudeville, 1972; Paelinck, 1985; Polese, 1994) and in regional development, including economic growth. . The theory of growth poles, founded in the 1950s, made the link between the development of cities and regions, the growth pole being regarded as an economic unit capable of inducing regional structural changes, found in the growth rate and in the growth of regional production. In a century, the evolution of the concept of region has led to the understanding that behind this widely used, often overused word, there is a geographical, economic, human, cultural and historical reality. The relativity of the notion of region depends on the reporting scale, which is why the variable geometry of the term has led to many challenges, especially in the 1970s and 1980s, with other concepts being proposed, such as the area, the functional space, the macrofunctional space. From the same period dates a new revival of concerns about the concept of region, related to regional development. The region passing through several phases of evolution, including through the region-system and development region, becomes considered to be the most adapted operational notion for a period when the state loses importance, through globalization. This led to the assertion that today's world is no longer a world of states but of regions, hence the idea of fragmenting Europe into regions and considering them as the basis of continental cooperation. At the same time, the region can be a differentiated analysis and development framework for reducing inequalities at the level of a state or part of the

European continent. The region is a conceptual structure and therefore its meaning can vary from one culture to another and between the members of different communities and the legal coagulation followed the historical context, internal and external, of the evolution of Romania.

2. About the evolution of the administrative-territorial organization of Romania in the interwar period

Although the first regulations regarding administrative-territorial organization begin in 1864, together with Law no. 394 of March 31, 1864 for urban and rural communes and Law no. 396 of March 31, 1864 for the county councils, the Romanian unitary national state was only consolidated in 1918, when the Great Union was built. This event marked the completion of the state and national unity by carrying out the unification of the Old Kingdom of Romania with the historical provinces of Bucovina, Bessarabia and Transylvania. From the territorial administrative point of view, the newly integrated historical provinces were organized according to the legislation specific to the state of which they were a part, which remained temporarily in force. Thus, during the period between the Great Union, which took place on December 1, 1918 and up to the time of the Law on administrative unification, on June 14, 1925, 4 administrative regimes worked on the Romanian territory, namely: Austrian, Hungarian, Russian and the one from the old kingdom, each having its own characteristics.[1]

As these administrative regimes were adopted under the imperative of different systems and circumstances, the four administrative cut-offs had their own characteristics, relative to the political and socio-economic reality of each region, characteristics that induced significant imbalances throughout the country. In the immediate period following, the legislator's main concern was to ensure the unity of regulation on the level of constitutional and administrative law, because it aimed directly at the organization of power and state administration. Regarding the means of achieving the unification of the legislation, two possible variants have been identified: either the extension of the application of the existing legislation in the Old Kingdom of Romania and in the historical provinces, or the elaboration of new normative acts, which will replace the existing ones, by synthesizing the existing ones. better regulation of each branch of law. The main advantage of extending the existing legislation in the Old Kingdom of Romania was the fact that it would have ensured a fast pace of legislative unification, thus achieving an immediate integration of the historical provinces. On the other hand, the legislation was adapted to the social, political and economic needs existing in the territory of the Old Kingdom, needs different from those existing in the new provinces, an aspect that could have created serious imbalances.[2]

The unification of legislation by the second method created the premises of a superior legislation both from the point of view of the legislative technique and the content. However, this method involved a much longer period of time, in which to study the existing legislative systems, in order to identify and synthesize the useful parts of each system. Finally, both methods were used in the process of legislative

unification, being applied the extension in certain branches of the law (for example: constitutional law, civil law, criminal law, criminal procedural law) and the elaboration of new normative acts in the other branches. (for example: financial law). Regarding the territorial administrative organization of Romania, it was tried to create a new normative act, which proved to be, finally, an extension of the existing legislation in the Old Kingdom of Romania. Throughout history, the Romanian state has undergone a multitude of administrative reforms, thus knowing various forms of territorial administrative organization, implemented through a succession of normative acts.

The first normative act after the accomplishment of the Great Union, which regulated the territorial administrative organization of the newly formed Romanian state was the Law for administrative unification of 1925, which was a materialization of the legislative project elaborated by the liberals who were in government at that time. This divided the territory of Romania into counties, urban and rural communes and plateaus, conferring the first two legal personality. Shortly after the adoption of this first normative act by the territorial administrative organization of the newly formed Romanian state, following the coming to government of the peasants, a new legislative project was drafted which provided for a reorganization. This project was debated and adopted by the Parliament on August 4, 1929, materializing through the Law for the organization of the local administration, which introduced for the first time the ministerial directorates, in order to decentralize the central power and establish higher regional structures. The law renews the idea of the historical regions organizing the territory of the country in 7 ministerial directorates named after the chosen cities administrative centers: Bucharest, Cernăuți, Chisinau, Cluj, Craiova, Iași and Timișoara.[3]

The last administrative reform, until the outbreak of the second world conflagration, was carried out after the introduction of King Carol II, under the regime of the new Constitution of February 27, 1938, when the Administrative Law of August 14, 1938 was adopted, a normative act introducing a new territorial administrative unit, besides the existing ones, respectively the county. The breakdown by land was similar to the ministerial directorates, but the approach was different, because the historical provinces were not taken into account in their delimitation and the motivation was based on a statement regarding the real needs of the new Romanian twin inhabitants.[4] The 10 lands newly established had the status of administrative - territorial units with legal personality and economic, cultural and social attributions, and their administration was entrusted to a royal resident. In 1940, in the context of the territorial losses of that year, it returned to the division of the Romanian state into counties and communes, as administrative-territorial units with legal personality, heritage and own budget.[5]

3. The legal regulation of the region in the history of the Romanian state

Although the concept of region and the phenomenon of regionalization appear as a novelty in Romanian law, they are not entirely foreign to the historical evolution of the Romanian state. Over time, several projects were proposed for organizing the

local administration, which included, among others, the establishment of the region as a territorial administrative unit, of which we mention the following:

- In 1862 Barbu Catargiu proposed to divide the Romanian Principalities into four regions, namely Moldova de Sus, Moldova de Jos, Muntenia and Oltenia.[6]
- The project was resumed in 1912 by Petre P. Carp, who proposed the division of Romania into six regional constituencies[7].
- The same idea was also resumed in 1921 by Constantin Argetoianu, in whose project of organizing the local administration there was also found the creation of nine regions[8].
- And in the Parliamentary debates on the Law for the organization of the local administration in 1929, the regional organization of the Romanian territory was discussed.

Despite the fact that over the years there have been numerous discussions and regionalization projects, only in 1948 the region is aware of a constitutional consecration in Romania, when it is recognized as a territorial administrative unit together with communes, plazas and counties. Subsequently, following a new administrative reform generated by the coming into power of a pro - Soviet government, by the Judeobolshevik sources, and by the establishment of the communist regime, the Romanian territory knows a new division, based on the criterion of social economic complexity. Thus, the counties were abolished, and Law no. 5 of September 7, 1950, normative act that was characterized by a perfect centralism, divided the territory of Romania into regions, cities, districts and communes. The source of inspiration for this administrative-territorial division was represented by the Soviet model, and the novelty constituted one of the two territorial administrative units, identical to those existing in the territory of the USSR, respectively the regions and districts, created in order to exercise a much greater control of the central power over local administration. The main declared purpose of the administrative reform was the economic development, and in the subsidiary we find the facilitation of the approximation of the State apparatus to the population of the country. Therefore, the new territorial administrative division did not take into account the historical regionalization, but was based on the economic criterion, the new administrative units being considered as "territorial units operationally from an economic, political and administrative point of view" [9]. Moreover, from a political perspective, between 1952-1968, in the center of Romania there was a Hungarian autonomous region, established according to the Soviet model. It was an experiment imposed by Soviet dictator Stalin under pressure from communist leaders in Budapest, by a constitution formulated in Moscow. In this sense, in 1950, in Romania, the first post-war administrative reorganization took place following the Soviet model. Thus, the 58 counties were transformed into 28 regions and 177 districts. Two years later, following the amendment of the law, a first reorganization of this system takes place, following which by merging ten districts from the former Mures and Stalin regions, the Hungarian Autonomous Region is established. The Hungarian Autonomous Region existed in this form until 1960. The region's residence was in Târgu Mureș, and its territory covered an area

similar to that of the present Covasna and Harghita counties, as well as the eastern part of Mureş county. The region had about 13,550 km^2 and a population of approx. 730,000 inhabitants mainly of Hungarian ethnicity. The official languages of the region were Romanian and Hungarian. The establishment of the Hungarian Autonomous Region was a simple political experiment whose mentality fits perfectly with the Soviet model, which no state with popular democracy in the Moscow sphere of influence, dared to elude.

Within this imposed model and with the help of the autochthonous tails, the appropriate legal framework was also created, according to which the region was a territorially delimited administrative-economic unit, on which the central state bodies directly supported in carrying out the Party and Government policy. The region was directly subordinated to the central organs of the State and consisted of districts and cities of regional subordination (those localities, which, from an economic and political point of view, were of particular importance for the whole region). The district was a territorial unit, economically, politically and administratively operative. It was subordinated to the region and was made up of cities of district subordination (those localities, which, from an economic and political point of view, were of particular importance for the whole district) and common. Thus, the notion of region was characterized by a strong centralism, being considered an instrument by which the central power exercised control over the local authorities.

After returning to the forms of territorial administrative organization before the communist regime, respectively the county and the commune, and until the adoption of Law no. 151/1998 regarding the regional development in Romania, the notion of "region" has not known any legislative consecration. The aforementioned normative act did not, however, create a new territorial administrative unit in Romania, but development regions constituted by their voluntary association, the purpose being an exclusively economic one. It should be noted that the notion of region and the concept of regionalization have known in Romanian law a completely different meaning than at European level. While around the Romanian concept of regionalization, the declared idea of citizens' access to the management of local public affairs revolved around the purpose, the aim really being a predominantly political one, controlling the central power over the local administration, at European level were based on economic considerations. In countries such as France or Italy, for example, the engine of regionalization was the removal of the state from the economic crisis, by creating an intermediary structure that would allow economic factors much easier access to the participatory decision-making process. In Romania, on the other hand, all the argumentation for regionalization has a predominantly political and administrative character, without taking into account the economic side and our current reality, in a Euro-Atlantic context.

4. Brief analysis of the current reality

The constitution in force at the moment in Romania does not make any reference to regions, but to the concept of decentralization. For a better

understanding of constitutional terminology, a legal analysis of some diametrically opposed notions, namely centralization and decentralization, but also of the principle of local autonomy, is required. Centralization is the system that, while acknowledging the existence of a local interest, does not provide the mechanisms for its promotion from an organizational and functional point of view. From the organizational point of view, the centralization is transposed by a hierarchical subordination of the local authorities to the central authorities, and from a functional point of view, by the fact that the decision documents are issued by the central authorities and implemented by the local ones. Therefore, local public authorities do not have the initiative to promote the interests of local authorities. Even when the legislative system confers certain responsibilities in this respect, they are limited and, consequently, do not offer a real possibility of asserting the identity of local authorities.

Decentralization is that system based on the recognition of the local interest, distinct from the national one, the local authorities having both organizational structures and their own heritage, in order to achieve the local interest. The basis of decentralization is both political and administrative. On the one hand, at the political level, decentralization aims to ensure the participation of citizens in the management of local authorities through the local authorities chosen by them. On the other hand, at the administrative level, decentralization is based on the principle that the authorities chosen by the citizens should know best the local needs and take the necessary measures to achieve them. Decentralization is inextricably linked to local autonomy, in the specialized doctrine the opinion that local autonomy constitutes a right is outlined, and administrative decentralization represents a system that presupposes it[10].

This assertion does nothing but designate the right of local authorities to have decision-making powers in matters of local interest. Thus, the principle of local autonomy could be defined as representing the capacity of local authorities to manage their local interests and problems according to their own reason, without the intervention of the central authority, but by observing the provisions of the legislation issued for the field under debate11. The absence of a regulation at the constitutional level of the region does not prohibit the creation of such structures, which would confer a high degree of decentralization to the Romanian state. This process, however, would be a laborious one which would first of all involve the creation of a legal basis to ensure the implementation of a new administrative model. Moreover, territorial administrative reorganization must ensure a functional and viable system. As a consequence, the change cannot be sudden, but must be done step by step in order to ensure the acquisition and adaptation of the old concepts, but also the implementation of the new ones with maximum efficiency in order not to create an administrative instability, which would inevitably lead to an economic one. and social. Now, after these brief theoretical considerations, from a legal point of view, let us dwell on an area very dear to me, to the Argeş-Muscel geo-historical space, where I saw the light of day, examining the temporal coordinates of the land that gave the first capitals. of our homeland.

5. About the geo-historical space Argeş-Muscel

5.1. Specific issues

Regarding the writings related to the geo-historical space Argeş-Muscel, we emphasize, mainly, the steps belonging to the traditionality. Such volumes, having diversified content, illustrate, by reference to the level of known information, historical, geographical, linguistic, economic or demographic aspects, the role of personalities originating from this part of Romania, other valuable details. Among the authorities in this field, who analyzed realities specific to the mentioned area, we nominate: Nicolae Iorga, George Ioan Lahovari, Constantin D. Aricescu, Constantin Giurescu, Aurelian Sacerdoţeanu, Constantin Alessandrescu, Dan Simonescu, Gheorghe Pârnuţă, Augustin Z.N. Pop, Nicolae Leonăchescu, Florian Tucă, Dan Zamfirescu. In turn, some local authors have stopped on their favorite areas.[12]

According to the Encyclopedia of Argeş and Muscel, I, Pitesti, 2008-2014, "the present county Argeş, a name superimposed on the legendary ancient hydronym Ordessos / Argesis, has, by uniting with the Muscel, since 1950, statistically, the area of 6,826 km^2, which represents, approximately, 2.9% of the territory of today's Romania, and the number of inhabitants is, on average, 645000 people. It has three municipalities, four cities, 95 communes being a well-known historical, economic, cultural, social, spiritual, tourist area. After January 1, 2007, it is part of the Southern Muntenia Euroregion ". The official residence, the municipality of Pitesti, was attested by a written document (May 20, 1388), bearing the seal of Mircea cel Bătrân (1386-1418). At the Court of Argeş and Câmpulung, former royal capitals, there are important voivodal and royal necropolis. The first reference to the former Arges county dates, it seems, from August 13, 1437. The record, reproduced in Documenta Romaniae Historica, B, Romanian Country, Volume I, Bucharest, 1966, reminds, on page 50, of "Lănjeşti din Arghis", from the current locality Lunca Corbului (Argeş). Even the graphics from the old traditional county coat of arms, as reproduced in the Encyclopedia of Romania, Bucharest, 1938, p. 33, document that "Argeş County is part of the mountain counties. It is located in N V Muntenia, on the upper valley of Argeş and on the old road that, coming from Transylvania, on Turnu - Roşu, reached the former residence of the voivodes, Curtea de Argeş. And today this road is the shortest between Sibiu and the current Capital of the country. Coat of arms: blue shield, with a golden eagle, taking its flight from a green mountain with three pools symbolizes the extent of the dominion of the Argeş voivodes, over the entire country of the Romanian Country".

The name of Muscel is subsequent: April 30, 1536, during the time of Mr. Radu Paisie / Peter from Argeş (1535-1545). There was, temporarily, in this area, the Pădureţ County, notified, on July 19, 1498, during the time of Mr. Radu cel Mare (1495-1508), then merged with the Muscel. According to the Encyclopaedia of Romania, Bucharest, 1938, p. 290, "Muscel County is part of the mountain counties of Muntenia and is located in the north-east of this province on the old road, coming from Transylvania, over the Bran pass, passing through the Campulungului depression and reaching , over the peaks and peaks, in Valea Argeşului, in the capital

of the times, Curtea de Argeş. From here, the close ties that this county has always had with Transylvania, more than perhaps with the rest of the country. Coat of arms: blue shield, with a golden eagle, with red beak and claws, standing on a green oak branch symbolizes the beginnings of the Romanian Country reign in this county. It is the old heraldized coat of arms".

Over the centuries, the general evolution of the Argeş-Muscel area has been approached as demographic, economic, social, cultural, religious. The two entities are defined medieval and resized by the legislation of 2/14 April 1864, elaborated during the time of Alexandru Ioan Cuza (1859-1866), having lands, nets, urban or rural communes, villages. According to the territorial organization decided by the Romanian sovereign, Carol II (1930-1940), Argeş and Muscel counties became part of Bucegi County, governed from Bucharest (1938-1940), and in the 1940-1944 stage, were integrated into Region IX, structure condensed to military criteria, established by the head of state, Marshal Ion Antonescu (1882-1946). As of November 30, 1944, Romania had 58 counties. Some southern Arges settlements belonged to Teleorman County.

Based on the Law no. 5, from September 6, 195013, the vast majority of localities in Argeş, Muscel, Olt, Vâlcea formed the Argeş Region (1950-1952; 1961-1968) / Piteşti Region (1952-1961). It was divided into the districts: Băbeni-Bistriţa, Costesti, Curtea de Argeş, Drăgăneşti Olt, Drăgăşani, Găeşti, Horezu, Muscel, Piteşti, Potcoava, Râmnicu Vâlcea, Slatina, Topoloveni, Vedea, totaling 15 800 km^2, 5,6 of villages. From January 1, 1961, Băbeni-Bistriţa and Topoloveni were dissolved, followed shortly by Vedea.

By Law no. 57, from February 16, 196814, was reverting to the administrative organization by counties. However, compared to the traditional situation, Argeş and Muscel remained united, a situation that continues even today, painful for us, the Muscelen, who, by abolishing Muscel County, we remained homeless.

Geographically, the heights of the Fagaras mountains, from the Southern Carpathians, unite Argeş, to the north, with the counties of Sibiu and Braşov; the seeded ridges of the Leaota Massif, the hills of the Getic Plateau and part of the Romanian Plain constitute the eastern bridge with Dâmboviţa county; The Găvanu-Burdea plain borders it, to the south and south-east, with Teleorman and Olt counties; the water company, between the rivers Argeş and Olt, gives its vicinity, to the west, with the counties of Valcea and Olt. The relief, like a huge amphitheater, is deciphered, from the north to the south, from the Moldovean Peak (2,544 m) to the alluvial plains. Piedmont lands occupy more than half of the previously mentioned territory. On the valleys dug by water in mountains and hills, on the beautiful plains and mosses, along roads and highways, as well as in the plain, there were early settlements. The material and spiritual life of Argeş-Muscel has gone up, through the centuries and millennia, with the uninterrupted evolution of the other traditional lands. There is no older or new building in this area, which does not mention the personality of the Romanian people, their efforts for independence, unity, progress, civilization. Here was Ctitoriei Country, the cradle of the formation of the primordial feudal state, often called Muntenia or Valahia, here were the first princely residences, from the Court of Argeş and Câmpulung, from here was issued the first

coat of arms of Basarabil, symbolizing the beginnings of the reigns and the extent of its dominion, in the 14th century, over all the inaccurate geography, including the north of the Danube mouths.

5.2. The role of the Argeş-Muscel area during the Middle Ages

Efforts to maintain our medieval structures have often focused on these places. Thus, on November 12, 1330, the voivode of Argeş, Bessarab I the Founder (c. 1310-1352), obtained the emblematic victory from Posada, from the beginnings of the Perisans, about which he will also mention the chronicler Martin Strykowski from Poland: "Hungarian King Carol, rising a terrible war on the mountain lord Basarab, he was completely defeated ... so that with his few he barely escaped." On October 10, 1394, the army led by the voivode Mircea cel Bătrân (1386-1418) faced the armies of the legendary Sultan Baiazid (1389-1402), the Romanian army obtaining in Rovine, somewhere, on the Plain south of Piteşti, as many think. analysts of the period, a resounding success. "It was a great war," notes in 1620, the learned monk Michael Moxa, how dark the widow by the crowd of arrows ... and Baiazid lost his army altogether. At the Court of Argeş, Mr. Nicolae Alexandru (1352-1364) established the first Orthodox metropolis of Muntenia (1359). Sixteenth-century documents recorded important aspects regarding the role of the Argeş-Muscel area during the time of Mr. Neagoe Basarab (1512-1525), the one who left us, among others, the Episcopal Church of the Court of Argeş, aureolized with the Ballad of Manole Manole, as well as the famous philosophical texts brought together under the Generic Teachings. Then, during the Radu voivode of Afumaţi (1522-1525), one of his 19 fights with the Turks was carried to Rucăr, on the way to Brasov (1522). Particularly important are the facts of the first unifier of the Romanian Countries, Mihai Viteazul (1593-1601), spent, in 1595, in Stoeneşti, between Câmpulung and Târgovişte, later, November 25, 1600, near the old residence of the Court of Argeş, where he employed his last one. military initiative south of the Carpathians. Not long ago, Mr. Matei Basarab (1632-1654) installed, at his residence in Campulung, a printing press. They maintained, with the people of these places, at the same time, the voivodeships Vlad Călugărul (1481-1495), Constantin Serban (1654-1658), Serban Cantacuzino (1678-1688), Constantin Brâncoveanu (1688-1714), but also some Phanariotic rulers. (1716-1821), whose legislation and codes, will direct our pre-modern administration. In 1793, in Pitesti there was the seat of an Orthodox episcopal chancellery, subsequently transferred to the Court of Arges.[15]

5.3. Argeş and Muscel in the modern and contemporary era

Argeş's book lists important and significant concepts or moments during the national events of 1821, 1848, 1859, 1877, 1918. As proof, Tudor Vladimirescu, the initiator of innovative actions from 1821, who had served temporarily in the administration of the Muscel, included the city Piteşti, as a Nordic strategic point of eventual resistance, in the plans of the revolutionary movement, elaborated with the direct agreement of some patriotic luminists. The precipitation of the events did not

allow, however, the application of those envisaged, on the contrary, the Vladimiri citizen became captive of his allies, the leaders of the Greek Aether, in the camp established at Goleşti, paying, on May 27, 1821, with his life, somewhere near Targoviste, the daring of to raise the wishes of the lower nation to the value of European cardinal requirements. Traditionally, until the eighteenth century, Arges county was coordinated, territorially, from the Court of Arges, residence becoming, then, the city of Pitesti.

Between 1831-1864, both Argeş and Muscel were governed by survivors, replaced, by the Law of administration, from April 1, 186416, with prefects (French inspiration). The county councils also appear. According to the Organic Regulation, applied, effectively, between 1832-1858, Arges county had the plains Aref and Loviştea, as well as six nets: Arges, Galesesti, Oltul de Jos, Pitesti, Topolog, Vâlsan. Similar structure we also meet in Muscel county: Argeşel, Dâmboviţa, Nucşoara plains; the rivers and vineyards. Over time, many changes will occur.

An important success of the management of the two counties was the establishment of the village state schools, by applying the Command of the Department of Internal Affairs, dated, Bucharest, January 14, 1838. The activity was coordinated by the Eforia Schools in collaboration with the Great Logistics of Church Works. At the beginning of the decade, national (normal) schools for the campuses of Campulung (1832) and Piteşti (1833) were set up, which prepared the first teachers for rural institutions. Thus, for example, on April 2, 1839, in the Podgoria net (Muscel) 17 primary schools were considered open. Argeşen and Muscelen were actively involved in the Revolution of 1848, noting several personalities from this area, such as: Ion C. Brătianu, Dumitru C. Brătianu, Ştefan C. Golescu, Nicolae C. Golescu, Radu C. Golescu, Alexandru C. Golescu (Albu), Alexandru G. Golescu (Black), Constantin D. Aricescu, Ion D. Negulici, Nicolae Kretzulescu, Carol Davila. It should be mentioned that, for the most part, the members of the Provisional Government from 1848 came from such places, and at Rucăr, the executive board was recalled for a short time, at a time of disorientation of the leaders of the revolution.

In order to achieve the unification of the Romanian Principalities, respecting the ones provided by Article 5 of the High Emperor Firman, elaborated by the Ottoman Chancellery, regarding the elections for the Ad-hoc Assembly of Muntenia, the Argesians chose to represent them, by the expressed will, on September 17th. 1857, as deputies, for Scarlat Turnavitu, Dumitru C. Brătianu, Ion C. Brătianu, Tudosie Murgescu, and the Muslims preferred Stefan Golescu, Alexandru G. Golescu (Black), Constantin D. Aricescu, Ion Tică. Among those who met the Lord of the Union, Alexandru Ioan Cuza, in Bucharest (February 7, 1859), together with other officials, were the piteşten Nicolae Coculescu and Eftimie Nicolau. For a few months, in June 1859, the prince visited the residence of Argeş, and Mrs. Elena Cuza arrived here on October 3, 1863.

During the War of Independence (1877-1878), most of the mobilized Argeşians and Muscels were part of the 4 Dorobant Regiment, the 2 Calarasi Regiment, the 4 Hunters Battalion. To begin with, the Dorobans defended the Danube line, then, through the General Headquarters Order, they will participate in the fighting with the Turks from Capitanova, Rahova and Vidin, and the military

units of the horsemen were in the group of those who conquered Rahova, Haltagi, Desa , Tatar, Mahala, Smârdan, Inova. The hunters, having the command in Calafat, will take over (November 25, 1878), after completing the hostilities and achieving the expected success, the control over the city of Constanta, directly contributing to the establishment of the Romanian administration on the territory of Dobrogea in the stage between the peace treaties in San Stefano (February 19, 1878) and Berlin (July 13, 1878). Before the festivities in Bucharest (8/20 October 1878), the Government of Romania, together with the future king Carol I, concentrates the army in the strategic triangle Piteşti-Câmpulung-Târgovişte, which highlights the importance given to the Argeş-Muscel area at the end of the Russian-Turkish conflict of 1877 -1878.17 It should be noted that the martyrs of independence, originally from the counties invoked, are recorded, after 1984, in the original commemorative work „*Argeş. The book of heroes*" unique bibliophilia in Romania, being inscribed at the same time on the monuments existing in all localities in this part of the country, together with those who fell on duty in 1913, 1916-1918, 1941-1945.[18]

Argeş and Muscel were connected to the national efforts of Romania's participation in the First World War (1916-1918), the event favoring the Great Union from 1918. The military from Piteşti were located, on August 21, 1916, in the area of Transylvanian operations, which- however, they were unfavorable. Towards the end of November 1916, they arrived, through Buzău Pass, in Moldova, participating, between July 22 - August 1, 1917, in gaining the victory against the Maras Central. It should be noted that the 4th Argeş Regiment, stationed, for a while, in Iasi, passed Prut, on February 24, 1918, ensuring the order during the debate of the Decision of the Union of Bessarabia with the Romanian State, adopted on March 27, 1918, then cantoning in Husi. He returned to Pitesti at the end of 1918. Special reasons prompted the Romanian Government to consolidate the military support from Bessarabia, united with the Motherland, in which the 4th Argeş Regiment left from Bucharest to Chisinau (February 25, 1920), being kept beyond. by Prut, until September 15, 1922. For exactly one month, King Ferdinand was crowned at Alba Iulia, becoming the first monarch of Greater Romania. The distinguished and glorious trajectories also had the military units from Campulung, found in 1916, on the Dobrogean Front, or in Mateiaş, Valea Mare-Pravăţ, Dragoslavele.

The participation of our country, for the period 1941-1945, in the Second World War (1939-1945), brings this area back to the forefront of the events of the respective stage. The offensive to the east was officially motivated, starting with June 22, 1941, along with Axis, through the historical obligation of the reintegration of Bessarabia, Northern Bukovina and Herta County into the local territory. We highlight the fact that, according to the final notes of the Government of the Soviet Union, from June 1940, several families of Romanians from the aforementioned provinces will take refuge in Argeş-Muscel, finding honorable jobs and jobs here. The reorientation of Romania's foreign policy, in August 1944, resulted in the participation of local military units on the Western Front, as far as Slovakia and Austria, comparing the human tragedies of the eastern stage of the war. The years 1941-1945 increased the blood contribution of the citizens of Argeş-Muscel to the altar of the supreme sacrifice, symbolically raised in the spirit of peace, democracy, freedom and independence of the people.[19]

5.4. Argeş and Muscel during the communist period

After the defeat of Fascist Germany, Romania enters the sphere of influence of Moscow. Soviet troops remain in bases close to the cities of Pitesti, Campulung, Curtea de Argeş, until 1958. Since the beginning of the expression of the post-war communist regime, in the northern area of Muscel and Arges have been organized various opposing groups, the most active being led by Gheorghe Arsenescu. and Toma Arnăuţoiu (officers), called Muschal's Haiducii, annihilated by the State Security in the six decade of the 20th century. Many of the fighters and supporters have been captured, tried, sentenced to years of imprisonment or executed. At the same time, in the residence of Argeş there was the famous prison of the drastic detention, where ingenious techniques were used to re-educate the detainees through torture, which generated the phrase Piteşti Experiment, a sad memory for the history of these places. In the southern settlements, the opposition aimed, as a priority, to counteract the collectivization of agriculture and the expropriations of executors. The systems promoted and applied during December 1947 (abolition of the monarchy and the establishment of the Romanian People's Republic) - December 1989 (military coup), gave the Arges-Muscel area a certain contradictory identity, in the sense of canceling, for example, the local organizational pluralism, by imposing the exclusivity of the dominant pyramid, a phenomenon superimposed, however, favorable resizing of urban structures, intensive industrialization, establishment of agricultural farms, eradication of illiteracy and unemployment, maintaining the religious balance, granting certain school or professional facilities.

The ideas promoted in the interwar period, by the national leaders from this part of Romania, the liberals Ion I.C. Brătianu (1864-1927), Vintilă I.C. Brătianu (1867-1930), the peasants Armand Călinescu (1893-1939), Ion Mihalache (1882-1965), or other militants close to them, were totally repudiated after 1947. At the same time, leftist parliamentarism has propelled it into the arena of political life. national and international, on the endocrinologist scientist Constantin I. Parhon (1874-1969), born in Campulung, Muscel, first president of the Presidium of the Great National Assembly (1947-1952), but also Nicolae Ceausescu (1818-1989), deputy from Pitesti in the supreme legislative forum of the country, for 17 years (1952-1969), the first president of the state (1974-1989).

Until 1990, Argeş was, for a long time, the fourth industrialist state of contemporary Romania, holding, for successive decades, the national monopoly of the manufacture of cars, the primordiality of the Petrochemical Platform Pitesti-Sud, the prevalence of certain processing branches, or from the fields of electricity. , forestry, fruit growing, viticulture, school construction, hospitals, apartments, large commercial complexes. As a result, from 1966, significantly, dozens of foreign delegations, from all continents, visited the city of Pitesti, considered an archetype of the application of the Doctrine of the multilateral socialist developer.[20]

5.5. Romania in the contemporary Euro-Atlantic context

After 1990, the Argesians and the Muscels have adjusted, in a relatively short time, to the principles of the individual initiative, price liberalization, market competition, the current financial system, privatization, the concepts of

continentalization. Compared to other counties, the economic and social concerns remained for almost 20 years, in general, multivalent. As proof, the restructuring of the companies did not generate an exaggerated rate of layoffs, the amount of foreign investments was constantly expressed, and the constructive pace was obvious. However, since 2005, the industrial potential of Argeş, compared to the level of 1989, has decreased considerably: the closure of large productive capacities in the Pitesti-Nord, Pitesti-Sud, Campulung, Curtea de Argeş areas, including the demolition of plants or factories ; loss of foreign markets; decrease of wage income; the exodus of the skilled labor force; bankruptcy of various small and medium-sized companies; reducing budgetary expenses. As a result, after 2010, there are few companies that undertake large-scale projects, the city of Pitesti tending to become a molded bank of domestic or international bank or commercial speculation, but less productive base. It is commendable that one of the largest state university campuses in Romania is being built here, and the city continues to transform, every spring, starting in 1978, into a capital of tulips, tourism being promoted aggressively. The political life offers various alternatives, the cultural-ecclesiastical institutions advancing differentiated projects. The severity of the world crisis of 2008-2010 was clearly expressed in Argeş-Muscel. Romania's membership in NATO (2004) and the European Union (2007) favors the optimism of overcoming uncertainties including in this part of the country.

From the perspective of regionalization, the European Charter on local autonomy, adopted in Strasbourg on October 15, 1985, makes a distinction between local and regional authorities. Defining local autonomy as "the right and the effective capacity of local public administration authorities to solve and manage, within the law, in their own name and in the interest of the local population, an important part of public affairs, the normative act contains elements of differentiation between the structures local and regional ones. In this sense, we find that the latter are much larger structures than the former, endowed with elected bodies and their own heritage.[21]

Romania signed the Charter on October 4, 1994 and ratified it by Law no. 199 of November 17, 1997 for the ratification of the European Charter of Local Self-Government, adopted in Strasbourg on October 15, 1985, published in M. Of. no. 331 of November 26, 1997. The normative act is limited to declaring that by the notion of regional authority, provided in art. 4 paragraphs 4 and 5 of the European Charter, is understood county authority of local public administration. Therefore, it is not regulated in any way what the role of the counties is or what is the relationship between them and the structures of local autonomy. For a better understanding of these aspects, it would be necessary for the Romanian legislative system to define the two concepts used in the ratification of the European Charter on local autonomy, respectively the one of regional authority and county authority, making a clearer correlation between the two concepts and a definition of their features. In other words, it is time we hit upon the fundamental question: Why are they against regionalization? And because this question is not an academic one, it is only the fruit of Alexis de Tocqueville's reflection: „A central power, however enlightened and learned it may be, cannot comprehend all the details of the life of a people" curated

in his work "On democracy in America". Rather, I think it is (regionalization) the dream of a perfectly synchronized society, similar to a clockwork mechanism, which has tormented many of the "modernizers" who influenced the industrial age. The lack of space prevents us from offering an explanation of the meaning of this parallelism. It is clear, however, that from this perspective the decision-makers are trying to discover us as something decisive by its importance. For us Romanians, regionalization is not a mere obligation assumed by treaties, it is not a custom; it is linked to the intimate secrecy of our lives. And if we consider that regionalization is often confused with regionalism, things get complicated, becoming a true regionalism v.s. regionalization.

6. Romania caught in the trap of regionalism v.s. regionalization

6.1. Specific issues

Regionalism represents the awareness of common interests (the region being perceived as a territory considered homogeneous by the people who inhabit it) and at the same time the aspiration to participate in the management of these interests. In other words, a community that considers itself capable of solving local problems to the detriment of the state, considered too remote and too large. Regionalism can be viewed as a two-way term: "a top-down movement (regionalization), and a bottom-up movement (regionalism)." Both are concepts that describe movements at the regional level, interacting with each other. However, there is a difference: „regionalism as a term encountered in the discourse of politicians, which can lead to federalization (a territorial assembly with a common history and culture that can acquire competences for public policies)" and regionalization which is "an administrative action aimed at the creation of cooperation spaces and defines new administrative-territorial units."

The regionalization has as a starting point the regional imbalances or their awareness: the state can thus recognize a regional identity (the region being this time a territory considered homogenous by the state) and can take the necessary measures for the regions to participate in managing their own businesses. Therefore, regionalization means the desire to reach a balance of economic development, by raising the level of the less developed areas, and for this, regionalism militates for the region to reach the decision-making power. Whether it is regionalism or regionalization, decentralization is the main benefit of the two terms. The decentralization that brings with it the multi-level governance process.

6.2. About multi-level governance

According to the Organization for Economic Cooperation and Development (OECD), which encourages multi-level governance, "decentralization has made local and regional governments stronger and their capacity to formulate and implement policies is supposed to increase. Local and regional governments, concerned that their economies are increasingly exposed to global competition, are now expected to

influence public policies so that they have a real and positive impact on improving the competitiveness of the regional economy and the well-being of the population."

As for the European Union's vision, on multi-level governance it is rendered by the Committee of the Regions - an advisory body representing local and regional authorities in the EU. Its role is to make local and regional views on EU law known, launching reports or "opinions" on European Commission proposals: "The Union must work in partnerships by promoting a culture of multi-level governance." Also to be considered is the Council of European Municipalities and Regions, founded in Geneva in 1951, which is the largest organization of local and regional authorities in Europe, its members being over 50 national associations of cities, municipalities and regions in 40 countries. Together, these associations represent approximately 150,000 local and regional authorities. The European Regions Assembly, founded in 1985, is the largest independent network of regional authorities throughout Europe, bringing together over 250 regions from 35 countries, together with 16 interregional organizations. They are lobbyists of local and regional interests in Brussels. Together, in December 2011, they signed the document "Governance in partnership - United to build a stronger Europe", a document that underlined, at the time, the role of multi-level governance in line with the objectives of the Europe 2020 strategy. Great Britain, with all the obstacles it has come up with, has chosen the road!

For us, article 120 of the Constitution stipulates the following regarding the decentralization of Romania: "The public administration from the administrative-territorial units is based on the principles of decentralization, local autonomy and decentralization of public services." This is the basic principle of decentralization in Romania, but in practice it is completely lacking and remains a principle only on paper. Decentralization can be a guarantee of the stability of a functioning democracy. Romania is a member of the EU, and in Europe the principle of subsidiarity is a basic term. Europe is one of the decentralized local communities, which allows for faster collaboration and development of regions and local communities. I do not know if Poland's model is the most appropriate, but their success in achieving decentralization would not have been possible without the massive support of Germany, the US. We know that Poland has a different culture and mentality as a people, it quickly went to privatization in the 1990s leading to a policy of liberalization, Poland had Solidarnosk in the 80s. What didn't happen with, or in Romania. On the other hand, they are the only country with which we can compare in many respects: geographical position, size, population, level of regional disparity like West-East.

6.3. About the regionalization of Romania, between the hammer in Budapest and the nicovala in Burxelles

In principle, Romania needs a decentralization / regionalization process in order to streamline the development needs of the regions and to give them the chance to develop at their own pace. However, this process will have to be implemented very carefully, as there is a risk that this process will lead to a

strengthening of bureaucratic procedures and at the same time to accentuate the phenomenon of corruption at local / regional level. It is the duty of the experts to propose different formulas, taking into account these risks, and which will be decided at political level: a reorganization with or without counties, what budgets, with or without direct elections, the duration of the mandates, the functional prerogatives that will be held by these regions etc. For this, a political will and a debate are needed that will generate a consensus at national level and to which all political, local and social actors will take part. From Brussels the regionalization is seen differently than from Budapest, and Bucharest has to decide what will be the way forward. Until then, there would be a need to understand and analyze the advantages / disadvantages and benefits / risks that may arise during the regionalization: a complex process of research and debate on the topic of regionalization, on the network, on multiple levels, having a period sufficient, but still limited, to give the opportunity for timely decisions at national level. The regionalization must be the consequence of the internal desire of the Romanians, implemented by the decision-makers through an authentic participatory democratic process. Until then, our attempt to address the need for interdisciplinary regionalization research that we are tempted to pursue, given that we are all interested in being best managed, is hampered by the inability of policy makers. To help them, we offer some points of possible regionalization of Romania.

6.4. Theoretical benchmarks of the process of regionalization of Romania

Even if we do not agree with the regionalization of our homeland, this fact cannot prevent the beginning of its realization. If it happens, we dare to have our opinion too, as the region has gone through several evolutionary phases, including the system-region and the development region, and has come to be considered as the most suitable operational concept for a period in which the state loses in importance through globalization. This led to the assertion that today's world is no longer a world of states but of regions, hence the idea of fragmenting Europe into regions and considering them as the basis of continental cooperation. At the same time, the new economic geography, developed after 1990 and confirmed by the World Bank report in 2009, shows that economic efficiency depends on agglomerations (Krugman, 1995; Fujita and others, 1999; World Development Report, 2009), on highly developed regions. which concentrates production. In this context, might the rich regions help the poor to develop? M. Storper (2011) asks this question, referring to the fact that in addition to economic efficiency, social justice must be added and that some "places" must help others.

The relationship between territorial cohesion and regional development is a complex one, despite an apparent simplicity: it is not entirely about a relationship of subordination, but rather of a relationship of mutual character, in which the concept of region is fundamental. Unlike the concept of regional development, outlined over several decades, the concept of territorial cohesion is a relatively new one, initially having only a social-economic connotation. Subsequently, this concept was extended to the territorial level, due to the fact that one cannot speak only of harmonious

relations between the economic branches and the social categories, but also between them, the human communities and the space where they live. However, in such a context, in order to achieve an approach congruent with what is expected in the academic plan for deciphering the mechanisms that govern territorial development, the concept of region cannot be ignored. It provides a framework that, with the benefits of decentralization, can support stronger endogenous development. It is generally accepted that the region is a vast space (the largest territorial division in a state, after E. Juillard, 1966), with many sub-regions/sub-regions located on different levels of development.

European cohesion policy and structural funds, as the main instrument, contribute to major territorial changes through regional policies. In this context, the region remains a basic concept, at which both competition and cooperation on a European scale can be promoted. European territorial development has gone through a transition period between two financial planning periods: 2007-2013 and 2014-2020. This period was one of critical analysis of the actions already taken and a period of anticipation of changes that could offer adequate solutions for the exit from the crisis and the implementation of actions more focused on results. Numerous documents, policies and implicit instruments have been conceived as support to anticipate the period from 2020-2030, the most important being the Europe 2030 Strategy, Cohesion Policy, Partnership Contract. To achieve a united Europe, where territorial cohesion is the dominant one, regional development is one of the most important objectives. All the experience gained by the countries of the European Union, including Romania, in this field has shown that a better territorial distribution of resources, together with a higher exploitation of the complex of potential elements, existing at local or supralocal level, become factors of economic growth. and social equity. For a long time, the harmonious development of all regions of a state has been discussed, taking into account their balanced development. Such a development mainly meant reaching parameters related to the development of the industry and the full use of the surplus human potential in these regions. Territorial cohesion is, however, a much more productive and comprehensive concept than balanced or harmonious development, including elements of territorial coherence and synergy.[23]

The bottom line is that the region has been and remains a framework not only for theoretical debates, but an administrative framework, adopted by many countries at European level to measure territorial disparities and to better organize the territory at the sub-national level. The results obtained, using the region as an instrument in achieving territorial cohesion, demonstrate its capacity to ensure a real development of the respective state. However, regarding the need for administrative regionalization in Romania, we have some reservations related to the concrete situation, with a general level of development well below the European average and even of the countries of Central Europe, with regional gaps that may deepen and involve adopting flexible territorial development policies, which will gradually alleviate these disparities. On the other hand, the low financial resources available to the country should be taken into account in order to induce accelerated economic growth in the lagging regions and in the proximity of the developed

regions and European countries. In such conditions, the need to redefine the regional development policy and its territorial projection emerged, taking into account, on the one hand, the particularities of the Romanian space and the progress made in implementing a development policy for at least two decades, and, on the other hand, the achievement of the objectives appeared in the new documents of the European Union along the lines of increasing cohesion at the continental level. From this perspective, we think that the reconsideration of the concept of administrative region in Romania, but especially its implementation, in the European sense, would be based on three fundamental findings:

a) The very good results obtained by some of the countries of the former communist regime, which, adopting a regional administrative framework, were able to benefit from all the opportunities offered by the EU. In such a framework, the decentralization process has been continuously improved and found in the increased capacity to meet the challenges caused by globalization, but also by the economic-financial crisis. In this case, the example of Poland is already well known. An efficient decentralization at the level of the present counties is not possible, due to their small size. Taking over many functions from the center and locating them in 42 territorial entities, would minimize the potential for cooperation and implementation of regional projects, on the one hand. On the other hand, the costs of such decentralization would be enormous, given the hypertrophy of public services at the level of each county residence.

b) The present regions of development did not have an important role, the experiment belonging to the past. Established in 1998, it has not added any coherence in the management of territorial development processes. To move to a new quality, the development regions must be transformed into administrative regions, with their own elective bodies, assuming responsibility in the regional development process. Moreover, at the Green Paper launching conference for defining the regional development policy in Romania (May 1997), it was publicly stated that the life of the development regions should not exceed 10 years. These have represented a provisional framework for the implementation of pre-accession policies in the EU, provisionally maintained and these lines will appear and which will probably have as their purpose the permanentization or disappearance.

c) Development regions cannot be considered as a form of territorial management, capable of supporting multi-level governance. In this sense, the dynamics of the social-economic life showed that the development regions, made up of associative bases, have the character of framework elements with a small role in the territorial development itself, as long as the decisions are taken in a vision in which the county is the element key and the only authorizing officer. The way in which the funds are distributed in the current development regions does not take into account the projects of inter-county character, but only locally, rarely trans-county.

Starting from these findings, it is possible to define, synthetically, some elements that demonstrate, on the one hand that this is not possible anymore (having only statistical regions, without administrative attributes), and on the other hand, that Romania must - and optimize the territorial structures in which the

development process takes place. Without imposing a certain order in relation to the importance of the arguments for the necessity of creating the regional administrative framework, we note the following:

1) After two decades of operation, the development regions could very easily see that their effectiveness was much reduced, that the definition and implementation of their own regional development policies are very difficult. This situation results from:
   - lack of inter-county projects;
   - insufficient resources for co-financing large projects;
   - inability to manage intra-regional gaps and develop interregional cooperation;
   - weak direct cooperation with the developed regions of the EU, without resorting to central structures;
   - the associative character - the splitting of the funds through projects distributed to the component counties.
2) The current moral, economic-financial and social crisis tends to accentuate the gaps - the need to optimize the decision-making and organizational flows in the territory; in the current system, the poorly developed counties have less and less chances to recover the development gaps, a fact demonstrated by the evolution of the main socio-economic indicators;
3) Low absorption rate of EU funds - the inability of counties to support large projects with regional impact;
4) Lack of regional coherence with real effects at the level of counties and localities; for example, an intermediate level of planning (between county and national level) is missing, which reduces the chances of an optimal horizontal (between county) and vertical (national - county) correlation;
5) The way of allocating the European funds in a competitive system has maintained and encouraged the county's identity, in the absence of a higher administrative structure - which also concerns the inter-county cooperation.

The present context of Romania's development has benefited from a vision defined at continental level by strategic European documents: the EU 2020 Strategy and the Territorial Agenda 2020. Their implementation has implied, objectively, the existence of administrative regions, as the basis of an authentic territorial decentralization. national level. The future seems a little optimistic from this perspective, especially since the process of territorial development has been complicated by the intervention of a wide range of actors, especially at local, supralocal and regional level, which makes impossible the ability of the "Center" to manage territorial processes.

So, it appears, again the natural question: Is the Romanian society connected at the time of the transition to the administrative regions? For a good part of the population and actors of the economic-social and political life, the current moment of crisis is considered to be inadequate, as the territorial development can benefit from the current status of the regions, with their development agencies, which are considered capable of manage the funds accessed from the EU.[24]

Obviously, not the European Union obliges us to improve the territorial framework of governance, on the contrary, we could say that some states would be interested in accessing only a small part of the funds. Through the new incentive tool, the states that manage to attract the allocated money, can receive through redistribution the amounts that have not been attracted by other states. Therefore, it is very important for each state to improve its tools and internal capacity to absorb all the money that it owes and, if possible, to even benefit from situations like the one described above. Let us not forget that the second largest financial contributor, said goodbye to Brussels, and not to the Europeans. Considering the above and the fact that the national development funds spent did not have the effect of amplifying the benefits, but on the contrary had only very limited effects, we consider that this is the best time to achieve a viable regional administrative construction and with immediate utility. For this, the following must be considered:

- Facilitating access to the funds allocated by the EU in the financial year 2021-2027 and increasing their absorption capacity at regional level;
- Failure to achieve this framework would now delay the establishment of administrative regions for the next financial year of the EU itself;
- Territorial institutional reconstruction, so that the regions can have decision-making capacity and competences similar to the regions of most European states;
- The intensification of interregional cooperation at European level and the need for urgent inclusion of the regions of Romania in such networks;
- Romania is the only member state, larger than the EU average, which has no administrative regions;

Apart from the ones mentioned above, the current moment is extremely favorable, because it is coupled with two necessary conditions and less commonly encountered in the political evolution of a society:

a) Organizing the Referendum for the Constitution - the unique possibility to state the regions as administrative territorial entities;
b) The beginning of a government represents another opportunity to align the administrative-territorial structure of Romania with the new perspectives of development in the EU.

The bottom line is that any delay would bring damage that is difficult to assess at this time. The costs of implementing such a structure are estimated to be very low, because decentralization cannot be done immediately after the administrative framework is established, but it is strengthened as the institutions specific to the different levels of governance are built.

Finally, the process of territorial definition and delimitation of administrative regions should be based on well-defined principles, criteria and indicators that start from the fundamental idea that they do not represent the current result of the spatial distribution of "development", which does not mean revitalization. some forms of territorial administration that were effective in certain historical periods, but which represent a framework for the future spatial projection of development. In other words, the construction of the new administrative regions aims to easily

reach long-term and ultra-long-term development targets. Then, it is built on the evidence that an administrative region must be built on a multicriteria basis. All the regionalizations that were based on single-criteria analyzes did not resist, which is why the sustainable regions, with beneficial effects on the space, are those that are based on several criteria covering a large part of the diversity of the regional components. Another important issue is the one based on the fact that the counties have proven effective throughout history and that these, in the regional construction, must be adopted as such. Therefore, the future administrative regions will be groupings of counties, on a multicriteria background.

Apart from these general principles, we can identify several guiding principles, which are essential for the regionalization process. Synthetically, these are the following:

- the functionality, meaning the assurance of a "freedom" of movement of the material and information flows, which will ensure the synergistic development of all the component counties and their assembly;
- complementarity, representing the essence of the functionality through the variety of resources and functions held by the localities and territorial subsystems;
- solidarity, resulting from a spirit of social equity between places and sub-regions; such a principle is built in time, as the rich and poor areas of a region are aware that they must cooperate to develop together and avoid the emergence of conflict-generating phenomena;
- the diversity results from the variety of the natural, economic, social and cultural potential of the future region, all contributing to the morphogenesis of territorial relations of dependence, which will converge towards functionality and solidarity;
- competitiveness is a regional goal, which can be achieved under the conditions of clear individualization of assets and territorial excellence; q This principle will have to maximize the potential of intelligence and cooperation within the created regional framework;
- the expected administrative effectiveness is based on a relatively equal accessibility for all the inhabitants of a region, on a system of competences based on undivided responsibility.
- the contiguity, respectively the need to ensure a territorial continuity, which will ensure the optimum functionality and connectivity of all the components of the region. It is also avoided to create regions that contain enclaves that can fragment the regional territory and internal flows.[25]

There would be more to discuss, but we leave to the various specialists the further investigation of the process of regionalization in Romania, but we must not forget that everything done by the human hand is satirical, only God is eternal, eternal! So, we dare to conclude our scientific research project with a few conclusive formulations.

7. Conclusions

Compared to the previous ones, we can conclude that the Romanian legislation is deficient in terms of regulating the concept of region. Moreover, although this notion was legally regulated at one point in the history of the Romanian state, both its meaning and its defining characteristics were completely different from the way in which the notion of region at European level is regulated today. Thus, not only is the region currently understood as a territorial administrative unit of its own, with legal personality, its own governing bodies and its own heritage, but its main features are represented by a strong degree of decentralization and local autonomy. Thus, the regionalization done in Romania in 1950, in the Stalinist era, is in antithesis to what today means a process of regionalization, since at that time it was intended to exercise as much control of the central power over the local administration. As a consequence, the legal regulation of the notion of region at that time can in no way serve as a standard for a current legislative consolidation. Only if we do not consider that the USSR since then is the EU today! Or vice versa! Nothing is new under the sun, says the Ecclesiastes!

Considering that a possible territorial administrative reorganization must provide a functional system, which can be implemented with the minimization of the possible negative effects on various plans, in order not to create larger imbalances than the ones existing at present, it will be a real challenge for the Romanian legislator creating an adequate legislative framework. Rather, we support the elements of Professor Cătălin Vrabie on e-government - a concept also known as e-gov e English - as one of the most interesting challenges of public administration worldwide.[26] Therefore, we wanted the pages under the eyes of the approved reader to be realistic and balanced, dissociated, as far as possible, by political connotations, subjectivism, collateral influences. We support, in principle, the conception of the American analyst Charles Beard, who concludes: "History must be, first and foremost, a son of its time." We hope to successfully integrate the a priori non-biased meanings, formulated through the diversity of stories, many with a certain degree of novelty and originality. In this regard, in addition to the bibliography read or the archival funds consulted, a special role was played by discussions held directly with specialists in the fields of activity. The last aspect supposes both the moral assumption of the authenticity of the related ones, as well as the provision of certain essential details, necessary for the future researchers, exempted from the efforts made by our efforts. Therefore, preserving, including by this way, the essence of the evolution of the Argeș-Muscel area over the last half century, we will maintain, with certainty, the perpetual secular sustainability of everything around us. Moreover, we dare to say, for Romania, our blessed part of God, so often and so tried in its tumultuous and millennial history.

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Mai ciudat decât ne putem imagina: evoluția/involuția istorică a regiunii în dreptul românesc. Cu privire specială asupra spațiului geo-istoric Argeș-Muscel

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Abstract

Societatea umană a trecut, în epoca modernă, prin schimbări majore în plan politic, social, cultural și economic. Aceste transformări, care au cunoscut un ritm accelerat în secolul XX și care continuă în secolul XXI, au condus omenirea spre mai bine. Viața comunităților și a indivizilor a fost în general îmbunătățită. Au fost eliminate, în multe părți ale lumii, nedreptăți și inechități profunde, prin asigurarea unor drepturi fundamentale și prin salturi calitative ale vieții. În același timp însă, acest context a adus cu sine coagularea unor curente care subminează valori fundamentale ale societății umane. Secularismul agresiv, tendințe radicale de redefinire a familiei, marginalizarea valorilor moral-creștine sunt o realitate manifestă. Societatea românească nu a rămas izolată de aceste evoluții. Ieșită dintr-o lungă perioadă totalitară, România și locuitorii săi încă luptă pentru regăsirea de sine, pentru redescoperirea acelor valori comune, care fac parte din țesătura sa intimă, precum, în cazul demersului nostru de cercetare științifică, organizarea administrativ teritorială.

Cuvinte cheie: *România, Uniunea Europeană, drept administrativ, regiune, regionalizare, suveranitate.*

1. Introducere

Societatea umană a trecut, în epoca modernă, prin schimbări majore în plan politic, social, cultural şi economic. Aceste transformări, care au cunoscut un ritm accelerat în secolul XX şi care continuă în secolul XXI, au condus omenirea spre mai bine. Viaţa comunităţilor şi a indivizilor a fost în general îmbunătăţită. Au fost eliminate, în multe părţi ale lumii, nedreptăţi şi inechităţi profunde, prin asigurarea unor drepturi fundamentale şi prin salturi calitative ale vieţii. În acelaşi timp însă, acest context a adus cu sine coagularea unor curente care subminează valori fundamentale ale societăţii umane. Secularismul agresiv, tendinţe radicale de redefinire a familiei, marginalizarea valorilor moral-creştine sunt o realitate manifestă. Societatea românească nu a rămas izolată de aceste evoluţii. Ieşită dintr-o lungă perioadă totalitară, România şi locuitorii săi încă luptă pentru regăsirea de sine, pentru redescoperirea acelor valori comune, care fac parte din ţesătura sa intimă, precum organizarea administrativ teritorială. Din această identitate comună face parte, la loc de frunte, istoria noastră, împărtăşită de un procent covârşitor dintre cetăţenii României, întreţesută în ethosul nostru naţional şi care influenţează manifestările sociale, culturale şi politice ale românilor, fiind reperul la care ne raportăm ca la un standard comun, atemporal şi absolut.

Pornind de la aceste considerente, din multitudinesa de probleme, încercăm să configurăm, în demersul nostru de cercetare ştiinţifică evoluţia istorică a conceptului de regiune. Termenul vine de la cuvântul „regere" care înseamnă a stăpâni, a diviza. E. Reclus îl definea ca un spaţiu care serveşte ca bază pentru divizarea administrativa a statelor-naţiuni. Plecând de la regiunile naturale, la regiunile omogene, istorice, culturale, s-a ajuns la regiunea funcţională, inclusă ulterior în teoria spaţială şi în dezvoltarea regională, inclusiv creşterea economică. Teoria polilor de creştere, fundamentată în anii '50, a realizat legătura dintre dezvoltarea oraşelor şi regiunilor, polul de creştere fiind privit ca o unitate economică în măsură să inducă schimbări structurale regionale, regăsite în rata creşterii şi în creşterea producţiei regionale. Într-un secol, evoluţia conceptului de regiune a condus la înţelegerea că în spatele acestui cuvânt larg folosit, de multe ori excesiv, se află o realitate geografică, economică, umană, culturală şi istorică. Relativitatea noţiunii de regiune depinde de scara de raportare, de aceea geometria variabilă a termenului a determinat numeroase contestări, mai ales în anii '70 şi '80, fiind propuse alte concepte, precum zona, spaţiul funcţional, spaţiul macrofuncţional. Din aceeaşi perioadă datează o nouă revigorare a preocupărilor privind conceptul de regiune, legat de dezvoltarea regională. Regiunea trecând prin mai multe faze de evoluţie, inclusiv prin cea de regiune-sistem şi de regiune de dezvoltare, ajunge să fie considerată ca noţiunea operaţională cea mai adaptată unei perioade în care statul pierde din importanţă, prin globalizare. Aceasta a condus la aserţiunea că lumea de astăzi nu mai este o lume a statelor ci a regiunilor, de unde şi ideea de fragmentare a Europei în regiuni şi considerarea acestora ca bază a cooperării continentale. În acelaşi timp, regiunea poate fi un cadru de analiză şi de dezvoltare diferenţiată pentru reducerea inegalităţilor la nivelul unui stat sau a unei părţi din continentul european. Regiunea este o structură conceptuală şi de aceea înţelesul ei poate varia de la o cultură la alta şi între membrii diferitelor comunităţi iar coagularea juridică a urmărit contextul istoric, intern şi extern, al evoluţiei României.

2. Despre evoluţia organizării administrativ-teritoriale a României în perioada interbelică

Deşi primele reglementări în materia organizării administrativ-teritoriale debutează în anul 1864, odată cu Legea nr. 394 din 31 martie 1864 pentru comunele urbane şi rurale şi Legea nr. 396 din 31 martie 1864 pentru consiliile judeţene, statul naţional unitar român a fost consolidat abia în anul 1918, când a fost înfăptuită Marea Unire. Acest eveniment a marcat desăvârşirea unităţii statale şi naţionale prin înfăptuirea unirii Vechiului Regat al României cu provinciile istorice Bucovina, Basarabia şi Transilvania. Din punct de vedere administrativ teritorial, provinciile istorice nou integrate erau organizate conform legislaţiei specifice statului din care au făcut parte, ce a rămas temporar în vigoare. Astfel, în perioada cuprinsă între Marea Unire, ce a avut loc la 1 decembrie 1918 şi până la momentul votării Legii pentru unificarea administrativă, la 14 iunie 1925, pe teritoriul României au funcţionat 4 regimuri administrative, respectiv: austriac, maghiar, rus şi cel din vechiul regat, fiecare având caracteristici proprii.[1]

Întrucât aceste regimuri administrative au fost adoptate sub imperativul unor sisteme şi împrejurări diferite, cele patru decupaje administrative prezentau caracteristici proprii, raportat la realitatea politică şi socio-economică a fiecărui ţinut, caracteristici ce au indus la nivelul întregii ţări dezechilibre semnificative. În perioada imediat următoare, principala preocupare a legiuitorului a fost aceea de a asigura unitatea de reglementare pe planul dreptului constituţional şi pe cel al dreptului administrativ, deoarece ea viza în mod nemijlocit organizarea puterii şi a administraţiei de stat. În ceea ce priveşte mijloacele de realizare a unificării legislaţie au fost identificate două posibile variante: fie extinderea aplicării legislaţiei existente în Vechiul Regat al României şi în provinciile istorice, fie elaborarea unor noi acte normative, care să le înlocuiască pe cele existente, prin sintetizarea celor mai bune reglementări ale fiecărei ramuri de drept. Principalul avantaj al extinderii legislaţiei existente în Vechiul Regat al României consta în faptul că ar fi asigurat un ritm rapid al unificării legislative, realizându-se astfel o integrare imediată a provinciilor istorice. Pe de altă parte, legislaţia era adaptată nevoilor sociale, politice şi economice existente pe teritoriul Vechiului Regat, nevoi diferite de cele existente în noile provincii, aspect ce ar fi fost susceptibil de a crea serioase dezechilibre.[2]

Unificarea legislaţiei prin cea de-a doua metodă crea premisele unei legislaţii superioare atât din punctul de vedere al tehnicii legislative, cât şi al conţinutului. Aceasta metodă presupunea însă o perioada mult mai îndelungată de timp, în care să fie studiate sistemele legislative existente, pentru identificarea şi sintetizarea părţilor utile din fiecare sistem în parte. În cele din urmă, ambele metode au fost folosite în procesul de unificare legislativă, fiind aplicată extinderea în anumite ramuri ale dreptului (dreptul constituţional, dreptul civil, dreptul penal, dreptul procesual penal) şi elaborarea de noi acte normative în celelalte ramuri (dreptul financiar). În ceea ce priveşte organizarea administrativ teritorială a României, s-a încercat crearea unui nou act normativ, ce s-a dovedit a fi, în final, o extindere a legislaţiei existente în Vechiul Regat. De-a lungul istoriei, statul român a trecut printr-o multitudine de reforme administrative, cunoscând astfel diverse forme de

organizare administrativ teritorială, implementate printr-o succesiune de acte normative.

Primul act normativ de după înfăptuirea Marii Unirii, care reglementa organizarea administrativ teritorială a statului român nou format a fost Legea pentru unificarea administrativă din anul 1925, ce era o materializare a proiectului legislativ elaborat de către liberalii care se aflau la guvernare la acea vreme. Aceasta împărţea teritoriul României în judeţe, comune urbane şi rurale şi plăşi, conferind primelor două personalitate juridică. La scurt timp după adoptarea acestui prim act normativ de organizarea administrativ teritorială a statului român nou format, urmare a venirii la guvernare a ţărăniştilor, a fost elaborat un nou proiect legislativ care prevedea o reorganizare. Acest proiect a fost dezbătut şi adoptat de către Parlament la data de 4 august 1929, materializându-se prin Legea pentru organizarea administraţiunii locale, care introducea pentru prima dată directoratele ministeriale, în scopul descentralizării puterii centrale şi stabilirii a unor structuri regionale superioare. Legea reînnoia ideea regiunilor istorice organizând teritoriul ţării în 7 directorate ministeriale denumite după oraşele alese centre administrative: Bucureşti, Cernăuţi, Chişinău, Cluj, Craiova, Iaşi şi Timişoara.[3]

Ultima reformă administrativă, până la izbucnirea celei de-a doua conflagraţii mondiale, a fost realizată după instaurarea regelui Carol al II-lea, sub regimul noii Constituţii din 27 februarie 1938, când a fost adoptată Legea administrativă din 14 august 1938, act normativ ce introducea o nouă unitate administrativ teritorială, pe lângă cele existente, respectiv ţinutul. Împărţirea pe ţinuturi, a fost similară cu directoratele ministeriale, însă abordarea era diferită, întrucât nu se ţinea cont de provinciile istorice în delimitarea acestora iar motivaţia avea la bază o declaraţie cu privire la nevoile reale ale locuitorilor înfrăţiţi ai României noi.[4] Cele 10 ţinuturi nou înfiinţate aveau statutul de unităţi administrativ - teritoriale cu personalitate juridică şi atribuţiuni economice, culturale şi sociale, iar administraţia acestora era încredinţată unui rezident regal. În anul 1940, în contextul pierderilor teritoriale din acel an, s-a revenit la împărţirea statului român în judeţe şi comune, ca unităţi administrativ – teritoriale cu personalitate juridică, patrimoniu şi buget propriu.[5]

3. Reglementarea juridică a regiunii în istoria statului român

Deşi conceptul de regiune şi fenomenul de regionalizare apar ca o noutate în dreptul românesc, acestea nu sunt cu totul străine de evoluţia istorică a statului român. De-a lungul timpului, au fost propuse mai multe proiecte de organizare a administraţiei locale ce cuprindeau, printre altele, şi înfiinţarea regiunii ca unitate administrativ teritorială, dintre care amintim următoarele:

- În anul 1862 Barbu Catargiu a propus împărţirea Principatelor Române în patru regiuni, respectiv Moldova de Sus, Moldova de Jos, Muntenia şi Oltenia.[6]
- Proiectul a fost reluat în anul 1912 de către Petre P. Carp, care a propus împărţirea României în şase circumscripţii regionale[7].

- Aceeaşi idee a fost reluată şi în anul 1921 de către Constantin Argetoianu, în al cărui proiect de organizare a administraţiei locale se regăsea şi înfiinţarea a nouă regiuni[8].
- Şi în cadrul dezbaterilor Parlamentare asupra Legii pentru organizarea administraţiei locale din 1929 a fost luată în discuţie organizarea regională a teritoriului românesc.
- În ciuda faptului că de-a lungul anilor au fost numeroase discuţii şi proiecte de regionalizare, abia în anul 1948 regiunea cunoaşte o consacrare constituţională în România, când este recunoscută ca fiind o unitate administrativ teritorială alături de comune, plăşi şi judeţe. Ulterior, în urma unei noi reforme administrative generate de venirea la putere a unui guvern pro – sovietic, de sorginte iudeobolşevică, şi instaurarea regimului comunist, teritoriul românesc cunoaşte o nouă împărţire. Astfel, au fost desfiinţate judeţele, iar Legea nr. 5 din 7 septembrie 1950, act normativ care se caracteriza printr-un centralism desăvârşit, împărţea teritoriul României în regiuni, oraşe, raioane şi comune. Sursa de inspiraţie a acestei împărţiri administrativ-teritoriale a fost reprezentată de modelul sovietic, iar noutatea au constituit-o cele două unităţi administrativ-teritoriale, identice cu cele existente pe teritoriul U.R.S.S., respectiv regiunile şi raioanele, create în vederea exercitării unui control mult mai mare al puterii centrale asupra administraţiei locale. Principalul scop declarat al reformei administrative era dezvoltarea economică. Aşadar, noua împărţire administrativ teritorială nu ţinea cont de regionarea istorică, ci avea la bază criteriul economic, noile unităţi administrative fiind considerate „unităţi teritoriale operative din punct de vedere economic, politic şi administrativ”[9]. Mai mult, din perspectivă politică, între anii 1952-1968, în centrul României a existat o regiune autonomă maghiară, înfiinţată după model sovietic. A fost un experiment impus de dictatorul sovietic Stalin la presiunea liderilor comunişti de la Budapesta, printr-o constituţie formulată la Moscova. În acest sens, în 1950, în România a avut loc prima reorganizare administrativă postbelică după modelul sovietic. Astfel, cele 58 de judeţe au fost transformate în 28 de regiuni şi 177 de raioane. Doi ani mai târziu, în urma modificării legii, are loc o primă reorganizare a acestui sistem, în urma căreia prin comasarea a zece raioane din fostele regiuni Mureş şi Stalin, se înfiinţează Regiunea Autonomă Maghiară. Regiunea Autonomă Maghiară a existat în forma respectivă până în anul 1960. Reşedinţa regiunii a fost la Târgu Mureş, iar teritoriul său cuprindea o suprafaţă similară cu cea a actualelor judeţe Covasna şi Harghita, precum şi partea de est a judeţului Mureş. Regiunea avea aproximativ 13.550 km^2 şi o populaţie de cca. 730.000 locuitori în special de etnie maghiară. Limbile oficiale ale regiunii au fost româna şi maghiara. Înfiinţarea Regiunii Autonome Maghiare a fost un simplu experiment politic a cărui mentalitate se încadrează perfect în modelul sovietic, pe care niciun stat cu democraţie populară din sfera de influenţă a Moscovei, nu îndrăznea să-l eludeze.

În cadrul acestui model impus şi cu ajutorul cozilor de topor autohtone, a fost creat şi cadrul juridic adecvat, potrivit căruia regiunea era o unitate administrativ-economică delimitată teritorial, pe care se sprijineau direct organele centrale de Stat în înfăptuirea politicii Partidului. Regiunea se afla în directă subordine a organelor centrale ale Statului şi se compunea din raioane şi oraşe de subordonare regională (acele localităţi, care, din punct de vedere economic şi politic, prezentau o importanţă deosebită pentru întreaga regiune). Raionul era o unitate teritorială, operativă din punct de vedere economic, politic şi administrativ. Acesta se subordona regiunii şi era alcătuit din oraşe de subordonare raională (acele localităţi, care, din punct de vedere economic şi politic, prezentau o importanţă deosebită pentru întregul raion) şi comune. Aşadar, noţiunea de regiune era caracterizată de un centralism puternic, fiind considerată un instrument prin care puterea centrală exercita controlul asupra autorităţilor locale.

După revenirea la formele de organizare administrativ teritorială de dinaintea regimului comunist, respectiv judeţul şi comuna, şi până la adoptarea Legii nr. 151/1998 privind dezvoltarea regională în România, noţiunea de „regiune" nu a mai cunoscut nicio consacrare legislativă. Actul normativ anterior menţionat nu a creat însă o nouă unitate administrativ teritorială în România, ci regiuni de dezvoltare constituite prin asocierea voluntară a acestora, scopul fiind unul exclusiv economic. Se impune a fi remarcat faptul că noţiunea de regiune şi conceptul de regionalizare au cunoscut în dreptul românesc o cu totul altă semnificaţie decât cea la nivel european. În timp ce în jurul conceptului românesc de regionalizare se învârtea ideea declarată a accesului cetăţenilor la conducerea treburilor publice locale, scopul realmente urmărit fiind unul predominant politic, de control al puterii centrale asupra administraţiei locale, la nivel european au stat la bază considerente economice. În state precum Franţa sau Italia, spre exemplu, motorul regionalizării a fost scoaterea statului din criza economică, prin crearea unei structuri intermediare care să permită factorilor economici un acces mult mai facil la procesul participativ de luare a deciziilor. În România, pe de altă parte, toată argumentaţia adusă în favoarea regionalizării are un caracter predominant politic, fără a se avea în vedere latura economică şi realitatea noastră actuală, apartenenţa la spaţiul euro-atlantic.

4. Scurtă analiză a realităţii actuale

Constituţia în vigoare la momentul actual în România nu face nicio referire la regiuni, ci la conceptul de descentralizare. Pentru o mai bună înţelegere a terminologiei constituţionale se impune a fi făcută o analiză juridică a unor noţiuni diametral opuse, respectiv centralizarea şi descentralizarea, dar şi a principiului autonomiei locale. Centralizarea este acel sistem care deşi recunoaşte existenţa unui interes local, nu asigură mecanismele de promovare al acestuia din punct de vedere organizatoric şi funcţional. Din punct de vedere organizatoric, centralizarea se transpune printr-o subordonare ierarhică a autorităţilor locale faţă de autorităţile centrale, iar din punct de vedere funcţional, prin faptul că actele de decizie sunt emise de către autorităţile centrale şi puse în executare de către cele locale. Aşadar, autorităţile publice locale nu dispun de iniţiativă în ceea ce priveşte promovarea

intereselor colectivităţilor locale. Chiar şi atunci când sistemul legislativ conferă anumite atribuţii în acest sens, acestea sunt limitate şi, pe cale de consecinţă, nu oferă o reală posibilitate de afirmare a identităţii colectivităţilor locale.

Descentralizarea este acel sistem care are la bază recunoaşterea interesului local, distinct de cel naţional, colectivităţile locale dispunând atât de structuri organizatorice, cât şi de un patrimoniu propriu, în vederea realizării interesului local. Fundamentul descentralizării este unul atât politic, cât şi administrativ. Pe de-o parte, la nivel politic, descentralizarea are menirea de a asigura participarea cetăţenilor la conducerea colectivităţilor locale prin intermediul autorităţilor locale alese de aceştia. Pe de altă parte, la nivel administrativ, descentralizarea are la bază principiul potrivit căruia autorităţile alese de cetăţeni ar trebui să cunoască cel mai bine necesităţile locale şi să întreprindă măsurile necesare pentru realizarea lor. Descentralizarea este indisolubil legată de autonomia locală, în doctrina de specialitate fiind conturată opinia conform căreia autonomia locală constituie un drept, iar descentralizarea administrativă reprezintă un sistem ce o presupune[10].

Această afirmaţie nu face altceva decât să desemneze dreptul autorităţilor locale de a avea competenţe decizionale în ceea ce priveşte problemele de interes local. Astfel, principiul autonomiei locale ar putea fi definit ca reprezentând capacitatea colectivităţilor locale de a-şi gestiona interesele şi problemele locale după propria raţiune, fără intervenţia autorităţii centrale, dar prin respectarea prevederilor legislaţiei emise pentru domeniul în dezbatere[11]. Absenţa unei reglementări la nivel constituţional a regiunii nu interzice crearea unor asemenea structuri, care ar conferi un grad ridicat de descentralizare statului român. Acest proces, însă, ar fi unul laborios care ar presupune în primul rând crearea unei baze legale care să asigure implementarea unui nou model administrativ. Mai mult decât atât, reorganizarea administrativ teritorială trebuie să asigure un sistem funcţional şi viabil. Pe cale de consecinţă, schimbarea nu poate fi una bruscă, ci trebuie făcută etapizat astfel încât să asigure preluarea şi adaptarea conceptelor vechi, dar şi implementarea celor noi cu o maximă eficienţă pentru a nu crea o instabilitate administrativă, care ar conduce inevitabil la una economică şi socială. Acum, după aceste scurte consideraţii teoretice, utile din punct de vedere terminologic, să zăbovim asupra unei zone extrem de dragă mie, spaţiului geo-istoric Argeş-Muscel, acolo unde am văzut lumina zilei, examinând coordonatele temporale ale pământului care a dat primele capitale ale patriei noastre.

5. Despre spaţiului geo-istoric Argeş-Muscel

5.1. Chestiuni precizatoare

Cu privire la scrierile aferente spaţiului geo-istoric Argeş-Muscel, evidenţiem, prevalent, demersurile aparţinând tradiţionalităţii. Asemenea volume, având conţinut diversificat, ilustrează, prin raportare la nivelul informaţiilor cunoscute, aspecte istorice, geografice, lingvistice, economice sau demografice, rolul unor personalităţi originare din această parte a României, alte detalii valoroase. Dintre autorităţile în materie, care au analizat realităţi specifice zonei amintite,

nominalizăm: Nicolae Iorga, George Ioan Lahovari, Constantin D. Aricescu, Constantin Giurescu, Aurelian Sacerdoţeanu, Constantin Alessandrescu, Dan Simonescu, Gheorghe Pârnuţă, Augustin Z.N. Pop, Dan Zamfirescu. La rândul lor şi unii autori locali s-au oprit asupra domeniilor preferate.[12]

Potrivit *Enciclopediei Argeşului şi Muscelului, I, Piteşti, 2008-2014,* „actualul judeţ Argeş, denumire suprapusă legendarului hidronim antic *Ordessos/Argesis*, are, prin unirea cu Muscelul, din 1950, statistic, suprafaţa de 6 826 km^2, ceea ce reprezintă, aproximativ, 2,9% din teritoriul de astăzi al României, iar numărul locuitorilor se cifrează, în medie, la 645000 de persoane. Are trei municipii, patru oraşe, 95 de comune fiind un cunoscut areal istoric, economic, cultural, social, spiritual, turistic. După 1 ianuarie 2007, face parte din Euroregiunea Muntenia Sud". Reşedinţă oficială, municipiul Piteşti, a fost atestat printr-un document scris (20 mai 1388), purtând *pecetea* lui Mircea cel Bătrân (1386-1418). La Curtea de Argeş şi Câmpulung, foste capitale domneşti, se află importante necropole voievodale şi regale. Prima referire la fostul judeţ Argeş datează, se pare, de la 13 august 1437. Consemnarea, reprodusă în *Documenta Romaniae Historica*, *B, Ţara Românească, Volumul I*, Bucureşti, 1966, aminteşte, la pagina 50, de „*Lănjeşti din Arghis*", din actuala localitate Lunca Corbului (Argeş). Chiar grafica din vechea stema tradiţională a Judeţului, astfel cum este reprodusă în *Enciclopedia României, Bucureşti, 1938, p. 33*, ne documentează faptul că „Judeţul Argeş face parte din judeţele de munte. El se găseşte în N V Munteniei, pe valea superioară a Argeşului şi pe vechiul drum care, venind din Ardeal, pe la Turnu - Roşu, ajungea la fosta reşedinţă a voievozilor, Curtea de Argeş. Şi azi acest drum este cel mai scurt între Sibiu şi actuala Capitală a ţării. Stema: scut albastru, cu o acvilă de aur, luându-şi zborul de pe un munte verde cu trei piscuri simbolizează întinderea stăpânirii voievozilor din Argeş, peste întreg cuprinsul Ţării Româneşti".

În ceea ce priveşte denumirea de *Muşcel* este ulterioară: 30 aprilie 1536, pe timpul domnului Radu Paisie/Petru de la Argeş (1535-1545). A existat, temporar, în acest areal, judeţul *Pădureţ*, notificat, la 19 iulie 1498, în vremea domnului Radu cel Mare (1495-1508), contopit apoi cu Muşcelul. Conform *Enciclopediei României*, Bucureşti, 1938, p. 290, „Judeţul Muscel face parte din judeţele de munte ale Munteniei şi este aşezat în N V acestei provincii pe vechiul drum care, venind din Ardeal, peste pasul Branului, trecea, prin depresiunea Câmpulungului şi ajungea, peste culmi şi curmături, în Valea Argeşului, la capitala de pe vremuri, Curtea de Argeş. De aici, strânsele legături pe care le-a avut acest judeţ totdeauna cu Transilvania, mai mult poate decât cu restul ţării. Stema: scut albastru, cu o acvilă de aur, cu ciocul şi ghearele roşii, stând pe o ramură verde de stejar simbolizează începuturile domniei Ţării Româneşti în acest judeţ. Este vechea stemă heraldizată".

De-a lungul secolelor, evoluţia generală a zonei Argeş-Muscel a fost apropiată ca sens demografic, economic, social, cultural, religios. Cele două entităţi sunt definite medieval şi redimensionate prin legislaţia din 2/14 aprilie 1864, elaborată pe timpul lui Alexandru Ioan Cuza (1859-1866), având ţinuturi, plase, comune urbane sau rurale, sate. Conform organizării teritoriale hotărâte de suveranul României, Carol II (1930-1940), judeţele Argeş şi Muscel au devenit parte componentă a Ţinutului Bucegi, condus de la Bucureşti (1938-1940), iar în etapa

1940-1944, erau integrate Regiunii IX, structură condensată criteriilor militare, stabilite de conducătorul statului, Mareşalul Ion Antonescu (1882-1946). La 30 noiembrie 1944, România avea 58 de judeţe. Unele aşezări argeşene sudice aparţineau judeţului Teleorman.

Pe baza Legii nr. 5, din 6 septembrie 1950[13], marea majoritate a localităţilor din Argeş, Muscel, Olt, Vâlcea au format Regiunea Argeş (1950-1952; 1961-1968)/Regiunea Piteşti (1952- 1961). Se împărţea în raioanele: Băbeni-Bistriţa, Costeşti, Curtea de Argeş, Drăgăneşti Olt, Drăgăşani, Găeşti, Horezu, Muscel, Piteşti, Potcoava, Râmnicu Vâlcea, Slatina, Topoloveni, Vedea, însumând 15 800 km^2, 356 de comune, 1 533 de sate. De la 1 ianuarie 1961, Băbeni-Bistriţa şi Topoloveni se desfiinţau, urmate, în scurt timp, de Vedea.

Prin Legea Nr. 57, din 16 februarie 1968[14], se revenea la organizarea administrativă pe judeţe. Comparativ însă cu situaţia tradiţională, Argeşul şi Muscelul rămâneau unite, situaţie care se menţine inclusiv astăzi, dureros pentru noi, muscelenii, care, prin desfiinţarea judeţului Muscel, am rămas fără patrie.

Din punct de vedere geografic, înălţimile munţilor Făgăraş, din Carpaţii Meridionali, unesc Argeşul, la nord, cu judeţele Sibiu şi Braşov; crestele semeţe ale Masivului Leaota, dealurile din Podişul Getic şi o parte din Câmpia Română constituie puntea de est cu judeţul Dâmboviţa; Câmpia Găvanu-Burdea îl mărgineşte, la sud şi sud-est, cu judeţele Teleorman şi Olt; cumpăna de ape, dintre râurile Argeş şi Olt, îi conferă vecinătatea, spre vest, cu judeţele Vâlcea şi Olt. Relieful, asemănător unui uriaş amfiteatru, se descifrează, predilect, de la nord spre sud, de la Vârful Moldoveanul (2 543 m), până la şesurile aluvionare. Ţinuturile piemontane ocupă mai mult de jumătate din teritorialitatea amintită anterior. Pe văile săpate de ape în munţi şi dealuri, pe frumoasele plaiuri şi muscele, de-a lungul drumurilor şi şoselelor, precum şi în plină câmpie, s-au constituit, de timpuriu, trainice aşezări. Viaţa materială şi spirituală din Argeş-Muscel a urcat, prin secole şi milenii, o dată cu evoluţia neîntreruptă a celorlalte pământuri tradiţionale. Nu este zidire mai veche sau mai nouă, din acest areal, care să nu amintească personalitatea poporului român, strădaniile sale pentru independenţă, unitate, progres, civilizaţie. Aici a fost *Ţara Ctitoriei*, leagănul formării statului feudal primordial, numit, frecvent, *Muntenia* sau *Valahia*, aici s-au aflat primele reşedinţe princiare, de la Curtea de Argeş şi Câmpulung, de aici s-a emis prima stemă a Basarabilor, simbolizând începuturile domniei dinastice şi întinderea stăpânirii sale, în veacul XIV, peste toată geografia neatârnată, inclusiv la nordul Gurilor Dunării.

5.2. Rolul zonei Argeş-Muscel în vremea Evului Mediu

Eforturile pentru menţinerea structurilor noastre medievale s-au centrat, deseori, pe aceste locuri. Astfel, la 12 noiembrie 1330, voievodul Argeşului, Basarab I *Întemeietorul* (c. 1310-1352), a obţinut victoria emblematică de la Posada, din *pripoarele* Perişanilor, despre care va aminti inclusiv cronicarul Martin Strykowski din Polonia: *„Regele ungur Carol, ridicând război năprasnic asupra domnului muntean Basarab, fu bătut cu desăvârşire ... astfel încât cu puţini ai săi abia a scăpat cu fuga*". La 10 octombrie 1394, oastea condusă de voievodul Mircea cel Bătrân s-a

confruntat cu armatele legendarului sultan Baiazid (1389-1402), oştirea română obţinând la Rovine, undeva, pe *Câmpia de la sud de Piteşti*, după cum opinează mulţi analişti ai perioadei, un succes răsunător. *„A fost război mare*, notează, în 1620, călugărul erudit Mihail Moxa, *cât se întuneca văzduhul de mulţimea săgeţilor ... şi mai pierdu Baiazid oastea lui cu totul*". La Curtea de Argeş, domnul Nicolae Alexandru (1352-1364) a înfiinţat prima mitropolie ortodoxă a Munteniei (1359). Documente ale secolului XVI au consemnat aspecte importante referitoare la rolul zonei Argeş-Muscel în vremea domnului Neagoe Basarab (1512-1525), cel care ne-a lăsat, printre altele, Biserica Episcopală de la Curtea de Argeş, aureolată cu *Balada Meşterului Manole*, precum şi celebrele texte filosofale reunite sub genericul *Învăţăturile*. Apoi, pe timpul voievodului Radu de la Afumaţi (1522-1525), una dintre cele 19 lupte ale sale cu turcii era purtată la Rucăr, pe drumul spre Braşov (1522). Deosebite sunt faptele primului unificator al Ţărilor Române, Mihai Viteazul (1593-1601), petrecute, în 1595, la Stoeneşti, între Câmpulung şi Târgovişte, ulterior, 25 noiembrie 1600, lângă vechea reşedinţă de la Curtea de Argeş, unde a angajat ultima sa iniţiativă militară la sud de Carpaţi. Nu peste multă vreme, domnul Matei Basarab (1632-1654) a instalat, la reşedinţa din Câmpulung, o tiparniţă. Legături statornice au menţinut, cu oamenii acestor locuri, totodată, voievozii Vlad Călugărul (1481-1495), Constantin Şerban (1654-1658), Şerban Cantacuzino (1678-1688), Constantin Brâncoveanu (1688-1714), dar şi unii domni fanarioţi (1716-1821), ale căror *legiuiri* şi *coduri*, vor direcţiona administraţia noastră premodernă. În 1793, la Piteşti exista sediul unei cancelarii episcopale ortodoxe, transferate ulterior la Curtea de Argeş.[15]

5.3. Argeşul şi Muscelul în epoca modernă şi contemporană

Cartea Argeşului înscrie importante şi semnificative concepte sau momente din timpul evenimentelor naţionale de la 1821, 1848, 1859, 1877, 1918. Ca dovadă, Tudor Vladimirescu, iniţiatorul acţiunilor novatoare de la 1821, care servise, temporar, în administraţia Muscelului, a cuprins oraşul Piteşti, ca punct strategic nordic al eventualei rezistenţe, în planurile mişcării revoluţionare, elaborate cu acordul direct al unor patrioţi luminişti. Precipitarea evenimentelor nu a permis, însă, aplicarea celor preconizate, din contră, *oşteanul din Vladimiri* devenea captiv al aliaţilor săi, liderii Eteriei elene, în tabăra stabilită la Goleşti, plătind, la 27 mai 1821, cu viaţa, undeva lângă Târgovişte, îndrăzneala de a ridica doleanţele neamului de jos la valoarea cerinţelor cardinale europene. Tradiţional, până în secolul XVIII, judeţul Argeş a fost coordonat, teritorial, de la Curtea de Argeş, reşedinţă devenind, apoi, oraşul Piteşti.

În perioada 1831-1864, atât Argeşul şi Muşcelul au fost conduse de *ocârmuitori*, înlocuiţi, prin *Legea administraţiei*, de la 1 aprilie 1864[16], cu prefecţi (inspiraţie franceză). Apar, totodată, consiliile judeţene. Conform *Regulamentului Organic*, aplicat, efectiv, în perioada 1832-1858, judeţul Argeş avea *plaiurile* Aref şi Loviştea, precum şi şase *plase*: Argeş, Găleşeşti, Oltul de Jos, Piteşti, Topolog, Vâlsan. Structură asemănătoare întâlnim şi în judeţul Muscel: *plaiurile* Argeşel, Dâmboviţa,

Nucşoara; *plasele* Râuri şi Podgoria. De-a lungul timpului se vor produce numeroase modificări.

Un succes important al conducerii celor două judeţe a fost înfiinţarea şcolilor săteşti de stat, prin aplicarea *Poruncii Departamentului Treburilor din Lăuntru,* datată, Bucureşti, 14 ianuarie 1838. Activitatea era coordonată de Eforia Şcoalelor în colaborare cu Marea Logofeţie a Treburilor Bisericeşti. La începutul deceniului, se înfiinţaseră şcoli naţionale (normale) pentru reşedinţele de la Câmpulung (1832) şi Piteşti (1833), care au pregătit primii învăţători pentru instituţiile rurale. Aşa, de exemplu, la 2 aprilie 1839, în plasa Podgoria (Muscel) se considerau deschise 17 şcoli primare. Argeşenii şi muscelenii s-au implicat activ în *Revoluţia de la 1848*, remarcându-se mai multe personalităţi originare din acest areal, precum: Ion C. Brătianu, Dumitru C. Brătianu, Ştefan C. Golescu, Nicolae C. Golescu, Radu C. Golescu, Alexandru C. Golescu (Albu), Alexandru G. Golescu (Negru), Constantin D. Aricescu, Ion D. Negulici, Nicolae Kretzulescu, Carol Davila. De menţionat faptul că, în majoritatea lor, membrii Guvernului Provizoriu de la 1848 proveneau din asemenea locuri, iar la Rucăr s-a retras, pentru scurt timp, *forul executiv* amintit, într-un moment al dezorientării conducătorilor revoluţiei.

În vederea realizării unirii Principatelor Române, respectând cele prevăzute de *Articolul 5* din *Înaltul Împărătesc Firman*, elaborat de Cancelaria Otomană, referitor la alegerile pentru *Adunarea Ad-hoc* a Munteniei, argeşenii au optat, să-i reprezinte, prin voinţa exprimată, la 17 septembrie 1857, ca deputaţi, pentru Scarlat Turnavitu, Dumitru C. Brătianu, Ion C. Brătianu, Tudosie Murgescu, iar muscelenii i-au preferat pe Ştefan Golescu, Alexandru G. Golescu (Negru), Constantin D. Aricescu, Ion Tică. Printre cei care l-au întîmpinat pe domnul unirii, Alexandru Ioan Cuza, la Bucureşti (7 februarie 1859), s-au aflat, împreună cu alţi oficiali, piteştenii Nicolae Coculescu şi Eftimie Nicolau. Peste câteva luni, în iunie 1859, principele a vizitat reşedinţa Argeşului, iar doamna Elena Cuza va sosi aici la 3 octombrie 1863.

Pe durata *Războiului de Independenţă* (1877-1878), cei mai mulţi argeşeni şi musceleni mobilizaţi au făcut parte din Regimentul 4 Dorobanţi, Regimentul 2 Călăraşi, Batalionul 4 Vânători. Pentru început, *dorobanţii* au apărat linia Dunării, apoi, prin *Ordinul Cartierului General*, vor participa la luptele cu turcii de la Capitanova, Rahova şi Vidin, iar unităţile militare ale *călăraşilor* s-au aflat în grupul celor ce au cucerit Rahova, Haltagi, Desa, Tatar, Mahala, Smârdan, Inova. *Vânătorii*, având comandamentul la Calafat, vor prelua (25 noiembrie 1878), după finalizarea ostilităţilor şi obţinerea succesului scontat, controlul asupra oraşului Constanţa, contribuind, nemijlocit, la instituirea administraţiei române pe teritoriul Dobrogei în etapa dintre *tratatele de pace* de la San Stefano (19 februarie 1878) şi Berlin (1/13 iulie 1878). Înaintea festivităţilor din Bucureşti (8/20 octombrie 1878), Guvernul României, împreună cu viitorul rege Carol I, concentrează oştirea în triunghiul strategic Piteşti-Câmpulung-Târgovişte, ceea ce relevă importanţa acordată zonei Argeş-Muscel în finalul conflictului ruso-turc din 1877-1878.[17] De remarcat faptul că martirii independenţei, originari din judeţele invocate, sunt consemnaţi, după 1984, în originala operă comemorativă „*Argeş. Cartea eroilor*," *bibliofilie* unicat în România, fiind înscrişi, totodată, pe monumetele existente în toate localităţile din această parte a ţării, împreună cu cei căzuţi la datorie în 1913, 1916-1918, 1941-1945.[18]

Argeşul şi Muscelul s-au racordat eforturilor naţionale din etapa participării României la Primul Război Mondial (1916-1918), evenimentul favorizând Marea Unire de la 1918. Militarii din Piteşti se găseau, la 21 august 1916, în zona operaţiunilor transilvănene, care ne-au fost, însă, defavorabile. Spre sfârşitul lunii noiembrie 1916, au ajuns, prin Pasul Buzău, în Moldova, participând, între 22 iulie – 1 august 1917, la obţinerea victoriei contra *Centralilor* de la Mărăşti. De remarcat faptul că Regimentul 4 Argeş, staţionat, pentru o vreme, în Iaşi, a trecut Prutul, la 24 februarie 1918, asigurând ordinea pe timpul dezbaterii *Hotărârii Unirii Basarabiei cu Statul Român*, adoptată la 27 martie 1918, cantonând apoi la Huşi. S-a reîntors, în Piteşti, spre finalul anului 1918. Motive speciale determină Guvernul României să consolideze suportul militar din Basarabia, unită cu *Patria Mamă*, context în care Regimentul 4 Argeş a plecat din Bucureşti spre Chişinău (25 februarie 1920), fiind păstrat, dincolo de Prut, până la 15 septembrie 1922. Peste exact o lună, regele Ferdinand s-a încoronat la Alba Iulia, devenind primul monarh al României Mari. Traiectorii distincte şi glorioase au avut, de asemenea, unităţile militare din Câmpulung, regăsite, în 1916, pe *Frontul Dobrogean*, ori la Mateiaş, Valea Mare-Pravăţ, Dragoslavele.

Participarea ţării noastre, pentru perioada 1941-1945, în cel de Al Doilea Război Mondial (1939-1945), readuce această zonă în prim-planul evenimentelor etapei respective. S-a motivat, oficial, ofensiva spre est, începând cu 22 iunie 1941, alături de *Axă*, prin obligaţia istorică a reintegrării Basarabiei, Bucovinei de Nord şi a Ţinutului Herţa în teritoriul autohton. Reliefăm aspectul că, după notele ultimative ale Guvernului Uniunii Sovietice, din iunie 1940, mai multe familii de români, din provinciile amintite, se vor refugia în Argeş-Muscel, găsind aici adăpost şi locuri de muncă onorabile. Reorientarea politicii externe a României, în august 1944, a determinat participarea unor unităţi militare locale pe Frontul de Vest, până în Slovacia şi Austria, reeditânduse, comparabil, tragediile umane din etapa estică a războiului. Anii 1941-1945 au mărit contribuţia de sânge a cetăţenilor din Argeş-Muscel pe *Altarul sacrificiului suprem*, ridicat simbolic în spiritul păcii, democraţiei, libertăţii şi independenţei popoarelor.[19]

5.4. Argeşul şi Muscelul în perioada comunistă

După înfrângerea Germaniei fasciste, România intră în sfera de influenţă a Moscovei. Trupe sovietice rămân în baze apropiate oraşelor Piteşti, Câmpulung, Curtea de Argeş, până în 1958. Încă din debutul exprimării regimului comunist postbelic, în zona nordică a Muscelului şi Argeşului s-au organizat diverse grupări opozante, cele mai active fiind conduse de Gheorghe Arsenescu şi Toma Arnăuţoiu (ofiţeri), denumite *Haiducii Muscelului*, anihilate de Securitatea Statului în deceniul şase al secolului XX. Mulţi dintre luptători şi susţinători au fost capturaţi, judecaţi, condamnaţi la ani grei de închisoare sau executaţi. Totodată, în reşedinţa Argeşului a existat celebra temniţă a drasticei detenţii, unde s-au folosit ingenioase tehnici de reeducare a deţinuţilor prin tortură, ceea ce a generat sintagma *Experimentul Piteşti*, de tristă amintire pentru istoria acestor locuri. În aşezările sudice, opoziţia a vizat, prioritar, contracararea *colectivizării* agriculturii şi exproprierile executorii.

Sistemele promovate şi aplicate în perioada decembrie 1947 (abolirea monarhiei şi instaurarea Republicii Populare Române) – decembrie 1989, au conferit zonei Argeş-Muscel o anumită identitate contradictorie, în sensul anulării, pluripartidismului organizaţional local, prin impunerea exclusivismului piramidei dominante, fenomen suprapus, însă, redimensionării structurilor urbane, industrializării intensive, constituirii fermelor agricole, eradicării analfabetismului şi şomajului, menţinerii echilibrului religios, acordării anumitor facilităţi şcolare sau profesionale.

Ideile promovate în etapa interbelică, de liderii naţionali originari din această parte a României, liberalii Ion I.C. Brătianu (1864-1927), Vintilă I.C. Brătianu (1867-1930), ţărăniştii Armand Călinescu (1893-1939), Ion Mihalache (1882-1965), ori de alţi militanţi apropiaţi acestora, au fost total repudiate după 1947. Concomitent, parlamentarismul de stânga a propulsat, în arena vieţii, pe Constantin I. Parhon (1874-1969), născut la Câmpulung, Muscel, primul preşedinte al Prezidiului Marii Adunări Naţionale (1947-1952), dar şi pe Nicolae Ceauşescu (1818-1989), deputat de Piteşti în supremul for legislativ al ţării, vreme de 17 ani (1952-1969), primul preşedinte al statului (1974-1989).

Până în 1990, Argeşul a fost, timp îndelungat, a patra putere industrială etatistă a României contemporane, deţinând, decenii succesive, monopolul naţional al fabricării autoturismelor, primordialitatea Platformei Petrochimice Piteşti-Sud, prevalenţa anumitor ramuri prelucrătoare, ori din domeniile energiei electrice şi nucleare, silviculturii, pomiculturii, viticulturii, construcţiei de şcoli, spitale, apartamente, mari complexe comerciale. Ca urmare, începând cu 1966, semnificativ, zeci de delegaţii străine, de pe toate continentele, au vizitat municipiul Piteşti, considerat un arhetip al aplicării Doctrinei dezvoltorii socialiste multilaterale.[20]

5.5. România în contextul euroatlantic contemporan

După 1990, argeşenii şi muscelenii s-au readaptat, într-un timp relativ scurt, la principiile iniţiativei individuale, liberalizării preţurilor, concurenţei de piaţă, sistemului financiar actual, privatizării, conceptelor continentalizării. Comparativ cu alte judeţe, preocupările economice şi sociale au rămas aproape timp de 20 ani, în general, *plurivalente*. Ca dovadă, restructurarea întreprinderilor nu a generat o rată exagerată a disponibilizărilor, cuantumul investiţiilor străine s-a exprimat constant, iar ritmul constructiv a fost evident. Cu toate acestea, potenţialul industrial al Argeşului, comparativ cu nivelul anului 1989, a scăzut considerabil: închiderea unor mari capacităţi productive în zonele Piteşti-Nord, Piteşti-Sud, Câmpulung, Curtea de Argeş, inclusiv demolarea instalaţiilor sau a fabricilor; pierderea pieţelor externe; scăderea veniturilor salariale; exodul forţei calificate de muncă; falimentul diverselor firme mici şi mijlocii; reducerea cheltuielilor bugetare. Ca urmare, după 2010, sunt puţini agenţi economici care îşi asumă proiecte de anvergură, municipiul Piteşti având tendinţa să devină zonă a speculaţiilor bancare sau comerciale, dar mai puţin bază productivă. Este lăudabil faptul că aici se edifică, totuşi, unul dintre cele mai mari campusuri universitare de stat ale României, iar oraşul continuă să se transforme, în fiecare primăvară, începând încă din 1978, într-o capitală a lalelelor, turismul fiind promovat agresiv. Viaţa politică oferă diverse alternative, instituţiile

cultural-eclesiastice avansând proiecte diferenţiate. Gravitatea crizei mondiale din 2008-2010 s-a exprimat vizibil în Argeş-Muscel. Apartenenţa României la NATO (2004) şi la Uniunea Europeană (2007) favorizează optimismul depăşirii incertitudinilor inclusiv în această parte a ţării.

Din perspectiva regionalizării, Carta europeană privind autonomia locală, adoptată la Strasbourg la data de 15 octombrie 1985, face o distincţie între colectivităţile locale şi cele regionale. Definind autonomia locală ca „dreptul şi capacitatea efectivă ale autorităţilor administraţiei publice locale de a soluţiona şi de a gestiona, în cadrul legii, în nume propriu şi în interesul populaţiei locale, o parte importantă a treburilor publice, actul normativ conţine elemente de diferenţiere între structurile locale şi cele regionale. În acest sens, constatăm că cele din urmă reprezintă structuri mult mai vaste decât primele, dotate cu organe alese şi patrimoniu propriu.[21] România a semnat Carta la data de 4 octombrie 1994 şi a ratificat-o prin Legea nr. 199 din 17 noiembrie 1997 pentru ratificarea Cartei europene a autonomiei locale, adoptată la Strasbourg la 15 octombrie 1985, publicată în Monotorul Oficial nr. 331 din 26 noiembrie 1997. Actul normativ se limitează la a declara că prin noţiunea autoritate regională, prevăzută la art. 4 paragrafele 4 şi 5 din Carta europeană, se înţelege autoritate judeţeană a administraţiei publice locale. Aşadar, nu este reglementat în niciun fel care este rolul judeţelor sau care este raportul dintre acestea şi structurile autonomiei locale. Pentru o mai bună înţelegere a acestor aspecte ar fi necesar ca sistemul legislativ românesc să definească cele două concepte utilizate în ratificarea Cartei europene privind autonomia locală, respectiv cel de autoritate regională şi autoritate judeţeană, făcând o corelare mai clară între cele două concepte şi o definire a trăsăturilor acestora.[13] Cu alte cuvinte, este timpul când ne lovim de întrebarea fundamentală: De ce sunt împotriva regionalizării? Şi pentru că această întrebare nu este una academică, fiind doar rodul reflecţiei lui *Alexis de Tocqueville: „O putere centrală, oricât de luminată şi savantă ar fi, nu poate să cuprindă toate detaliile vieţii unui popor”* curinsă *în lucrarea sa „Despre democraţie în America”.* Mai de grabă cred că este visul unei societăţi perfect sincronizate, asemănătoare cu un mecanism de ceasornic, care i-a chinuit pe mulţi dintre „modernizatorii” care au influenţat epoca industrială. Lipsa de spatiu ne impiedică să oferim o explicatie a sensului acestui paralelism. Este limpede, totuşi, că din această perspectivă decidenţii încearcă să ni-l se descopere precum ceva hotărâtor prin importanţa sa. Pentru noi românii, regionalizarea nu este o simpla obligatie asumată prin tratate, nu este nici o cutumă; ea este legata de taina intimă a vieţii noastre. Şi dacă mai avem în vedere că *regionalizarea este adesea confundată cu regionalismul lucrurile se complică, ajungându-se într-un adevărat r***egionalism v.s. regionalizare.**

6. România prinsă în capcana *r*egionalism v.s. regionalizare

6.1. Chestiuni precizatoare

Regionalismul reprezintă conştientizarea intereselor comune şi în acelaşi timp aspiraţia de a participa la gestiunea acestor interese. Cu alte cuvinte o comunitate care se consideră capabilă să rezolve problemele locale în detrimentul statului,

considerat prea îndepărtat şi prea mare. Regionalismul poate fi privit ca un termen cu dublu sens: „o mişcare de sus în jos (regionalizarea), iar mişcarea de jos în sus (regionalismul).” Ambele sunt concepte ce descriu mişcări în plan regional, interacţionând reciproc. Cu toate acestea există o diferenţă: „regionalismul ca termen întâlnit în discursul politicienilor, care poate duce la federalizare (un ansamblul teritorial cu o istorie şi cultură comună ce poate dobândi competenţe pentru politicile publice)” şi regionalizarea care este „o acţiune administrativă ce vizează crearea unor spaţii de cooperare şi defineşte noi unităţi administrativ-teritoriale.”

Regionalizarea are ca punct de plecare dezechilibrele regionale sau conştientizarea acestora: statul poate astfel recunoaşte o identitate regională (regiunea fiind de data aceasta ca un teritoriu considerat omogen de către stat) şi poate lua măsurile necesare pentru ca regiunile să participe la gestionarea afacerilor proprii. Prin urmare, regionalizare înseamnă dorinţa de a ajunge la un echilibru al dezvoltării economice, prin ridicarea nivelului zonelor mai slab dezvoltate, iar pentru aceasta, regionalismul militează pentru ajungerea regiunii la puterea de decizie. Fie că e vorba despre regionalism, fie despre regionalizare, descentralizarea este principalul beneficiu al celor doi termeni. Descentralizarea care aduce cu ea şi procesul de guvernare multi-nivel.

6.2. Despre guvernarea multi-nivel

Potrivit Organizaţiei pentru Cooperare Economică şi Dezvoltare care încurajează guvernarea multi-nivel, „descentralizarea a făcut ca guvernele locale şi regionale să fie mai puternice şi se presupune că a crescut capacitatea lor de a formula şi aplica politici. Guvernele locale şi regionale, îngrijorate că economiile lor sunt din ce în ce mai expuse concurenţei mondiale, se aşteaptă acum să influenţeze politicile publice, astfel încât acestea să aibă un impact real şi pozitiv asupra îmbunătăţirii competitivităţii economiei regionale şi a bunăstării locuitorilor.”

În ceea ce priveşte viziunea Uniunii Europene, asupra guvernării multi-nivel aceasta este redată de Comitetul Regiunilor – un organism consultativ care reprezintă autorităţile locale şi regionale din UE. Rolul acestuia este de a face cunoscute punctele de vedere locale şi regionale cu privire la legislaţia UE, lansând rapoarte sau „avize” pe marginea propunerilor Comisiei Europene: „Uniunea trebuie să lucreze în parteneriate prin promovarea unei culturi a guvernanţei pe mai multe niveluri.” Mai trebuie avut în vedere şi Consiliul Municipalităţilor şi Regiunilor Europene, fondat la Geneva în 1951 care este cea mai mare organizaţie a autorităţilor locale şi regionale din Europa, membrii săi fiind peste 50 de asociaţii naţionale de oraşe, municipii şi regiuni din 40 de ţări. Împreună, aceste asociaţii reprezintă aproximativ 150.000 de autorităţi locale şi regionale. Adunarea Regiunilor Europene, fondată în 1985 este cea mai mare reţea independentă de autorităţi regionale din întreaga Europă, reunind peste 250 de regiuni din 35 de ţări, împreună cu 16 organizaţii interregionale. Ei sunt lobbiştii intereselor locale şi regionale la Bruxelles. Împreună, în decembrie 2011 au semnat documentul „Guvernanţă în parteneriat – Uniţi pentru a construi o Europă mai puternică”,

document care a subliniat, la momentul respectiv, rolul guvernanţei multi-nivel în concordanţă cu obiectivele strategiei Europa 2020. Numai că, între timp, Marea Britanie, cu toate obstacolele ivite, a ales al drum!

Pentru noi, articolul 120 din Constituţie stipulează următoarele în legătură cu descentralizarea României: „Administraţia publică din unităţile administrativ-teritoriale se întemeiază pe principiile descentralizării, autonomiei locale şi deconcentrării serviciilor publice." Acesta este principiul de bază al descentralizării în România, însă în practică acesta lipseşte cu desăvârşire rămânând un principiu doar pe hârtie. Descentralizarea poate fi o garanţie a stabilităţii unei democraţii funcţionale. România este membră a UE, iar în Europa principiul subsidiarităţii este un termen de bază. Europa este una a colectivităţilor locale descentralizate, care permit o colaborare şi dezvoltare mai rapidă a regiunilor şi a comunităţilor locale. Nu ştiu dacă modelul Poloniei este cel mai potrivit, dar succesul lor în realizarea descentralizării nu ar fi fost posibil fără sprijinul masiv al Germaniei şi SUA. Ştim că Polonia are o altă cultură şi mentalitate ca popor, a trecut repede la privatizare în anii 90 ducând o politică a liberalizării, Polonia a avut Solidarnosk. Ceea ce nu s-a întâmplat în România. Pe de altă parte, ei sunt singura ţară cu care ne putem compara în multe privinţe: poziţie geografică, mărime, populaţie etc.

6.3. Despre regionalizarea României, între ciocanul de la Budapesta şi nicovala de la Burxelles

În principiu, România are nevoie de un proces de descentralizare pentru a eficientiza nevoile de dezvoltare ale regiunilor şi pentru a le acorda acestora şansa de a se dezvolta în ritmul propriu. Acest proces va trebui implementat însă cu foarte mare atenţie, deoarece există riscul ca acest proces să conducă la o înteţire a procedurilor birocratice şi totodată să se accentueze fenomenul corupţiei la nivel local. Este de datoria experţilor să propună diferite formule, care să aibă în vedere aceste riscuri, şi care vor fi decise la nivel politic: o reorganizare cu sau fără judeţe, ce bugete, cu sau fără alegeri directe, durata mandatelor, prerogativele funcţionale care vor fi deţinute de aceste regiuni etc. Or pentru aceasta este necesară o voinţă politică şi o dezbatere care să genereze un consens la nivel naţional şi la care să ia parte toţi actorii politici, locali şi sociali. De la Bruxelles regionalizarea se vede altfel decât de la Budapesta, iar Bucureştiul trebuie să decidă care va fi calea de urmat. Până atunci ar fi nevoie de un demers de înţelegere şi analiză al avantajelor/dezavantajelor şi beneficiilor/riscurilor ce pot apărea în cadrul regionalizării: un proces complex de cercetare şi dezbatere pe tema regionalizării, în reţea, pe multiple paliere, având la dispoziţie o perioadă suficientă, dar totuşi limitată, pentru a da ocazia de a fi luate în timp util eventualele decizii la nivel naţional. Regionalizarea trebuie să fie consecinţa dorinţei interne a românilor, implementată de către decidenţi printr-un proces democratic participativ autentic. Până atunci, încercarea noastră de abordare a necesităţii cercetării interdisciplinare a regionalizării la care suntem tentaţi să purcedem, dat fiind faptul că toţi suntem interesaţi să fim cât mai bine administraţi, se loveşte de neputinţa decidenţilor politici. Pentru a le veni în ajutor le oferim câteva repere ale posibilei regionalizări a României.

6.4. Repere teoretice ale procesului de regionalizare a României

Chiar dacă nu suntem de acord cu regionalizarea patriei noastre, acest fapt nu poate impidica debutul realizării ei. Dacă se va produce, îndrăznim să avem şi noi opinia noastră întrucât regiunea a trecut prin mai multe faze de evoluţie, inclusiv prin cea de regiune-sistem şi de regiune de dezvoltare şi a ajuns să fie considerată ca noţiunea operaţională cea mai adaptată unei perioade în care statul pierde din importanţă, prin globalizare. Aceasta a condus la aserţiunea că lumea de astăzi nu mai este o lume a statelor ci a regiunilor, de unde şi ideea de fragmentare a Europei în regiuni şi considerarea acestora ca bază a cooperării continentale. În acelaşi timp, noua geografie economică, dezvoltată după anul 1990 şi confirmată de raportul Băncii Mondiale în 2009, arată că eficienţa economică depinde de aglomeraţii, de regiunile foarte dezvoltate care concentrează producţia. În acest context, regiunile bogate le-ar putea ajuta pe cele sărace să se dezvolte? M. Storper (2011) pune această întrebare referindu-se la faptul că alături de eficienţa economică trebuie adăugată şi justiţia socială şi că unele „locuri" trebuie să le ajute pe altele.

Relaţia dintre coeziune teritorială şi dezvoltare regională este una complexă, în ciuda unei aparente simplităţi: nu este vorba în totalitate de o relaţie de subordonare, ci mai degrabă de o relaţie cu caracter reciproc, în care conceptul de regiune este fundamental. Spre deosebire de conceptul de dezvoltare regională, conturat de-a lungul a mai multe decenii, conceptul de coeziune teritorială este unul relativ nou, iniţial având doar conotaţie social-economică. Ulterior acest concept s-a extins la nivel teritorial, ca urmare a faptului că nu se poate vorbi doar de relaţii armonioase între ramurile economice şi categoriile sociale, ci şi între acestea, comunităţile umane şi spaţiul în care trăiesc. Or, într-un astfel de context, pentru a realiza un demers congruent cu ceea ce se aşteaptă în plan academic pentru descifrarea mecanismelor care guvernează dezvoltarea teritorială, nu se poate face abstracţie de conceptul de regiune. Acesta oferă un cadru care, beneficiind de avantajele descentralizării, poate susţine o mai puternică dezvoltare endogenă. În general, se acceptă că regiunea este un spaţiu vast, cu multe subspaţii plasate pe diferite nivele de dezvoltare.[22]

Politica de coeziune europeană şi fondurile structurale, ca principal instrument, contribuie la schimbări teritoriale importante prin politicile regionale. Regiunea rămâne, în acest context, un concept de bază, la nivelul căruia poate fi promovată atât competiţia, cât şi cooperarea la scară europeană. Dezvoltarea teritorială europeană a traversat o perioadă de tranziţie între două perioade de planificare financiară: 2007-2013 şi 2014-2020. Această perioadă a fost una de analiză critică a acţiunilor deja realizate şi o perioadă de anticipare a unor schimbări ce ar putea oferi soluţii adecvate în vederea ieşirii din criză şi a implementării de acţiuni mult mai bine centrate pe rezultate. Numeroase documente, politici şi implicit instrumente au fost concepute drept suport pentru a anticipa perioada cuprinsă între 2020-2030, cele mai importante fiind Strategia Europa 2030, Politica de Coeziune, Contractul de Parteneriat. Pentru realizarea unei Europe unite, în care coeziunea teritorială să fie dominanta principală, dezvoltarea regională reprezintă un obiectiv important. Întreaga experienţă acumulată de ţările din UE în acest

domeniu a demonstrat că o mai bună distribuţie teritorială a resurselor, alături de o valorificare superioară a complexului de elemente potenţiale, existente la nivel local sau supralocal, devin factori de creştere economică şi de echitate socială. Multă vreme s-a discutat despre dezvoltarea armonioasă a tuturor regiunilor unui stat, luând în consideraţie dezvoltarea echilibrată a acestora. O astfel de dezvoltare presupunea, în principal, atingerea unor parametri legaţi de dezvoltarea industriei şi de utilizarea integrală a potenţialului uman din aceste regiuni. Coeziunea teritorială este, însă, un concept mult mai cuprinzător decât dezvoltarea echilibrată sau armonioasă, incluzând elemente care ţin de coerenţă şi sinergie teritorială.[23]

Concluzia este că regiunea a fost şi rămâne un cadru nu numai pentru dezbaterile teoretice, dar reprezintă un cadru administrativ, adoptat de foarte multe ţări la nivel european pentru a măsura disparităţile teritoriale şi pentru a organiza mai bine teritoriul de la nivel sub-naţional. Rezultatele obţinute, utilizând regiunea ca instrument în realizarea coeziunii teritoriale, demonstrează capacitatea acesteia de a asigura o reală dezvoltare a statului respectiv. Or, în ceea ce priveşte necesitatea unei regionalizări administrative în România, avem unele rezerve legare de situaţia concretă, cu un nivel general de dezvoltare mult sub media europeană şi chiar a ţărilor din Centrul Europei, cu decalaje regionale ce riscă să se adâncească şi care implică adoptarea unor politici flexibile de dezvoltare teritorială, ce vor determina atenuarea treptată a acestor decalaje. Pe de altă parte, trebuie luate în consideraţie resursele financiare scăzute de care dispune ţara pentru a induce o creştere economică accelerată în regiunile rămase în urmă şi pentru apropierea de regiunile şi ţările europene dezvoltate. În astfel de condiţii, a apărut necesitatea redefinirii politicii de dezvoltare regională şi a proiecţiei sale teritoriale, care să ţină cont, pe de o parte, de particularităţile spaţiului românesc şi de progresele înregistrate de implementarea unei politici de dezvoltare timp de cel puţin două decenii, iar, pe de altă parte, de realizarea obiectivelor apărute în noile documente ale Uniunii Europene pe linia creşterii coeziunii la nivel continental. Din această perspectivă, opinăm că reconsiderarea conceptului de regiune administrativă în România, dar mai ales implementarea acestuia, în sens european, ar avea la bază trei constatări fundamentale:

a) Rezultatele foarte bune obţinute de unele dintre ţările fostului regim comunist, care, adoptând un cadru administrativ regional, au reuşit să beneficieze de toate oportunităţile oferite de UE. Într-un astfel de cadru, procesul de descentralizare şi-a regăsit capacitatea de a face faţă provocărilor determinate de globalizare. În acest caz, exemplul Poloniei este deja notoriu. O descentralizare eficientă la nivelul actualelor judeţe nu este posibilă, datorită dimensiunii reduse a acestora. Preluarea a numeroase funcţii de la centru şi localizarea acestora în 42 de entităţi teritoriale, ar reduce potenţialul de cooperare şi de realizare a unor proiecte regionale iar costurile unei astfel de descentralizări ar fi enorme, având în vedere hipertrofierea serviciilor publice la nivelul fiecărei reşedinţe de judeţ.

b) Actualele regiuni de dezvoltare au avut un rol, experimentul apaţinând trecutului. Înfiinţarea acestora în anul 1998, nu a adus niciun plus de coerenţă în gestiunea proceselor de dezvoltare teritorială. Pentru a trece la o nouă calitate, regiunile de dezvoltare trebuie să fie transformate în regiuni administrative, cu

organe elective proprii, asumându-şi responsabilitatea în procesul de dezvoltare regională. De altfel, la Conferinţa de lansare a Cartei Verzi pentru definirea politicii de dezvoltare regională în România (mai 1997), s-a afirmat public că durata de viaţă a regiunilor de dezvoltare nu trebuie să depăşească 10 ani. Acestea au reprezentat un cadru provizoriu în realizarea politicilor de preaderare la UE, provizorat care se menţine şi la apariţia acestor rânduri.

c) Regiunile de dezvoltare nu pot fi considerate o formă de gestionare teritorială, capabilă să susţină o guvernare de tip multi-level. În acest sens, dinamica vieţii social-economice a demonstrat că regiunile de dezvoltare, alcătuite pe baze asociative au caracterul unor elemente cadru cu rol redus în dezvoltarea teritorială propriu-zisă, atâta vreme cât deciziile se iau într-o viziune în care judeţul este elementul cheie şi singurul ordonator de credite. Modul de distribuire a fondurilor în actualele regiuni de dezvoltare nu ţine cont de proiectele cu caracter interjudeţean, ci numai local, mai rar trans-judeţean.

Plecând de la aceste constatări se pot defini, sintetic, câteva elemente care demonstrează, pe de o parte că aşa nu se mai poate (având doar regiuni statistice, fără atribute de ordin administrativ), iar pe de altă parte, că România trebuie să-şi optimizeze structurile teritoriale în care se derulează procesul de dezvoltare. Fără a impune o anumită ordine în raport cu importanţa argumentelor pentru necesitatea creării cadrului administrativ regional, remarcăm următoarele:

a. După două decenii de funcţionare a regiunilor de dezvoltare s-a putut observa foarte uşor că eficacitatea acestora a fost mult redusă, că definirea şi implementarea unor politici proprii de dezvoltare regională sunt foarte greoaie. Această situaţie rezultă din:
   - lipsa proiectelor cu caracter interjudeţean coroborată cu insuficienţa resurselor pentru cofinanţarea marilor proiecte au generat incapacitatea gestionării decalajelor intraregionale şi a dezvoltării cooperării interregionale;
   - slabă cooperare directă cu regiunile dezvoltate ale UE, fără a apela la structurile centrale determinată de fărâmiţarea fondurilor prin proiecte repartizate judeţelor.
b. Criza morală, economico-financiară şi socială actuală tinde să accentueze decalajele - necesitatea optimizării fluxurilor decizionale şi organizaţionale în teritoriu; în sistemul actual judeţele slab dezvoltate au şanse tot mai reduse de a recupera decalajele de dezvoltare, fapt demonstrat de evoluţia principalilor indicatori socio-economici;
c. Rata redusă de absorbţie a fondurilor UE – incapacitatea judeţelor de a susţine proiecte de anvergură cu impact regional, precum şi modul de alocare a fondurilor europene în sistem competitiv a menţinut şi încurajat identitatea judeţeană, în lipsa unei structuri administrative superioare – care să vizeze şi cooperarea interjudeţeană.
d. Lipsa unei coerenţe cu efecte reale la nivelul judeţelor şi al localităţilor ceea ce reduce şansele unei corelări orizontale (între judeţe) şi verticale (naţional – judeţean);

Contextul de dezvoltare a României a beneficiat de o viziune definită la nivel continental prin documente europene strategice: Strategia UE 2020 şi Agenda Teritorială 2020. Implementarea acestora a implicat, existenţa unor regiuni administrative, ca bază a unei descentralizări teritoriale autentice la nivel naţional. Viitorul pare puţin optimist din această perspectivă mai ales că s-a complicat procesul de dezvoltare teritorială prin intervenţia unei palete largi de actori, mai ales la nivel local, supralocal şi regional, ceea ce face imposibilă capacitatea „Centrului" de a gestiona procesele teritoriale. Aşa că, apare, din nou fireasca întrebare: este conectată societatea românească la momentul trecerii la regiunile administrative? Pentru o bună parte din populaţie şi actori ai vieţii economico-sociale şi politice, momentul actual, de criză, este considerat ca fiind neadecvat, întrucât dezvoltarea teritorială poate beneficia de statutul actual al regiunilor, cu agenţiile lor de dezvoltare, care se consideră capabile a gestiona fondurile accesate de la UE.[24]

Evident că nu Uniunea Europeană ne obligă să îmbunătăţim cadrul teritorial de guvernare, dimpotrivă, am putea spune că unele state ar fi interesate să nu accesăm decât o parte redusă din fonduri. Prin noul instrument de stimulare, statele care reuşesc să atragă banii alocaţi, pot primi prin redistribuire sumele care nu au fost atrase de alte state. Prin urmare, este foarte important ca fiecare stat să-şi perfecţioneze instrumentele şi capacitatea internă de a absorbi toţi banii care îi revin şi, dacă este posibil, chiar să beneficieze de situaţii ca cea descrisă mai sus. Să nu uităm nici faptul că al doilea mare contributor financiar, a spus adio Bruxellului, iar nu europenilor. Luând în consideraţie cele de mai sus şi faptul că fondurile naţionale de dezvoltare cheltuite nu au avut efectul de amplificare a beneficiilor, ci dimpotrivă au avut doar efecte foarte limitate, considerăm că acesta este momentul cel mai bun de a realiza o construcţie regională administrativă viabilă şi cu o utilitate imediată. Pentru aceasta, trebuie avute în vedere următoarele:

- Facilitarea accesului la fondurile alocate de UE în exerciţiul financiar 2021-2027 şi creşterea capacităţii de absorbţie a acestora la nivel regional. Nerealizarea acestui cadru acum ar amâna constituirea regiunilor pentru exerciţiul financiar următor al UE sine die;
- Reconstrucţia instituţională teritorială, pentru ca regiunile să poată deţine capacitate decizională şi competenţe similare regiunilor din majoritatea statelor europene prin intensificarea cooperărilor interregionale la scară europeană, România fiin singurul stat membru, de dimensiuni superioare mediei din UE, care nu are regiuni administrative.

În afara celor menţionate mai sus, momentul actual este extrem de favorabil, pentru că se cuplează cu două condiţii necesare şi mai rar întâlnite în evoluţia politică a unei societăţi:

- Organizarea Referendumului pentru Constituţie – posibilitate unică de statuare a regiunilor ca entităţi teritoriale administrative;
- Începutul unei guvernări reprezintă o altă oportunitate de a pune în concordanţă structura administrativ-teritorială a României cu noile perspective de dezvoltare în UE.

Concluzia este că orice întârziere ar aduce prejudicii. Costurile implementării unei astfel de structuri pot fi estimate ca fiind reduse, pentru că descentralizarea nu se poate face imediat după stabilirea cadrului administrativ, ci aceasta se consolidează pe măsura construirii instituţiilor specifice diferitelor niveluri de guvernanţă.

În fine, procesul de definire şi delimitare teritorială a regiunilor administrative ar trebui să fie bazate pe principii, criterii şi indicatori bine definiţi care să demareze de la ideea fundamentală că acestea nu reprezintă rezultatul actual al distribuţiei spaţiale a „dezvoltării", că nu înseamnă revitalizarea unor forme de administrare teritorială care erau eficiente în anumite perioade istorice, ci că reprezintă un cadru pentru proiecţia spaţială viitoare a dezvoltării. Cu alte cuvinte, construcţia noilor regiuni administrative urmăreşte atingerea unor ţinte de dezvoltare fixate pe termen lung. Apoi, este fondată pe idea că o regiune administrativă trebuie construită pe o bază multicriterială. Toate regionalizările care s-au bazat pe analize monocriteriale nu au rezistat, tocmai de aceea regiunile durabile, cu efecte benefice asupra spaţiului, sunt cele care se fundamentează pe mai multe criterii acoperind o mare parte din diversitatea componentelor regionale. O altă chestiune importantă, de fond, este aceea care se bazează pe faptul că judeţele s-au dovedit eficiente de-a lungul istoriei şi că acestea, în construcţia regională, trebuie adoptate ca atare. Prin urmare, viitoarele regiuni administrative vor fi grupări de judeţe, pe un fond multicriterial.

În afara acestor principii generale, putem individualiza şi idei directoare:

- funcţionalitatea, însemnând asigurarea unei libertăţi de circulaţie a fluxurilor materiale şi de informaţii, care să asigure dezvoltarea tuturor judeţelor componente;
- complementaritatea este esenţa funcţionalităţii prin varietatea resurselor şi a funcţiilor pe care le deţin localităţile şi subsistemele teritoriale;
- solidaritatea, rezultând dintr-un spirit de echitate socială între locuri şi subregiuni; un astfel de principiu se construieşte în timp, pe măsura ce ariile bogate şi cele sărace dintr-o regiune conştientizează faptul că trebuie să coopereze pentru a se dezvolta împreună şi a evita apariţia de fenomene generatoare de conflicte;
- diversitatea rezultă din varietatea potenţialului natural, economic, social şi cultural al regiunii viitoare, toate acestea contribuind la morfogeneza unor relaţii teritoriale de dependenţă, care vor converge spre funcţionalitate şi solidaritate;
- competitivitatea constituie un deziderat regional, care poate fi atins în condiţiile individualizării clare a atuurilor şi a excelenţei teritoriale; qcest principiu va trebui să utilizeze la maximum potenţialul de inteligenţă şi de cooperare în cadrul regional creat;
- eficacitate administrativă preconizată se bazează pe o accesibilitate relativ egală pentru toţi locuitorii unei regiuni, pe un sistem de competenţe care să se bazeze pe responsabilitate nedivizată.

- continuitatea, respectiv necesitatea asigurării unei continuităţi teritoriale, care să asigure optima funcţionalitate şi conectivitate a tuturor componentelor regiunii. Este de asemenea de evitat crearea unor regiuni care să conţină enclave care pot fragmenta teritoriul regional şi fluxurile interioare.[25]

Ar mai fi multe de discutat, dar lăsăm diveşilor specialişti cercetarea pe mai departe a procesului regionalizării din România. Însă nu trebuie să uităm că orice lucru făcut de mâna omului este srticăcios, numai Dumnezeu este veşnic, etern! Aşa că îndrăznim să încheiem demersul nostru de cercetare ştiinţifică prin câteva formulări concluzive.

7. Concluzii

Faţă de cele ce preced, putem concluziona că legislaţia română este lacunară în ceea ce priveşte reglementarea conceptului de regiune. Mai mult decât atât, deşi această noţiune a fost reglementată legislativ la un moment dat în istoria statului român, atât înţelesul său, cât şi caracteristicile sale definitorii, erau cu totul diferite de modalitatea în care este reglementată astăzi noţiunea de regiune la nivel european. Astfel, nu numai că regiunea este actualmente înţeleasă ca fiind o unitate administrativ teritorială de sine stătătoare, cu personalitate juridică, organe de conducere proprii şi patrimoniu propriu, dar şi trăsăturile principale ale acesteia sunt reprezentate de un puternic grad de descentralizare şi autonomie locală. Aşadar, regionalizarea făcută în România în anul 1950, în plină epocă stalinistă, este în antiteză cu ceea ce înseamnă astăzi un proces de regionalizare, întrucât la acea vreme se urmărea exercitarea unui control cât mai mare al puterii centrale asupra administraţiei locale. Pe cale de consecinţă, reglementarea juridică a noţiunii de regiune de la acea vreme nu poate servi sub nicio formă drept etalon pentru o consacrare legislativă actuală. Numai dacă nu cumva considerăm că URSS de atunci este UE de azi! Sau invers! Nimic nu este nou sub soare, spune Eclesiastul!

Având în vedere faptul că o eventuală reorganizare administrativ-teritorială trebuie să asigure un sistem funcţional, care să poată fi implementat cu minimalizarea posibilelor efecte negative pe diverse planuri, pentru a nu crea dezechilibre mai mari decât cele existente în prezent, va fi o adevărată provocare pentru legiuitorul român crearea unui cadru legislativ adecvat. Mai degrabă susţinem elementele Domnului profesor Cătălin Vrabie despre e-guvernare - concept cunoscut şi în spatele englezismului e-gov - ca fiind una dintre cele mai interesante provocări a adminitratiei publice din întreaga lume.[26] De aceea, am dorit ca paginile aflate sub ochii cititorului avizat să fie realiste şi echilibrate, disociate, pe cât posibil, de conotaţii politice, subiectivism, influenţe colaterale. Susţinem, principial, concepţia analistului american Charles Beard, care concluzionează: „*Istoricul trebuie să fie, în primul rând, un fiu al vremii sale".* Sperăm să ne integrăm, cu succes, sensurile apriori nepărtinitoare, formulate prin diversitatea relatărilor, multe având un anumit grad de noutate şi originalitate. În acest sens, pe lângă bibliografia lecturată sau fondurile arhivistice consultate, un rol aparte l-au avut discuţiile purtate nemijlocit cu specialiştii pe domenii de activitate. Ultimul aspect

presupune atât asumarea morală a autenticităţii celor relatate, cât şi oferirea anumitor detalii esenţiale, necesare viitorilor cercetători, scutiţi de eforturile depuse prin strădaniile noastre. Conservând, aşadar, inclusiv prin asemenea modalitate, esenţa evoluţiei zonei Argeş-Muscel din ultima jumătate de secol, vom menţine, cu certitudine, durabilitatea seculară perpetuă a tot ceea ce ne înconjoară. Mai mult, îndrăznim să spunem, pentru România, partia noastră binecuvântată de Dumnezeu, atât de des şi mult încercată în tumultoasa şi milenara sa istorie.

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Overcoming challenges of managing urban parking space in developing cities: Lessons of engaging public private partnerships (PPP) in Kampala Capital City Authority

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Abstract

This paper presents findings from a study carried out to examine involvement of private partners in managing urban street parking in Kampala City Council Authority. The objectives that guided the study were: to examine how public private partnerships expertise contributed to improvement in urban street parking in Kampala Capital City Authority. Specifically, the study aimed at examining how public private partnerships stakeholders' involvement and parking regulations compliance contributed to urban parking management regulations in Kampala City. The study adopted a descriptive and analytical design, which involved reviewing available literature and the collection of primary data from contracted firms and KCCA staff, using both qualitative and quantitative approaches. Findings revealed positive contribution of the expertise of the private partners in urban parking management as manifested in regulation compliance and involvement of stakeholders especially drivers in designing changes in street parking regulations and in identifying priority parking spaces. The study recommends that while contacting out management of street parking to private actors, assessments of their technical expertise and financial capacity should be put in fore considerations.

Keywords: *Urban street parking management, public private partnerships, Kampala Capital City Authority.*

1. Introduction and background

Rapid urban growth in Sub-Saharan Africa has come with several challenges including the proliferation of vehicles and urban congestion. In many urban areas parking has continued to pose serious challenges to urban mobility and municipal authorities are improvising means to free up space on their streets for urban activities. Governments have used a mix of public and private endeavors throughout history as attributed by [1] to address challenges of urban parking management and serving wider goals in transport policy and urban infrastructure planning.

However, critical analysis of current urbanisation in most Sub-Saharan Africa have key connotations to sustainable urban transport. For example, there is persistent road frustrations among road users mainly attributed to traffic jams that costs these economies more through lost man hours on roads which results in revenue loss. All this is associated with uncontrolled urban parking management. This analysis led to the key intent that guided this study to answer the objectives: How Public Private Partnership's (PPPs) expertise contributes to improvement in urban parking management in Kampala Capital City Authority (KCCA); How PPP's regulation compliance contributes to urban parking management in KCCA; and how PPP's stakeholders' involvement contributes to urban parking management in KCCA.

In the last 50 years urban parking has emerged as a thoughtful problem globally including in Western Europe, Japan, Hong Kong, Korea, Malaysia, and Thailand. However, through vigorous management and with efforts to avoid underpricing and oversupply, many cities have transformed their parking situations from a costly urban problem into an economic opportunity and valuable asset for urban communities [2].

In today's urban environment, much of the world's urban fabric is subject to "conventional" parking policy in which parking is treated as a type of infrastructure and the primary goal of every parking policy is to meet parking demand with supply. Setting minimum parking standards is the key tool commonly used to solve this challenge. In many cities, urban parking policy requires every building to have enough parking to meet its predicted peak demand. These parking regulations are aimed at eliminating possible risks of spillover of parking from the premises. However, quite often, parking demand mostly exceeds supply of parking space which results in parking dilemmas.

Whereas most countries in the suburban North America and Australasia apply the auto-centric conventional approach where, parking requirements are estimated based on auto-centric assumptions about parking demand, this approach has long come under attack by [3] and [4]. Nonetheless, it remains universal in its suburban heartlands with long term results of car dependency transport systems and shifting parking costs from users to everyone in society [5]. More critics of this model urge that it has also not solved the on-street parking problems in older, dense centers of activity and its inflexible application of parking requirements blocks regeneration of some inner-city areas.

Consequently, globally many urban centers as well as public establishments have resorted to PPPs to develop multi-level car parks or take over and manage existing car parking facilities and operating them under some predetermined

arrangements. For example, in Australia, a PPP agreement was signed between the Australian Hospital and a private company to *Build, Own, Operate and Transfer* (BOOT) a car park at a public hospital in Australia. In Bhutan, another PPP agreement was signed between Thimphu City and a private sector organisation to develop and manage an integrated parking system that included two new multi-level car parks of almost 550 parking spaces together with upgrading and management of close to 1,000 off-street and on-street surface parking on the basis of *Design, Build, Finance, Operate and Transfer* (DBFOT) arrangement. In Chile, the city of Santiago entered into a PPP arrangement where a private organisation was awarded an 8 years' concession to *Provide, Maintain, Operate and Use* (PMOU) parking meter system on public roads with provisions of penalties to the contractor for non-performance sub-standard service.

In Africa, experiencing the most recent urban tradition and experience of city life, is currently urbanizing at more than 4% annually. For example, whereas in 1995 only 28 cities on the continent had populations exceeding 1 million, by 2005 it had grown to 43 cities, and by 2015 to 59 African cities and 72 cities by 2023 and the urban population has risen to 569 million (45%) in 2020.

Accordingly, very few Sub-Saharan African cities have well-developed single authorities to deal with urban mobility and transport [6]. Where such authorities exist, they have not yet attained the maturity, fiscal powers and legitimacy to assume effective control over all modes of transport modalities like parking management in the urban environment. Only in cities such as Casablanca, Abidjan, Lagos and Dakar have (but few) multimodal transport authorities that have made significant impacts due to the complex and institutionally fragmented environment in which they function.

Further, as a result of weak urban governance, while sustainable urban mobility policies tend to strongly promote public transport, the reality is that most African cities have developed around individual transport and public authorities often struggle to control the supply side of public transport, (traffic and parking management). Consequently, urban congestion seems out of control in most cities with no scheduled bus services and are superseded by para-transit services [16]. In all, urban transport in Sub-Saharan Africa generically suffers from a clear lack of staff with adequate and specific competences in the various fields of urban transport (economics, public transport engineering, traffic management, sociology, parking management etc.) and technical schools or universities involved in research and teaching activities in the fields of urban transport are extremely rare on the continent.

In the East African region, member states have gone into PPP arrangements for management of street parking. In Tanzania, for example, a parking garage was built in the center of the city of Dar-es-Salaam with office and commercial shopping which has earned revenue for the city authorities by allowing the operator to charge only modest parking fees, that has helped the urban authorities to reduce congestion.

In Uganda particularly in KCCA, where is study was conducted, the British administration left behind a master plan that detailed the expansion trend the city.

However, this plan was not implemented and it partly explains the current poor infrastructure and uncoordinated physical planning [8]. During the 1970s and early 1980s, the economic crisis and civil strife that affected the country greatly hindered the development and maintenance of urban transport infrastructure. Like most Sub-Saharan African cities, Kampala is experiencing exponential urban growth and expansion at a very alarming rate. Uganda's population stands at 34 million people with an annual growth rate of 3.4%. Urban population however is about 3.5 million people growing at an annual rate of 5.1%. Kampala is relatively a small city compared to other cities in Sub-Saharan Africa like Nairobi, Addis Ababa, Johannesburg, Lagos or Cairo. Kampala typically remains with the narrow colonial built streets with winding roads across the hills and valleys. Such roads cannot accommodate the ever increasing traffic volumes. There are approximately 1,000,000 vehicles in the country, with a potential of additional 20,000 vehicles per year. Over 70% of these vehicles are plying on Kampala roads daily. This scenario has created a challenge of planning for the increasing importation of vehicles in the city creating high levels of traffic congestion, parking and pedestrian transport difficulties, massive air pollutants and an increase in greenhouse gas emissions [8].

2. Conceptualization

[7], urged that parking management as a tool for serving wider goals in transport policy and urban planning should match supply and demand. Parking management usually has multiple objectives including ensuring efficient road usage, reducing parking conflicts, generating revenue, ensuring urban regeneration, and above all, ensuring urban mobility management[15]. To ensure sustainable parking management, Sub-Saharan African cities are increasingly developing policies that prioritise urban parking while at the same time ensuring off and on street parking management. Such policies sometimes involve active management of on-street parking, designating special parking and no parking zones and enforcing parking regulations. These functions, that have traditionally been executed directly by local authorities, due to a number of factors including structural adjustment programmes (SAPs), expansion of public administration and the downsizing of the traditional civil service, are increasingly been contracted out to the private sector through PPPs.

PPPs as a policy model in urban management in the developed world can be traced to Carter administration in the United States of America. The Carter administration, for the first time, "articulated a national urban policy that encouraged public private partnerships and targeted federal aid specifically to improve the economic base of distressed central cities" [8]., in: [10]. Since the 1970s, public-private partnerships have become legitimate and effective tools for achieving a number of public purposes including urban parking management [14]. Globally, every city has had redevelopment programs implemented, at least in part, through PPPs. It is now conventional belief that urban problems cannot be addressed by governments alone but with the support of the private sector.

In sub-Saharan Africa, emergence of PPPs in urban management can be associated with a number of factors. First, the collapse of municipal administration

as part of the broader collapse of the entire public sector left no option but to bring the private sector in urban management both formally and informally[13]. Public corporations and parastatals that supported urban service delivery collapsed and were replaced by the Structural Adjustment Programme SAPs that emphasized private sector involvement in public management. At this period, urbanisation expanded so rapidly preceding the anticipated urban plans necessitating an inevitable arrangement between the private and public sectors in service delivery.

Since that time, PPPs have become an appropriate tool to address social and economic restructuring problems of cities by "integrating capital, leading sectors and favored social groups in specific locations" [9].; [11]. Hence PPPs have been supported by city officials in efforts to attain and institutionalize involvement of the private sector in urban areas and encouraging private enterprises to solve public problems. Conceptualization of the anticipated contribution of PPPs in urban street management is illustrated in Figure 1.

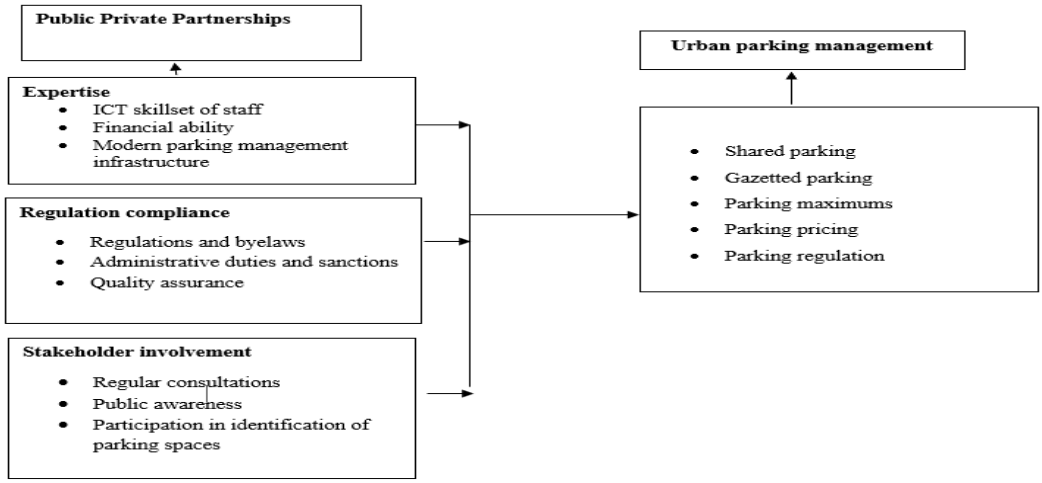

Fig. 1. Conceptualization of PPPs and urban parking management in Sub-Saharan African cities
Source: *Adopted from [10] and [12] and modified by the Researchers*

KCCA entered into a PPP with Multiplex Ltd, a private civil construction company to manage and modernize street parking in Kampala city Central Business District (CBD). Under this PPP arrangement, Multiplex Ltd. was required to roll out pay and display (P&D) parking meters, procure and deploy handheld meters on roads where P&D were considered unsuitable and to increase automated number plate recognition units thus easing enforcement. Vehicles on Kampala roads include private motor cars and pick-ups, goods vehicles, motor cycles and public transport fleet mainly public transport commuter taxis and single passenger commuter motor cycles (*Boda-Bodas)*. Large public transport buses in the city are limited. Dominance of small commuter taxis besides rapid urbanisation has resulted into serious traffic congestion and urban street parking challenges. Thus the primary objectives of the KCCA-Multiplex Ltd PPP were to provide safe, orderly, and fair street parking management by making urban parking as convenient as possible, while promoting

safe movement of vehicles and providing for pedestrian safety. These objectives were informed by an earlier study conducted by the Directorate of Transport in the Ministry of Works and Transport (2015), that found that poor urban park management was a key barrier to sustainable urban transport as it promoted road frustrations and resulted in perpetually costly traffic jams in the city.

3. Problem statement

KCCA is mandated under Section 7 of the Kampala Capital City Act, (2010) to, among other functions, regulate, order, and manage traffic congestion in the city. To execute these functions, a number of policy measures have been implemented to manage on-street parking at the same time encouraging off-street parking. For example, commuter taxis and other specialised service vehicles have been allocated gazetted parking spaces, operational permits for long term parking have been issued, parking management wardens have been introduced in the city, parking charges(fees) have been set up, short stay parking has been encouraged and above all, collection and administration of street parking has been contracted out to Multiplex Ltd [11].

On its part, Multiplex Ltd has stepped up pricing of the urban parking slots and established limited parking maximums in the city, enforced parking regulations and continued to organize training workshops for drivers and other street user, shared information with motorist and cyclists about efficient park management as cited in the KCCA Annual Report of 2015. However, a study conducted by Directorate of Transport in the Ministry of Works and Transport, (2015), revealed continued and increasing parking challenges in the city manifested in road frustrations and costly traffic jams threatening sustainable urban transport. This gap prompted this study to question the contribution of public private partnerships on urban parking management in Sub-Saharan African Cities citing Kampala City as a case study.

4. Methodology

To conduct this study, literature was reviewed specifically relating to PPPs and urban infrastructure provisioning specifically focusing on parking management. Secondary, a cross-sectional survey was conducted in 2019 in Kampala CBD. Questionnaires were administered and later interviews and groups discussions were conducted. Mixed data was analysed first quantitatively and later qualitatively before interpreting, concluding and making policy recommendations. Table 1 shows the sample size selection criteria.

Table 1. Sample size table selection criteria

Category of respondents	Study Population	Sample size	Sampling technique
KCCA administration staff	5	5	Purposive sampling
Multiplex Ltd staff	27	24	Purposive sampling
Drivers under Uganda Transport Development Agency (UTRADA)	187	123	Simple random sampling
Private motor vehicle users	300	169	Simple random sampling
Total	519	321	

Source: *Researcher, (2019)*

Data was analyzed by Pearson's Product Moment Correlation Coefficient and regression analyses were conducted to test hypotheses. Finally, findings were validated by interviews and groups discussions and are discussed as hereunder.

5. Key findings

Findings from the study were discussed under the three objectives that guided the study viz:

1. To assess the contribution of PPPs in urban planning management in Sub-Saharan African cities.
2. To investigate how PPPs regulations compliance contributes to the improvement of urban parking management.
3. To interrogate how stakeholders' involvement in PPPs contributes to improved urban parking management.

In line with the first objective, the study established a moderate positive relationship between PPP staff expertise and urban parking management and that improvements in PPP staff expertise leads to improvements in parking management. Conversely, decline in PPP expertise leads to decline in performance of PPPs. Thus for PPPs to improve parking management, their staff should possess requisite skills to undertake the delegated responsibilities. Table 2 shows the model summary where the coefficient of determination was 0.240 implying that PPP staff expertise accounted for up to 24% of the variance in urban parking management and the 76% is due to other factors.

Table 2. The model summary

Model	R	R Square	Adjusted R Square
1	.493[a]	.243	.240

a. Predictors: (Constant), Expertise
Source: *Researcher, (2019)*

To assess the overall significance of the model, the *Analysis of Variance* (ANOVA) was also generated and presented in Table 3.

Table 3. Analysis of Variables (ANOVA)

ANOVA[b]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	46.255	1	46.255	81.068	.000[a]
	Residual	144.352	253	.571		
	Total	190.607	254			

a. Predictors: (Constant), Expertise
b. Dependent Variable: Urban Parking Management
Source: *Researcher, (2019)*

For the regression model to be significant, the calculated p-value (level of significance) must be less than or equal to 0.05 (the conventional p value). For this particular objective, the calculated p-value of 0.002 was less than 0.050, therefore, the regression model was found to be statistically significant ($F=81.068$, $df = 1$, $p<0.05$ ($=0.000$)). The finding is that PPP's expertise had significant effect on urban parking management.

As to the second objective, the study established a moderate positive relationship between PPP regulation and urban parking management and that improvements in PPP regulations led to improvements in urban parking management. Strict parking regulations improved urban parking while relaxation in enforcing guidelines and agreed regulations contributed to the decline in compliance to urban parking management. Furthermore, findings indicated that when staff of contracted firms were fairly motivated this contributed to drivers 'appreciation of parking guidelines. These findings are presented in Tables 4 that show the correlation matrix between PPP regulations compliance and urban parking management.

Table 4. The correlation matrix between PPPs regulations compliance and urban parking management

Correlations			
		Regulation Compliance	Urban Parking Management
Regulation Compliance	Pearson Correlation	1	.515**
	Sig. (2-tailed)		.000
	N	290	290
Urban Parking Management	Pearson Correlation	.515**	1
	Sig. (2-tailed)	.000	
	N	290	290

Source: *Researcher, (2019)*

In relation to the third objective, the study established a moderate positive relationship between PPP stakeholder involvement and performance improvements in urban parking management. Similarly decline in PPP stakeholders' involvement contributed to decline in urban parking management in the city. Further findings revealed that consideration of stakeholders' views in integral planning and parking space demarcations management contributed to improvements in urban parking management in the city. The degree of direction of relations between PPP stakeholders' involvement and urban parking management was calculated using Pearson's Product-Moment Coefficient and findings presented in Table 5.

Table 5. The correlation between PPPs stakeholders involvement and urban parking management in Kampala

Correlations			
		Stakeholder Involvement	Urban Parking Management
Stakeholder Involvement	1	.608**	
		.000	
	290	290	
Urban Parking Management	.608**	1	
	.000		
	290	290	

**. Correlation is significant at the 0.01 level (2-tailed).
Source: *Researcher, (2019)*

Table 5 shows a moderate positive relationship between PPPs regulations compliance and urban street management at (r=0.515 p=0.000 N=290). This relationship is statistically significant at 95% confidence level as the p value of (=0.000) is less than 0.050 implying that improvements in PPPs regulations compliance is likely to improve urban parking management and vice versa. To establish the extent to which PPPs stakeholders' involvement influenced urban parking management, a regression analysis was conducted and the model summary presented in Table 6

Table 6. Showing the model summary

Model	R	R Square	Adjusted R Square
1	.515[a]	.266	.263

a. Predictors: (Constant), Regulation Compliance
Source: *Researcher, (2019)*

From Table 6, the coefficient of determination was 0.0263 implying that PPPs stakeholders' involvement accounted for up to 26.3% in the variance in urban parking management and the74.7% attributed to some other factors.

6. Conclusion

The study therefore concluded that engaging PPP in urban parking management reduces urban parking problems as it brings innovative approaches and creativity in parking space usage and in turn solves urban traffic congestion. Similarly, creation of gazetted parking spaces for specialised vehicles created additional commercial activities, that generated additional incomes and revenues for both city residents and authorities.

However, the study also concluded that provision of commercial activities in and around gazetted parking spaces had created additional congestion around these areas and increased the demand for parking spaced around these areas. Therefore, while planning for gazetted parking spaces, there should be balance between financial feasibility and the incremental number of vehicles that can fit in a particular gazetted area.

Thirdly, the study concluded that in alternative and in addition to promotion of PPPs to manage public street parking, urban authorities should encourage off street parking by licensing private-for-pay parking facilities. Incentives (such as reduced parking fees) should be put in place to encourage vehicles to park in these facilities and more stringent enforcement of street parking restrictions by urban authorities may make this another viable option both administratively and financially.

7. Policy recommendation

This paper makes the following policy recommendations:

1. Before undergoing into a PPP for street parking management, urban authorities should access the technological competence of the private firms such that only firms with proven technological capacity should be contracted. This recommendation is based from the study findings that revealed that street parking management requires sophiscated technology in form of automated ticketing, surveillance cameras and ICT based management skills.
2. Secondly, before contracting out street parking management, urban authorities should put in place a range of parking guidelines and regulations to be followed. Findings from the study revealed that the more stringent the parking guidelines and regulations, the more likely street parking management would succeed. Conversely, relaxation or absence of enforceable parking regulations and guidelines led to deteriorating street management and more difficulty for PPP firms to manage street parking.
3. Lastly, the study recommends that firms that undertake PPP in street parking management should have proven financial capability. The study discovered that parking management is a long term investment that requires long term concessions and can only be successful when firms have sufficient finance to invest in long term ventures.

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Learning religious knowledge in the context of a smart city

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Abstract

Learning means the accumulation, thinking, and application of complex knowledge, skills, and perspectives, and the advancement of communication technologies in the late twentieth century heralded dramatic changes in all aspects of human life. One of the concepts that has evolved due to technological advances in communication is the concept of the city. These new technologies have allowed the city to move beyond physical geography and into the realm of local relationships and into a new field and geography. Accordingly, the city, like other areas, has the opportunity to become virtual or smart. The smart city is emerging as a new way to solve many educational problems. This article analyzes the learning of religious knowledge in the context of the smart city through the method of libraries and documents. The achievements and results of this research include the development of friendly environments, changing the pattern of education, improving the quality of formal and informal education.

Keywords: *education, model, religion, intelligent city, learning.*

1. Introduction

In general, education is one of the most important tools in the development of human life and engage in education to achieve educational goals throughout their lives. Education is a tool for humanity to benefit from religious knowledge in addition to adapting to the environment and living better. Today, traditional

methods do not prepare people for the skills they need. With the advent of new technology, new ideas, tools, ideas and methods are emerging in various fields every day, and these methods are being published and used. In addition, there are significant developments in the field of education that lifelong learning, which is the same as non-formal education, has become especially important as an emerging theory in the 21st century.

2. Education

Education is a set of events that facilitate learning, and due to rapid technological changes in various aspects of life, humans have a large amount of information needed to survive, and increasing information and its alignment with large and rapid changes make information unstable. They have become and in the absence of continuous learning and active adaptation of what they have learned to dynamic living conditions, will not be updated quickly and will bring information. Therefore, Islam places great emphasis on Muslim lifelong participation because it helps them find their Islamic identity. This requires a lifelong learning process. (Shakerin Shari and Jamaluddin, 2012) Teaching and learning are divided into formal and informal types, and non-formal education, which as a lifelong learning is a new synonym for learning and is the result of the exponential growth of information. (Brahami, 2007) The development of knowledge, skills, interests and learning opportunities in life in the process of lifelong learning is preserved by individuals. In this type of learning involves the process of learning from cradle to grave without coercion and individual desire (Paterson, 2004) which he uses as limitless learning and information literacy (Brahami, 2007), the true nature of this type of education is to train a human being to learn how to find and open his intentions and thoughts to the existing human being. It is incomplete and will flourish only with education that is directed towards continuous and comprehensive learning. (Ahmadi Tavana, 1392, p. 44) Therefore, lifelong education should be presented as a set of guiding principles for the development of educational institutions.

3. Religion

Religion, which is also called religion; In the word, it means the way and method interpreted (Ragheb Isfahani, 1412 AH, vol. 1, p. 323), based on which it can be interpreted as the way and method that human beings adopt for their lives. Religion is also a worldview and a set of beliefs that seeks to explain a range of questions that arise throughout human life, such as how things and living things came into being, the quality of the possible beginning and end of things, and how to live. The word religion is one of the concepts that has always been in the field of various opinions and opinions of experts and there is no common agreement about it. In a way that even some researchers do not consider it definable. In any case, religion can be defined as follows: Religion is a set (system) of harmonious and proportionate facts of intellectual systems (beliefs and teachings), value system (laws and rules) and educational system (moral and social orders) that In the realm of individual, social and historical dimensions, it is sent by the Almighty God to guide

and guide human beings on the path of divine growth and perfection. In other words, it is a set of beliefs, laws and regulations that both consider the intellectual principles of man and speaks about the principles of his inclination and covers his morals and ways of life. (Tusi, 1987, p. 127) Numerous definitions of religion have been presented, such as the great Islamic scholar and esteemed commentator of the Shiite religion, Allameh Tabatabai, defines religion in this way.

1) Religion is composed of two pillars of belief and system, which are systematic religious beliefs and also religion as a system that contains divine laws that have been established to regulate and manage the life of all human beings. (Tabatabai, 1387, vol. 2, p. 228; Tusi, 1366, p. 69)

Or some Western scholars have said: Religion is the belief in spiritual beings. Or others have said: The religion of the system is a set of beliefs and practices related to the sacred things through which a group of people are related to the ultimate issues of human life. Others have said: Religion is the belief in an eternal God. . That is, the belief that divine government and will rule the world. And others write: The essence of religion is the feeling of absolute dependence. However, each of the Islamic and Western scholars and religious scholars have tried to provide a complete definition of religion based on their attitudes and beliefs. For this reason, they have emphasized various aspects in the perception of religion. Perhaps the most comprehensive definition of religion, according to the above explanations, which is derived from the Qur'an, is the definition given by the great Allama Hassanzadeh Amoli in a treatise entitled Science and Religion: Its etiquette and texts are pure knowledge and correctness. Inevitably, the compilation and arrangement of such a program is made by no one but the Creator of man, that is, the hand and pen that wrote the evolutionary book of the system of the universe and man in such a beautiful way that it is unimaginable and every word of their existence is religion and ritual. He has given that there is no way to distort them as much as a micron, and there is no way for them to be inconsistent, inadequate or inadequate. It is pure knowledge and the same right. Inevitably, the compilation of such a program is made by no one but the creator of man, that is, the hand and pen that wrote the evolutionary book of the system of existence of the universe and man in such a beautiful way that it cannot be imagined more beautifully. He has given that there is no way as much as a micron of distortion, discrepancy, inadequacy and inadequacy in them. To his ultimate goal and ultimate perfection. Every religion consists of at least two parts: 1- A belief or beliefs that have its basis and roots. 2- Practical instructions that are appropriate to the ideological basis or foundations and arise from them. Therefore, it is quite appropriate to call the section of beliefs in any religion "principles" and the section of practical rules "sub-sections" of that religion.

4. Smart city

Smart city is a term from which different interpretations are presented. The following difference is in three of the existing definitions for smart city, the main points of which are as follows:

A. A smart city is formed based on the intelligent exchange of information between different systems.

B. It is a smart city that by investing in human and social capital, traditional and modern infrastructures of communication and information technology, ensures sustainable growth of high quality of life. This is not possible except with intelligent management.

C. A city that optimizes the efficiency and effectiveness of necessary processes, activities, and services, and a city that modifies its behavior in response to change. (Rastegari, Yousef, Hassan Haghighi and Seyedeh Zahra Sajjadi, Content Analysis with the Aim of Strategic Planning of Smart Tehran, Tehran, Shahid Beheshti University, 2015)

Based on the smart growth approach, the term influences development decisions on everything from personal life to communities and nations. In order to overcome the side effects of development, smart growth strategies can maintain and develop healthy, safe, and easier urban environments. And charming help (Karadag, 2013) This is the first term about Brisbane

5. Learning

E-learning is one of the types of distance learning and has different meanings for different people that is done through the Internet and is defined by the following features: Including content related to the learning goal, using interactive methods such as examples and images to present text, Develop new knowledge and skills related to individual learning goals or related to improving organizational performance that includes several elements that include e-learning courses that include content and training methods that help people learn content; These courses are conducted through the computer with the aim of achieving the goals of personal learning. Dividing learning into lifelong learning means the continuous growth and improvement of knowledge and skills required for employment and personal realization through formal and informal learning opportunities. So learning is a part of life that happens anywhere and anytime.

Learning in different eras and over time, the definitions have become more complete and acceptable than before, so that advanced teaching methods have changed learning and there is no need for physical presence in environments. (Fatehnejad, 2007) These definitions Different learning has not shown a lack of comprehensive and uniform definitions. Some believe that learning is a change that occurs as a result of experience or training in living behavior. In this type of (lifelong) learning, the person is engaged in lifelong learning. In this learning, individuals continuously increase their knowledge, skills and interests in life. Informal or lifelong learning is the process of acquiring knowledge from the cradle to the grave without limit. (Richardson, LD and M. Wolfe, M. principles and practice of informal Education: learning through life, Routlledge, London, 2003)

Informal learning is about conscious and unconscious daily processes that lead to the acquisition of competencies. Informal learning occurs at the individual and organizational levels, and this learning is more random and may not be recognizable by the learner. (Allandrin, 2010, 260) And this type of learning has characteristics such as being mainly self-guided and guided by the learner in the

sense that the person himself forms his learning activities and situations (Gables, 2010; Tannenbaum, 2010) Informal learning involves action and activity and the person actively performs an activity and integrates with everyday life (Klaus, 2010; Marsik et al., 1999 and 2010). This type of learning is stimulated by internal and external stimuli and in the form of It is not conscious. In this type of learning, the responsibility and management of learning is assigned to the learner and the person learns the learning method.

6. Conclusion

Learning based on formal and non-formal education has undeniable educational and moral features, but in the electronic course of formal education, which is not about the classroom, blackboard, desk, etc., non-formal learning or lifelong learning of emergence It is more and requires the development of friendly environments and patterns related to this change, and learning religious teachings that require lifelong learning requires changes in the pattern that a person, wherever he is, from home, offices and organizations can easily Learn valuable religious sciences.

Learning religious teachings is one of the sciences that a person learns in order to have a happy life.

1. What is the meaning of religious sciences and why should it be taught?

2. How important are these sciences and how many people and at what level should they study these sciences?

But the answer to the above questions:

1. The science of religion refers to any knowledge that leads to our better and more accurate knowledge of religion. Some parts of this knowledge can be directly related to religious topics and are exclusively in the field of religion, such as the knowledge of interpretation which is directly related to the Qur'an, a book that is the most important source for the study of Islam. Sciences such as jurisprudence and theology can also be studied in this section. Another part that is taught as the premise of religious knowledge, although not directly related to religious sources, is needed to better understand religious sources; As in the various disciplines of Arabic literature, although the benefit of learning such sciences is not exclusively for the knowledge of religion, but in any case; Because the official language of our religion is Arabic; Anyone who decides to study and explore the religion of Islam, from learning such a part; As an introduction to his research; It is not unnecessary.

Of course, in a variety of contexts, other, perhaps seemingly unrelated, disciplines can be taught and put to use in the religious sciences (such as learning other languages or computer science and propagating religion using them).

But why should we learn religious science ?! It seems logical to answer this question when we consider the principle of our and society's need for religion as certain and then we have ambiguity in learning religious sciences. In other words, the need for religious sciences is a subset of the need for religion. If a person mistakenly believes that man does not need religion, it will be completely useless to talk to him about religious sciences, but the reasons for man's need for religion must first be stated for such a person.

But if a person considers the principle of religiosity to be necessary, but doubts the importance of learning religious sciences, we ask him what is the way of religiosity if we want to be religious? How can we know religion and clear up our ambiguities about different aspects of religion and get answers to our questions ?! And are there more than three ways in this regard ?!

A: ourselves; Like the Prophets (PBUH) and the Imams (AS); To be in touch with the unseen world and to receive our answer directly from God, or after proving their mission and Imamate with miracles and visions, to make them our guide and to adhere to whatever they command.

B: or in any case; Without any background in studying and studying the science of religion; Considered his personal opinion correct or with the first seemingly religious person we met; And without knowing the extent of his knowledge; Ask your question and give his opinion; It is not clear according to what style and framework it is expressed; Let's act.

A: And finally, either we learn the science of religion ourselves and we can get answers to our questions by learning the ways of knowing religion, or we can ask people who have followed this path to clear our ambiguity.

And there will be no fourth way.

Now we will analyze the above:

A: The first case can be the most accurate way, but with the end of the prophecy and the absence of the last Imam (AS), such a possibility does not exist for us. By the way, we know that even during the life of such leaders; They; Due to the lack of advanced means of communication; It was not possible to have direct contact with all its followers, and a large part of the propagation of the religion was done by people who had already received the necessary training from these leaders. Some may still claim to have a direct relationship with God and the infallibles, but such a claim; Due to lack of sufficient and necessary documents; It cannot be accepted, especially if people are deprived of the necessary religious knowledge and make such a claim the only way to attract their followers and worldly purposes!

B: If any fair person considers the second way, he will realize that acting in such a way will end in nothing but religious chaos and will basically remain a single religion, but each person is a separate religion and It is different from others and religious deviations as well as superstitions will spread in the society! The invalidity of such a method is so obvious that it needs no further argument.

A: Given that now, the first method is not possible and the second method leads to the destruction of the basis of religion, the only way that remains to receive religious concepts and issues is that according to the available sources; Such as Quran and Hadith; Learn the correct methods of exploitation and inference from them using the experiences of past scientists, and in this way, preserve our religion and pass it on to the next generations, and there will be no fourth way, and if you think of another way. Please send it to us. Thank you for analyzing it and letting us know the result.

Given the important role that learning religious issues plays and transmitting them to others in protecting religion, the Holy Qur'an advises believers that even in times of war and jihad, a number of people; To learn religious knowledge; Stay in

Medina until, after the return of their Mujahideen brothers, they teach them what they have learned. However, this verse can not indicate the exemption of a religious student from jihad, but according to Imam Baqir (AS), it only observes the turn of individuals in sending to the fronts; That is when the jihadi forces are sufficient, but placing jihad and learning the religious sciences in one category alone is sufficient for the importance of teaching such sciences, and there is no need for another reason.

B: Learning is either for the learner to do his homework or to teach and educate others

But learning to act and do homework; In a general division, it should be divided into two categories:

The first category of rulings is related to all Muslims and has nothing to do with occupation, age and gender, but in the first place applies to all obligees; Such as the rules of prayer, fasting, khums, etc.

The second category belongs to a certain stratum of society, so it is necessary only for the same stratum to learn it and not for the rest; Like merchants who trade rules for their business such as types of transactions, false and correct transactions, types of options, right of termination, etc., or farmers who have to learn farming, masakat, etc., so we see our scholars using They say from verses and narrations: It is obligatory for a person to learn the things that he often needs.

But about learning to educate others; It should be said that firstly: learning the sciences of religion is not exclusive and we do not consider the religious researcher to be limited to the students of the seminaries in which they are officially studying, but all religious people should meet the needs of the society; Without quitting his job; Learn about religion as much as they can.

Obviously, the type of education and the level of expertise of these people; In addition to innate talent; It depends on the amount of time and effort they put into it. But given the spread of religious science, which naturally takes a lot of time to learn, people have to give up other affiliations; Spend more time in this way. The number of these people and in which religious field they will study will depend on the amount of society needs in relation to religious issues.

Second: Just as the principle of religion and religiosity and belief in spirituality are necessary for human beings, so must individuals; To know the correct and accurate religion; They should be educated so that religion does not deviate from its true path and suffers from deviations and superstitions, and this alone justifies the importance of learning religious sciences.

Finally, it should be noted that criticism and questions about the methods and types of sciences that are taught in this regard are not forbidden, and for example, the question can be asked whether, for example, a certain knowledge, Is it considered a religious science and does its teaching and education have any benefit or not? Or why in some fields related to religious sciences, more investment has been made, while the need of society for other religious fields is felt more ?! And should the method of propagating religion be limited to the old methods or should new methods also be tried ?!

Such criticisms have been voiced by religious scholars themselves, and many of them are initiating new methods of teaching and propagating religion.

But it should also be noted that criticism of anything must necessarily be accompanied by a practical proposal or a better method, otherwise it has weakened the old institutions with its criticism, while not replacing the new one with a better performance. We and such criticism can not be considered constructive.

The Holy Qur'an considers education one of the goals of the mission of the prophets, says: "I'm kickin W est Az Ali Ali Al Baath Fyhm messengers I Ytlva Nfs·hm Ayath and Yzkyhm and Ylmhm the Book and al-Hikmah and my foolish they might goeth before the faithful expression of God's grace "When a prophet arose among them to recite to them His revelations, and to purify them, and to teach them the Book and Wisdom, and before that they were in manifest error." (Al-Imran / 164)

In another verse in addition to teaching the Book and Wisdom, teach "what they did not know" that: "We Fykm Rslna messengers Mnkm Ytlva Ayatna and Yzkykm and Ylmkm upon the Book and al-Hikmah and Ylmkm Tlmvn as we lounged Tkvnva "We sent a messenger from among you to recite to you Our revelations, and to purify you, and to teach you the Book and Wisdom, and to teach you what you did not know." (Al-Baqarah / 151)

Learning based on formal and non-formal education has undeniable educational and moral features, but in the electronic course of formal education, which is not about the classroom, blackboard, desk, etc., non-formal learning or lifelong learning of emergence It is more and requires the development of friendly environments and patterns related to this change, and learning religious knowledge that requires lifelong learning requires changes in the pattern that the individual, wherever he is from home, offices and organizations can without worry to Learn valuable religious sciences.

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Creative philanthropy and smart cities

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Abstract

The" creative philanthropy" is more and more present in recent debates and studies, along with models of" charity/ service"," scientific/ philanthropy" or" new scientific" approaches. Belonging rather to the third model, "creative philanthropy" is a basic characteristic of the new philanthropy at the beginning of the 21st century that offers some of the funds to take a different way to help the society. Anheier & Leat (2006) appreciate that "philanthropy is experiencing a crisis due to a lack of awareness about the potential that foundations could have. The ability to overcome this crisis provides the key to reinventing philanthropy as a central institution of modern society". In this context, creative philanthropy becomes a central issue of today's philanthropic foundations. The progress of smart cities is to be added to the issues researched before. Recent field literature offers a numerous example of cities where" philanthropy is integral to progress". This study is a detailed approach of the conjunction/contiguity between creative philanthropy and smart cities, offering arguments and development support for more extensive studies in the future.

Keywords: *creative philanthropy, smart cities, innovation.*

1. Introduction

In my talk I present the activity of some creative funds and the problems they choose to solve. I argue that such funds can be integrated into the development of tools that will help smart cities to improve the life quality they provide. The creative

grants making foundations have the ability to help in defending and developing new approaches to improve life quality in smart cities.

The discussion today is about the connection between two terms: "philanthropy" and "smart cities", and is especially about the contribution that "creative philanthropy" needs and can add to the well-being of the residents of these cities. I will first define the two terms- creative philanthropy and smart cities. Then, I will suggest a way in which the two terms can be combined for the benefit of the residents in the smart cities.

Until the end of the 19th century, the world has been dominated by three main methods of helping the needy, each method was developed and molded according to the existed understanding of the needs and what is proper to do at that time, and to the purpose's donors will be willing to donate. During the last century needs changed new approaches and methods had to be developed to meet the updated needs.

The earliest approach that started during the biblical period and lasted until the 19th Is the charitable approach. (Harrison and Andrews 1946; Andrews 1974; Parochaska 1990; LAGEMANN 1999; Smmith 1989; Scealander 1997; Karl and Karal 1999) According to that approach the once that can donate directly or through an organization gave money to the poor. This approach was developed because at that time governments did not gave any or adequately help to those who are unable to help themselves - the poor, the sick, widows, orphans and so on. This help was given primarily from a religious vision of doing good in the eyes of God, so that the donor would have a better life in the next world. Help was given through various religious organizations, groups of the rich, and various associations. According to this method, they gave food and money to the poor. Those who were lucky enough were included in the beneficiary group, the rest needy once were not affected and the general systems did not change. The hope was that the various bodies would help until the government will take on the role of support (Anheier and Toepler 1999).

In the early 20th century, many opponents arose to this approach of "giving fish and not fishing rods" (Bulmer 1995,1999; Nielsen 1985; Karl 1997; Smitt and Borgmann 2001). The opponents advocated an approach that argued that before giving out money the community should investigate the causes of poverty and solve scientifically the causes, once the cause is resolved the problem will disappear. At that period western world was fascinated by the development of science and engineering and was convinced that all problems could be solved by using engineering and or science. With all due respect to that approach and although many governments have also joined the effort to solve the issue of poverty, it has not been resolved and there are still people who cannot take care of themselves and their families.

Additional approaches to philanthropy have developed - strategic philanthropy, venture philanthropy, social investment (Breiteneicher and Marble 2001; Carrington 2002; Emerson 2004; Porter and Kramer 1999; Reis and Clohesy 2001). It is now common to call all of these methods collectively as "new scientific philanthropy". Those approaches came to the world as the new doners that usually are business owners are used to think in a certain way and they want to see the philanthropic entities managed as businesses, in which everything including overhead cost

control, performance and results are measured and reported. Some times the cost of measurement and reporting was more than the donation.

In addition to the new settings during all the time and, in parallel, various charity organizations continue to donate money to the needy-to education, health care, medical research and various religious needs.

In light of the large amount of money transferred to philanthropy recent years, many new funds and charity organizations starts to operate. On top of the philanthropic funds the governments increased involvement in helping the needy, some funds understood that in order to be attractive to the donors they have to be unique, they have to develop an additional approach to using donors' funds, see "Creative Philanthropy" (Halmut K. Anheier, Diana Leat 2006).

As per the approach in the book the world of philanthropic funds or organizations can be split into two gropes: Group A – the big one that will include entities, Charity organizations and funds that raise money every period and spend the money for pre-defined purposes. Group B will include mainly funds that have money or money's worth that allows them to operate over time regardless current donations. Usually, those funds spend each year only up to the profits they get from the money or property they have. Those entities or funds that are free from the constant need of raising donations and form the constant need to please the donors, can and should develop another model of philanthropy. They can be more creative, take bigger risks, they offered the name – "Creative grants making foundations". These funds need to add additional capacity to the philanthropic world (Anheier and Leat 2002). The funds need to create for themselves a unique role of developing innovated thinking and tools to implement the innovative solutions to problems. They have to try new things which some of them may fail. The tools and ideas that will prove themselves over time can be given to others for duplication.

On December 2018 "The Chronicle of Philanthropy" published a special addition regarding "Philanthropy and City" in which the philanthropic specialists Drew Lindsy Ben Gose, and Allex Daniels described the contribution that local philanthropy made to help the cities Denver, Chattanooga, Columbus and Tulsa. As we will see: the work that the local citizens and local business was important but that it was mainly contribution of money to develop the local services. The proposition in this paper is to use creative philanthropy funds to develop new tools and ways of thinking that will be incorporated in the developing of smart cities the cities that will be included in the projects and other cities that will adopt the solutions.

The topic of smart cities will be discussed at this conference, and for the purpose of my discussion I adopt the definition that was presented at the 6th conference for smart cities in India: "a smart city is a high-tech city that in fact largely includes the most advanced technologies to enable their citizens a better life quality or alternatively a futuristic city that seeks to alleviate obstacles to rapid urbanization. A city that is runed more efficiently by using real-time systems in order to provide good service. I prefer not to go into the definition of "what is better life' or better life to whom" I will leave that questions to be answered by each city citizens.

There are several examples of a smart city that have been originally established as a smart city: Masdar at Abu Dhabi, Songdo in South Korea, IT valley in

Portugal. Unfortunately, none of them is a success **(***see report at ICACC 2016 in India)* but there are many cities in the world that have adopted various components of smart city to improve city management of energy, transportation, water, Waste, Health, Security and Communication with Citizens (http://bsigroup.com/ LoccalFiles/en-GB/smart-cities/resources/BSI-smart-cities-report.

The Ministry of Urban Development of India announced that up to 2023 they will include 100 cities in the program of smart cities. The US Department of Transportation launched on December 2015 the Smart City Challenge asking mid-size cities to develop ideas for an integrated, first-of -its-kind smart transportation system ……" 78 cities accepted the challenge and submit idקas and willingness to invest.

There are now accepted standards for examining smart cities and for cities thar want to became smart cities, a very well-known standard system is the BSI of the UK.

Different cities have different reasons to why they want to become smart cities and the common reasons are: to improve efficiency in city management, changing the positioning of the city, improving sustainability (Arbes. R and Bethea, C. (2014), promoting economic development and so on.

The literature presents 6 principles in smart city development (Joshi Sujata, Saxena Sakshan, Godbole Tanvi, Shreya, 2016) Social, managerial, economic, legal, technological and sustainability. Once the city management takes into the considerations these factors the development of smart city will succeed.

The importance of smart cities increases greatly if one takes into account that according to a 2012 UN report; about half of the world's population are moving to cities and the urbanization trend is large. Cities in their current state will probably not be able to afford a reasonable standard of living for the growing population (BORJA, J. Counterpoint 2007; Toppeta, D. 2010.).

2. Creative grants making foundations

In order to discuss later the possible contribution to the smart cities I will represent some Creative funds and the contribution they give to the community they operate in.

Although these are philanthropic foundations it seems that their contribution is not necessarily in the areas of helping the poor but in improving the quality of life of the community and state in which they operate. I will introduce different approaches of innovative philanthropic funds so that we can use them or similar ones to improve the quality of life in smart cities.

2.1. The Wallace Foundation

This is a family fundation that was established at 2003 as a result of merging of some smaller funds that the family had. At 2004 they had 1.3 billion US$ and distributed 61 million US$. The foundation currently has 10 board members.

The Wallace Foundation has three objectives:

- Strengthening education leadership to improve student achievement
- Improving after-school learning opportunities; and
- Expanding participation in arts and culture

President's message, Wallace Foundation 2003 said "

A single goal unites our work in each area: to foster fundamental improvements not only in places where we make grants but also in places where we do not. We have a single way of working: we invest in both the development of innovative ideas in specific sites, and in the development and spread of knowledge to inform policy and practice, not only in the sites we fund but also in many others beyond our direct reach. And, the real test of our success is whether practitioners and policy makers are persuaded by the evidence of our work to use it without our financial support.

Sample of a Current program

Education Leadership Initiative: State Action for Education Leadership Project - its aim is to strengthen the ability of principals and superintendents to improve student learning, including a major effort to support innovation in the states' laws and practices.

As a result of the fund efforts the following changes have been made: shift from efforts to expand the labour pool of new school principals to a focus on strengthening the ways principals work (based on three labour market studies that firmly contradicted Case studies of the widespread assumption of a nationwide principal shortage); states had established ways of bringing together key constituencies to promote the importance of school leadership and evaluate possible policy options; five states had changed certification requirements; three had revised alternative licensure rules; and three enacted new leadership preparation standards. These changes are one example of the way in which a foundation-supported learning has had a significant impact both on grantees and more widely.

I will not list all the changes that this foundation has initiated and implemented but we have received a clear example of the contribution that such a foundation together with the community can make in identify a problem and find solutions in order to promoting the community.

2.2. The Rosenberg Foundation

Max Rosenberg, a San Francisco businessman and philanthropist, died at 1931 and left the bulk of his estate to establish a foundation with broad charitable purposes.

In the year 2003 they had assists of about 60 million US$ and gave about 3 million US$ as grants.

Max Rosenberg gave a list of purposes the foundation might pursue, mainly oriented towards social justice and the "conditions of the working man".

The foundation's early grants were concentrated in the fields of public health, intergroup relations, education and community planning. In each of these fields the

foundation had a particular interest in applications to rural California and the wellbeing of children in the state.

The foundation is recognized for its influential policy work on behalf of immigrants and minority communities. 'Rosenberg's work on immigration policy began in the 1980s, when it supported background and public education work leading to the passage of the US Immigration Reform and Control Act (IRCA) of 1986. The act provided opportunities for millions of undocumented immigrants to legalize their status and begin the process of naturalization. Through its networking and grantmaking, Rosenberg helped build a coalition of community groups, churches, employers and unions to help immigrants take advantage of this onetime opportunity' (Siska and Lamb 2003). In the 1990s, Rosenberg supported a successful legal battle to overturn California Proposition 187, which prohibited state public health and education providers from serving undocumented immigrants, and later an effort to prevent withdrawal of welfare benefits. 'Through its work, more than 50,000 people were able to obtain US citizenship and protect their welfare benefits' (Siska and Lamb 2003). In 2003, the Rosenberg Foundation was one of three foundations that received the Paul Ylvisaker Award for Public Policy Engagement of the Council on Foundations.

Drivers of a Creative Approach in the fund

In interview, the foundation's current President attributes its adoption of a creative approach to five key factors:

- 'Being the only game in town' when the foundation was started meant that there was no dominant model of how foundations work and, at the same time, lots of proposals and ideas coming through.
- The fact that the foundation began during the Depression, which heightened awareness of the nature and roots of poverty, especially in rural areas.
- Having a diverse board with a few strong personalities willing to take risks.
- Having a board made up of people who had the confidence to act creatively, and who did not feel that their personal positions were threatened by doing so.
- The recruitment of energetic staff who went out to look at projects and conditions, practicing 'philanthropy as an interactive art'.

2.3. The Joseph Rowntree Charitable Trust

This creative fund is active in the UK, donates out its profits about 5 million pound every year. Unlike the other funds it is involved in the national politics in promoting: human rights, freedom of information, fighting racism, strengthening underprivileged communities. The fund is also unique by using its investments in stocks to promote ethic "Trustees are advised by the Ethical Investment Research Service (EIRIS) on companies in the portfolio or being considered for it. … If a company in which the trust has investments fails to fulfil its ethical criteria then the trust writes to tell them why it is withdrawing and, in some circumstances, might make that public."

The trust's current aim is 'to show that, with Trustees and staff working together, a foundation like JRCT can stay at the forefront of creativity and innovation, can continue to take risks in tackling difficult and contentious issues, and can be a challenge to the status quo... [and] continue to be a powerhouse for social change to create a fairer and more just world' (Joseph Rowntree Charitable Trust 2000–02: p. 5).

The trust describes the policy underlying its racial justice program as follows: 'The Racial Justice program supports projects and individuals working to: promote issues of racial justice with policy shapers, decision makers and opinion 110 Case studies of creative philanthropy formers; empower black and ethnic minority people to contribute to policy development; challenge racism and racial injustice and promote communication and co-operation between different racial groups. The Trust seeks to encourage work aimed at furthering its objectives in the European Union (EU) as well as in the UK' (Joseph Rowntree Charitable Trust 2000–02: p. 24).

A study regarding the fund concludes that 'by investing a comparatively small sum of money in the right place at the right time, the JRCT influenced policy debate.

This foundation is an interesting example of how a relatively small philanthropic fund has taken up the issue of promoting the quality of life in the underprivileged community of minorities by improving social justice, promoting understanding and recognizing interracial racial issues together with the community creatively in the region, country and beyond.

2.4. The Victorian Women's Trust

This is a complete different creative philanthropic fund. This is a fund that is located at Victoria in Australia and its moto is mainly to make a difference in women's lives: the vision is of a "just and humane society in which women enjoy full participation as citizens, free of poverty, discrimination and disadvantage". (www.vwt.org.au).

On top of that different vision the fund was created by the government of Victoria to marked the 150th anniversary of British settlement in the region that later became Victoria, and was a gift to the women of Victoria in recognition of their role in the founding and development of the state. The gift of 1 million AS$ was a nice act but it is not enough to enable them to do the activity they think is there mission. So, on top of the income from that amount they have to raise money, they collect membership fees, get individual donations, and grants from other foundations, and even from the government. Despite the financial pressures the fund is doing many activities and is leading processes that are changing the country. Out of all the projects I will mention only one that was published under the name "The Purple Sage Project".

The project was a response to 'a widening gap between rich and poor, continued high unemployment, reduced standards of community service, increased strain on local communities... the loss of public assets, racism and social tension, and a serious erosion of our democratic rights and culture.' (Victorian Women's Trust 2000: p. 5).

Using a system that is similar to round tables they set up thousands of groups across the country, groups discussing issues that concern the public. The process made people talk to each other and show them that the problems are not personal, they are general ones. The groups came up with ideas and prepared detailed working papers. The documents were compiled and the conclusions were refined and published publicly. The publication created expectations for change and in the elections that followed the publication, the government fell. There were claims that the post had a part of the fall.

Helped to defined correctly the problems and offered solutions.

Gave hope to improve immigrant's life quality by pushing to change state laws, helped to create community coalition to enable the application of the laws. Fight national wide and abroad to improve life quality of underprivilege people by using national politicians. Promote women rights. Fight national wide and abroad to improve life quality of underprivilege people by using national politicians. Promote women rights.

3. Conclusions

The accelerated process of urbanization as seen in practice and as reflected in UN reports requires city administrators to change the form of city management, by using advanced computing technologies to improve the physical system of cities and to become smart cities. Countries have understood the challenge, different countries are working to promote hundreds of existing cities to smart cities. As a result of physical location, economic ability, image composition, vision, etc. the challenge is complex, the needs in the different cities are not the same.

Establishing new smart cities from scratch is a very big challenge that requires an investment that does not seem to be possible to raise. Existing city managers are interested in improving the quality of life in cities by investing in existing technology, the decision on the directions of development is often random depend on the aspirations of the politician's aspirations or depending on the city economic capacity or he quality of the technology salesman. The physical issues are handled by engineers and economists, they are very similar in the different cities. The issue of treating a weakened population is very different from the issue of dealing with the physical issues.

Questions like which problem solve, how to solve the problems, how to make the solutions accessible by the users, how to convince the residents to use the tools, are questions that have the most complex answers. In most cases the city administrations know how to operate the systems but not necessarily define new systems. The tool that exists today in many countries - Creative grants making foundations is a tool that has the money, knowledge and experience to mobilize the community to define social problems and develop solutions. Those funds have the ability to distill the solutions so that the ideas can be transferred from one city to another while making the necessary adjustments. I suggest to the city managements to turn to collaborations that will give the funds the uniqueness and impact on the

quality of life in the future city and improve the quality of life as the city managers want.

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"The tale of two smart cities"

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Abstract

Ante Scriptum: Every leap of development or revolution in the history of human civilization had as its preamble a period of theoretical searches and confrontations, which were the catalysts of the respective shifts in the historical paradigm. Theorizing has its purpose, and the aim of this paper is to pave the way for an adaptation of architectural theory to new concepts related to the smart city model. We also investigate the predictability of the destiny of the smart city organism and the possible directions of morphogenesis. This article was translated from Romanian by the author.

The study is based on revisiting the concepts of place and limit with new connotations developed by technology that has a mediating role vis-à-vis the individual and communities. By redefining them, the concepts acquire characteristics of variables or mathematical functions, which can effectively study or generate future behavior patterns of smart cities, these dual territorial entities, with body and, here, an artificial intelligence AI (IoT, applications, cloud, software). One of these models is the theory of catastrophe, which can predict the limits of acceptance of phenomenological saturation (in the philosophical sense of Jean-luc Marion) by the individual, or in extremes, by society. We will describe how the theory of catastrophe can be applied using notions of quantum architecture theory, and how the philosophical system of donation described by Marion can help draw the boundaries of the existence of the smart city.

The approach is theoretical using inference, observation and exemplification through case studies. The research methods can only be of an eclectic and interdisciplinary nature, linking the theories of architectural atmospheres, of the donation of phenomenological philosophy and of applied mathematics. The method of translating into quantifiable variables the values of place and limit, is based on the loading of the notion of place of Christian Norberg-Schulz, with valences connected to the specificity given by the mediation of technology between individual and place.

The results are models of behavior of a bivalent nature, philosophical and mathematical, to describe a new theory of architecture, a theory of the smart place. This type of architectural place with its set of parameters, is a

new element of study, in continuation of research in the field of architecture aimed at reducing risk and preventing losses from hazards that threaten this smart city, either anthropogenic or natural.

***Keywords**: smart place, smart limit, saturated phenomenon, catastrophe theory, smart atmosphere.*

1. About places

A new association of forces between the theory of architecture, with its predominantly phenomenological approach, and the study of the development of smart cities with the issue oscillating between performance and ethics, is likely to create a new research space, that of smart place and limit with a dual methodology, humanities and mathematics.

The theory of architecture offers us some famous examples of defining the place, coming from various fields of interest. At first sight, the word "place" –" loc (Romanian)" seems easy to understand and is frequently used, being part of the main vocabulary of the Romanian language, having here a clear etymology from Latin, respectively "platea-plateae" or "locus-loci" [1]. The first definition on-line appears to us unequivocally:" a place is a particular position, point or area in space; a location". Here is the fountainhead of the search for meaning: a first critical question arises, namely, "determined by whom, in what way, for whom?". Another, more provocative question: "which space?". The hermeneutic adventure begins here, because place and space are basic concepts of architecture.

A simple exercise would be to try to offer this so familiar word some definitions of equivalence: place is a physically and theoretically delimited space; the place is a uniquely identifiable area; the place is a unit of measurement of perception in architecture. As we get closer to the essence of its definition, we introduce new concepts that take us even further away from it, in a pattern of a "strange loop" [8]. If we were to choose a poetic definition, the place could be seen in the manner of the American writer Robert Pogue Harrison, in the tradition of the same strange loop. "*In the fusion between place and soul, the soul is a recipient of the place to the same extent that the place is a recipient of the soul*" [4]. Can we find satisfactory definitions for this concept? Like any concept, it evades us, and all we can grasp, as a continuous or serendipitous feature of the place-thing, is its identity. "*If we think of belonging together in the customary way, the meaning of belonging is determined by the word together, that is, by its unity. In that case, "to belong" means as much as : to be assigned and put into the order of a "together", established in the unity of a manyfold, combined into the unity of a system, mediated by the unifying center of an authoritative synthesis"* [7] - if we are willing to link the concepts of identity and place, we find the first in Heidegger assimilated with the previously cited notion of "belonging-together" [6] and the second extended to the broader idea of topology by the same thinker. We thus remain prisoners of a hermeneutic circle.

In order to befriend this abstract "place," we can bring it closer or appropriate it by adorning it with limits. The previous statement may seem out of place, but just

as we can only describe an unknown person through attributes that limit the degree of ambiguity for a third party, so we can define a place by fixing it within its limits. We can explain spatial limits (neighborhood, park), cultural limits (areas loaded with a unifying tradition), exhaustive limits (coordinates of the nature of longitude and latitude to define an exact geographical position) or atmospheres (places of street events, occult or deification gatherings). Another kind of limitation is the concept of Christian Norberg-Schulz, so well-known to the world of architectural theorists, *genius loci*. Originally, a Latin term that translates as a spirit of those spaces that are inhabited or dedicated to human activities, being a supernatural entity adored in the Roman religion:" nullus locus sine Genio" (*Vergilii Aeneidos Commentarius*). The Norwegian theorist nostalgically redefines this *genius loci* for the theory of architecture. A concept very adaptable to cultural entities, which draws its juice from the eloquence of tradition and is invoked to justify and imagine architectural atmospheres, helping to identify a place in relation to another, thus limiting it , but retaining its ephemeral and immaterial character [15]: "*Architecture means to visualize the genius loci, and the task of the architect is to create meaningful places, whereby he helps man to dwell.*" [16]

Here is how we managed to highlight a symbiosis between place and limit, in which the first has the role of introducing the limit in space so that space can be appropriated, lived through *Ereignis* ; "*A space is something arranged, ceded, liberated, namely in view of a limit, in Greek peras…Space is, by its essence, what is arranged, what is introduced into its limit.*" [5] The way in which this appropriation happens as a phenomenon is in architecture by edification. We see edification as more than mere construction, namely as construction augmented through representation. We can even see an interesting solution to the problem of the birth of architecture as follows: architecture appeared with the first construction bearing the intention of representation. (We can thus bravely frame the cave of Lascaux in the field of architecture arguing its character of representation, of edification through art, and we can exclude bold constructions like Emley Moor Tower for the lack of this representative character).

1.1. The smart place

We see that the place is neither obsolete nor negligible a notion in the field of architecture or urbanism, therefore it must be of interest and in connection with the study of smart cities. After all, the smart city starts from a material structured framework dominated by the laws of architecture and construction engineering, invaded then by the overlapped, complex and interdependent systems of urban life: transport, infrastructure, administration, education, health, recreational activities, representing the vegetative nervous system of the urban body. But the smart city has a new feature, which we can assimilate with its own central nervous system. It is about the ability to synthesize large volumes of data collected from various sources using advanced technologies (IoT, applications, sensor systems, video camera systems), by processing them, in order to generate solutions and adapt real-time urban functions. The premises for defining a concept are met: the *smart places*,

which unite the field of interest of the place as an essential working concept of architecture, with the database generated by it in real time and with the effects of analyzing this amount of data, respectively self-regulation capacity.

Such an intelligent place has three main characteristics:

- **The architectural origin**, i.e. the geographical location and the built ensemble (together with physical infrastructure necessary for their functions) dominated by one or more defining landmarks (here is an example: Piata Victoriei in Bucharest, with its iconic landmark Victoria Palace of the architect Duiliu Marcu-1937);
- **The architectural atmosphere** that gives it *meaning or heading*, this meaning can be one of attraction or rejection with all intermediate degrees, including that of indifference, depending on individual perception or public opinion at a given time; this intuitive assessment of the local atmosphere was linked both to peripheral perception [16] and to the relationship with political power [2]; we might justify the association of an atmosphere with the place of the smart city by the common character of novelty of the two concepts; the study of architectural atmospheres is a relatively new field of interest that emerged as a reaction to a modernity dominated by geometry, technology and industrial standardization.
- **The patrimonial value** or the prediction towards a certain type of patrimonial value in the future; patrimonial value is no longer an uncertain and unfocused concept; it has been subjected to an evaluation system (such as the one proposed by Prof. Dr. Arch. Hanna Derer et alii) that generates a certain numerical quantification, by summing up the specific values of the various aspects related to patrimony. In our view this value should have two components, one with roots in the past, and one with expectations for the future. We propose to follow a criterion of aesthetic resilience in the design of new buildings.
- The **volume of data** generated, received and inferred together with the variation of this volume over time, a matrix characteristic of quantitative type, with its value dependent on its own factors: population fluctuation, temporal / historical evolution, state of operation of the system, physical or ethical availability for data transmission (use of LPWAN, Bluetooth, Lora WAN, LTE, NB IoT, Cat M and anticipated 5G technologies).

From the point of view of these three components, we can assimilate an intelligent place with the concept of Euclidean mathematical vector, with its four components respectively origin or tail, direction, head and magnitude. The concept of the smart city together with its areas of influence can be defined as a vector space for the existence of smart places.

1.2. The intelligent limit

Urbanization is a large-scale phenomenon with a permanent character; 54% of the world's population lives in urban areas, with chances that by 2050 this percentage will evolve to 66%. According to these calculations related to the growth

of the world's population, urbanization will add another 2.5 billion inhabitants of the cities in the next three decades [9]. These data force us to visualize the types of behavior of smart places, one in relation to another or in relation to the smart city, their vector space.

The defining element of the place as seen in the theory of architecture, is the limit, the boundary. "*Something is insofar as it has borders. The act of enclosing is the supreme ontological act. (...) The appearance of the border (...) is equivalent to the act of birth of the being. One thing is, absolutely, as long as it persists within its boundary, and it ceases to be with its disintegration"* [10]. We therefore justify the existence of the place-thing by the existence of the limits that separate it and identify it from other places. But how can we explain a limit to the *smart place*? It is not limited to the geographical place or its construction, but to an entire ephemeral and permeable virtual structure, through its ability to influence other places and other systems, or to influence itself, to self-generate. This structure is based on the head, direction and magnitude of the intelligent place. Influencing other intelligent places and influencing oneself, we find here the bases of visualizing a model that connects by inferential determinations, all intelligent places globally, recurrently, and based on technologically generated algorithms.

Through these characteristics, namely:

- A simple and recursive definition - cause-effect determination.
- Irregularity given by the atmospheric character but also by the wide range of influences in the system, from the minor ones (lighting of the street lighting according to the natural light intensity sensors) to the major ones (modeling the post-hazard administrative response).
- A fine structure at arbitrarily small scales, given by the capacity for self-regulation through subtle mechanisms (information transmitted - analysis - self-regulation) down to initial informational levels.
- It is stochastically similar.
- We assume the Hausdorff dimension to be larger than the topological dimension (we can predict the Hausdorff dimension to be similar with that of the Brownian motion, which tends to 2).

We find a starting point in beginning the research of the intelligent limit by applying fractal theory. Smart limits can be researched and understood as fractals.

1.3. Beyond place and limit

Architecture must be approached as a scientific discipline, because talking about architecture no longer means talking only about buildings, but about complex systems and processes within or between them. The high artistic side of architecture, which enhances its cultural value, overlaps a core dominated by the exact sciences, subject not only in a limited sense, but in an exhaustive one, to a way of thinking based on inference and experimental or theoretical demonstration. This artistic side has a lead role in defining architectural identity, which makes it for the scientific side of the approach what quantum theory is for the theory of relativity. The challenge resides in finding a unifying theory.

Its place and limit, as essential concepts of architecture, would be interesting to study with methods that belong to science, especially when seen through the prism of cybernetics and state-of-the-art technologies pioneered in the smart cities implementation.

The functioning of an *intelligent place* can be seen by analogy with that of a living organism: it generates data and information, even having the ability to synthesize them, while it can be experienced both physically and digitally; at the same time, it gathers information, it metabolizes the data and can self-regulate accordingly. We can not talk about reproductive capabilities, but an interesting phenomenon is observed, especially in recent months dominated by the effects of the pandemic: an intelligent place can be projected outside its physical boundaries, in countless replicas, and can be partially perceived or experienced visually, audibly and informational from any distance, through technological interfaces and with the help of the common will of the members of society. We can talk about places that already virtually circumscribe multiple other places, with a globalizing tendency of the *smart place*.

The role of *the intelligent limit* is even more interesting, somehow resulting from this virtual generalization of the place it brings into existence. Permeable or perhaps repressive, discretionary or imposed, *the intelligent limit*, by its fractal character, could in itself be an object of study. The phenomena of information exchange make it possible for the collected data to be used in any other intelligent places that depend on this data. We can adjust the level of street lighting according to sensors that measure the intensity of natural light, but the data provided by these light sensors can be used at the territorial level in conducting studies on the evolution of alternative energy systems, or global studies on the qualities of the atmosphere or the effects of climate change. These studies will return data to other smart place systems, or back to the first system, the original smart place. *The limits of the intelligent place* are, in the extreme, subject to disintegration, paradoxically, for the benefit of the smart place's prosperity.

The globalization of the intelligent place in parallel with the disintegration of the intelligent limit, here is a phenomenon bearing the potential of ideological anthropic hazard.

2. The atmosphere of the smart city

The visual seems to have supremacy in the perception of the architectural place, even if the origin of all the senses, including the visual, is biologically in the tactile sense. [14] At least that's what was said about the visual and tectonic aspects in recent architectural theory. But surprisingly, if we try to remember a place of our childhood, we will be surprised to discover that the evocation of that place contains very few visual details, and that it is characterized more by emotions, scents, textures, intuitions, cultures, of a way of presence in the world that we can comprehend in one word: the atmosphere of the place. This atmosphere is currently being researched, yet not enough theorized or quantified, but intuitively understood

by many as a New World that architects must conquer in order to create meaningful spaces.

We can take steps to understand it, even to anticipate it, when we study its relationship with the social, within the ecosystem of the smart city, as a smart atmosphere.

2.1. The identity of the smart place

Let's detail. The existential space of architecture, made up of patterns, centers, directions, roads and domains, is enriched with this genius loci. This existential space manifests itself phenomenologically on four concentric hierarchical levels: the geographical one, the urban one, the one of the dwelling (house) and the last one, of the work [5]. The next level, which we can place either before the geographical (meta geographic), or after the work (ueber - Ding), is the level of information, a kind of alpha and omega that transforms the former hierarchy into a circle. A circle that must have human life at its center, as said by architect Tina Saaby, who until 2019 held the position of chief architect of the city of Copenhagen. It stated in its presentation in 2013 that "*we must consider life before the urban space, and urban space before buildings.*" [18]

A place is such an existential space, defined by the limit of the corresponding space experienced over a time limit. A smart place is similarly delimited, and in addition digitally enhanced. The value of any place in architecture is given by identity, in the case of the smart place, this identity is both architectural and intelligent, the value of the place being a variable position in a Cartesian control field.

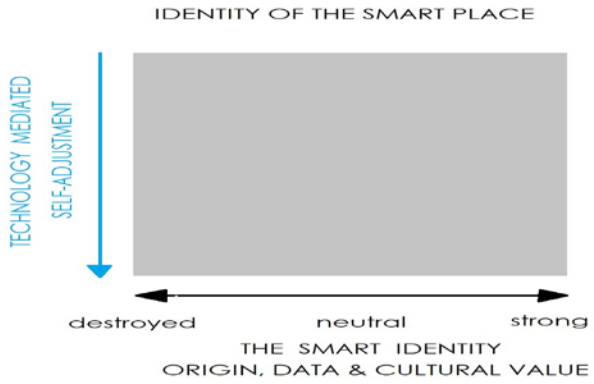

Fig. 1. The identity of the smart place

2.2. The relationship with the governance

Obviously, when the political power has in view democratic and sustainable urban development objectives, and should these objectives be pursued in an ethically way, the architectural identity of the place will be preserved or refined; the identity will not be reduced to the picturesque elements of heritage, but will be

extended to the new constructions that house functions endorsed by means of technology, resulting in a certain quality of the smart atmosphere of the place.

Ethical policies are those with a congruence between the values of society (prosperity, culture, quality of life, quality of environment and the transmitting of a range of traditions) and the values pursued or obtained through the control and self-regulation programs of the smart city. Ethical urban development policies will aim at preserving the identity of the place, in order to generate, in society, the feeling of belonging-together; another aspect of ethical policies is that they approach the place with its architectural identity, as a reference system for future generations, predicting and preparing the atmospheres of the future.

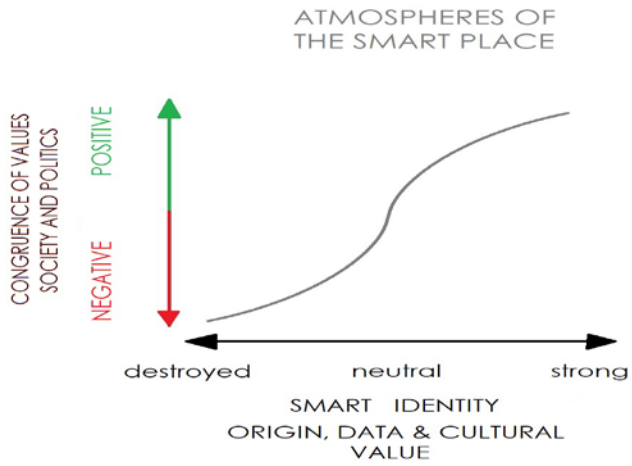

Fig. 2. The atmosphere of the smart place.

The architecture of the smart city must focus on the quality of these atmospheres and of urban life. [18] The mission is all the more complicated as beyond this quality desideratum, it superimposes on the design with distant future objectives, ensuring the flexibility in time of the architectural functions, together with the fulfillment of other special criteria such as the use of construction materials permeable to LPWAN or adapted to future data transmission technologies; these architectural functions already have and will develop over time their own technological infrastructure (for example we can assume that CAD design in BIM will create models of whole cities, in order to study their reactions to various internal and external factors) that will make accurate predictions of immediate or future needs, prediction based on ceded and inferred data.

But if we look at history, we see that governments, companies and individuals have placed great value on the information they hold, always treating third-party access to it with great caution. The exchange of information has an inestimable value in the existence of the smart city, and the concern for security threats and privacy can only erode this foundation on which the smart city is based: the identity of the

smart place. Is the increase in the exchange of information for the purpose of self-regulation a risk factor? This remains to the date an open question.

2.3. The saturated phenomenon and the smart city

In order to introduce the method of this investigation, we first propose to find, in the spirit of architectural theory, a phenomenological justification of the type of relationship between society and technological development.

Of course, when asked at one point, no one will oppose or see a danger in interpreting the data related to a specific place, as long as it is assumed that the goal is an improved quality of life. Sometimes even those data related to the individual privacy are transferred for collection to third parties without the owners intuiting the overall value of the models influenced by them. [9]

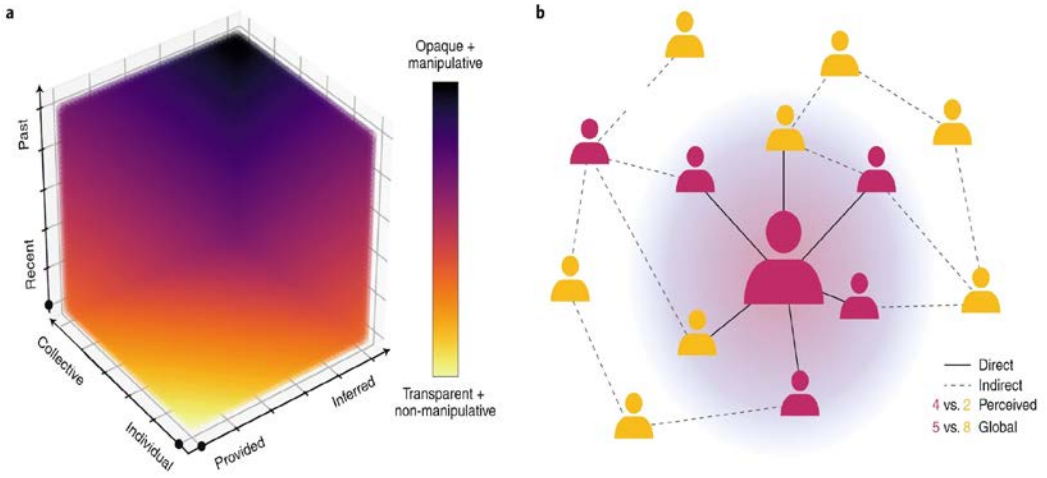

Fig. 3. „Challenges in technologically curated environments and on social media platforms. a. Dimensions of knowledge reached by information technology, which makes their recommendations opaque and manipulative. b. The size of the perceived group in relation to the real global dimension, from the point of view of the user (center) in a social homophile network"
Source: *https: //www.nature.com/articles/s41562-020-0889-7/figures/1*

The smart place will generate far more information exchanges than individuals taken separately. And, as with individual users, previous selections of self-regulation as a whole make the phenomenon of nudging possible. They make manipulation possible in the smart place.

The governance of the smart place can use these technologies for purposes that serve the community, or for manipulative purposes, at all levels of interest, local, regional, national, global. Or it may itself be the subject of this manipulation. "*There are at least three areas where these technology platforms go far beyond human cognitive abilities: data that refer to periods from the recent to the distant past, (for example, years of history of a physical place on Google Maps), information about*

human behavior at the collective level, compared to the individual level (for example, the analysis of the preferences of millions of Amazon customers that may be the basis for recommending a particular product or software) and knowledge gained through technology-specific deduction methods, based on existing data collected (for example, learning gastronomic preferences according to the pattern of travel related to the restaurants of a certain place). "[9] What if the local historical data interpreted were those related to political protests? Imagine them correlated with behavioral patterns given by Big Data. Can we witness the manipulation of decisions to accept certain technologies, certain smart places, in taking advantage of the dissipative approach to smart limits, in order to create unethical gaps?

A branch of philosophy concerned with donation (in the sense of giving) that has in the center the figure of Jean-Luc Marion, with a particular theory about a certain type of phenomenon called saturated, will provide us with the framework for the type of perception of technology we have in mind. By comparing it with the act of contemplating an art object, more precisely a painting signed by Mark Rothko, as a particular case suggested by Marion. A work of art looks at us with intensity, creating an exclusive and enslaving connection, capturing our full attention in such a way that nothing will escape the admiration seeking vortex, uniquely directed towards its essence. This is an essence that radiates so intensely that it melts the artist's personality and any resemblance to the immediate reality. The essence removes from the ambience any rival who would compete for attention, reaching "*such an intensity that often saturates the capacity of (...) sight, and even exceeds this capacity.*" [12] Marion calls this type of essence - the idol.

Fig. 4. Vladimir Rothko - Black Canvas at NGA 2010 - In the Tower
Source: *Courtesy of Author Matthew Langley*
https://i1.wp.com/www.matthewlangley.com/blog/uploaded_images/rothko_front-769229.jpg [9]

„Name your idol and you will know who you are. "[14, p.61] The theory of architecture with its recent phenomenological aura, gives us the chance to study intelligent places and their limits as a support area for the manifestation of the idol generated by this technology that exceeds by far our intellectual abilities. I would like to paraphrase a statement by the same Jean-Luc Marion, whose theory of donation and the saturated phenomenon we consider adaptable to the study of behaviors generated by technological domination. For intellectual pleasure, I replaced "art" with "technology", obtaining defining statements at the extreme limit for a new religion, the one that deifies technology. (The artist chosen by Marion in explaining his thinking, Mark Rothko, is also a visionary, we can formally assimilate the image of the painting with the appearance of a closed iPad. Fig.5)

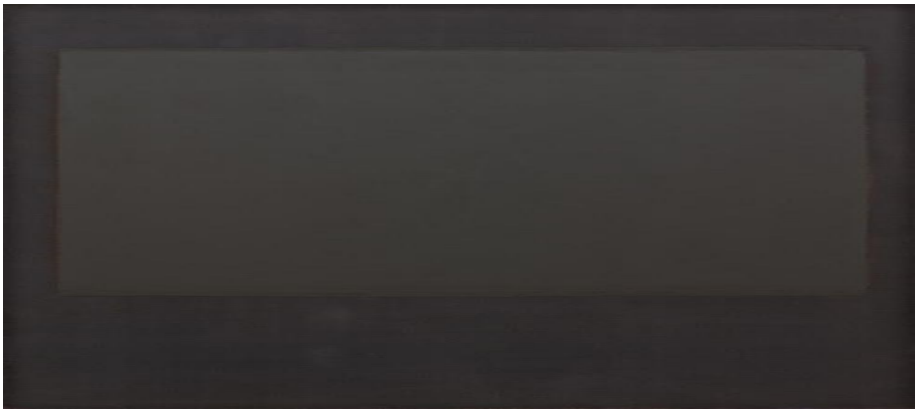

Fig. 5. No. 2, 1964, mixed media on canvas, 266.5 x 203.2 cm (105 x 80 in.),
Collection of Robert and Jane Meyerhoff,
Source: *www.nga.gov*

"*Raising information to the level of the original, in fact to nothing more and nothing less than the imperative origin of phenomenality, that is, the position and place of work in the world.*" [14, p.63-64], here is the premise of the saturated phenomenon related to the adoption, contemplation and blind pursuit of technology. "*In this way the idol is realized: the visible interface, which the eye cannot pierce and abandon, because it saturates it for the first time, capturing all the admiration*." [14, p.60]. Or really simply put: abundance of information will lead to sabotage of attention.

Contemplating technology and completely abandoning it takes the form of a saturated phenomenon. But how does this happen in the smart place? Is this idol benevolent or unpredictable? How does the worship happen?

2.4. The idol of the smart city

, "*Logic is a poor guide compared to custom.*" said Churchill in a famous speech back in 1943 [23]. The sentence was designed to convince the audience that the destroyed room of the House of Commons must be restored exactly to its previous

shape after being bombed during the war, not enlarged and transformed from an oblong plan to a more modern circular plan oriented towards a center of interest. Churchill was an advocate of a tradition based on a sine qua non habit of the human essence - direct (sometimes even verbal aggressive) confrontation - and on embracing diversity of opinion as the fundamental of democracy.

However, for the time being, pure logic seems to be the principle of the existence and development of technologies in relation to the intelligent place. The logical non-debatable inference, manifested in a fractal way, up to the fine lacework of the structure of human behavior. Where can this logic fail? Is there an existential space that will escape the control of logic and thus become unpredictable?

Catastrophe theory (TC) is a method of modeling the discontinuous phenomena of dynamical systems. It is the one that studies the sudden change of the defining essence of a system, in the conditions in which the applied forces have a fine and constant increase. A dam, for example, under constant increasing pressure, will retain its original shape until a certain moment when its conformation will be suddenly and completely changed when it breaks. A society that keeps its balance in difficult conditions until all the frustrations repressed by a revolution spill over. This mathematical theory also explains natural phenomena, such as the particular perception of the moon's twinkles on the waves of a lake at night, always in pairs of bright spots. [3]

When we apply continuous forces, we expect continuous effects. But when discontinuous phenomena occur, when they have an impressive magnitude or are devastating, we call them catastrophes, hence the disturbing name of catastrophe theory. [3] Discontinuous behavior of dynamical systems was started by mathematician Rene Thom, and the theory already has behavioral or ecological applications. We will model the dynamic system of intelligent atmospheres according to this theory.

3. The story of the two smart cities

We saw in section 2.2 how the atmosphere depends directly on preserving the identity of the place and the political ethics reflected upon society. In section 2.1. we identified a field of variation of the identity of the intelligent place, by coordinating characteristics related to the volume of information generated, collected and deduced (a volume of information exchange) with the architecture (site, cultural value, quality of life).

Catastrophe Theory (TC) has the quality of providing us with support for our intuition and describes, in a convincing way, how the concomitant meeting of certain conditions will generate a possible, quantifiable and predictable bifurcation of social behavior. In the complex context of the smart city, the future of collaboration between technology and society is of interest, this collaboration can take several forms: rejection (from moderate to vehement or revolutionary), harmony, manipulation. The word collaboration is used to emphasize the significance of personifying technology in context, alluding to the latest research related to AI).

This mathematical theory helps us to analyze how allowing the increase of control exercised by technology (this indisputable idol (even mediated by socially

sustained political moderation) can affect the evolution of smart city atmospheres, by creating conditions for jumping (negative or positive) in the degree of social acceptance of this control.

The identity of a smart place (city) can vary freely between two opposite boundaries. We assimilate the positive value with a strong identity, sustained over time by the continuity of collective memory, a real cultural importance and the authenticity and multitude of data in local and foreign exchanges. These cumulative characteristics can be visualized in the form of a three-dimensional urban mandala, the three dimensions being geography, culture and information. The negative value is given by the dismantling of the feeling of belonging, by the loss or destruction of cultural values and by the nonexistence or lack of credibility correlated with the manipulative intentions of the information exchange. Between these two extremes, identity passes through a value range of the *no man's land* type which in our conception does not constitute a minimum of identity, but a neutrality specific to new places artificially implanted or born from tradition but inorganically rehabilitated, without authentic cultural landmarks or that can be appropriated in time, governed and administered by scientific methods and technology.

The stronger the place has an identity, the higher the degree of coordination of social aspirations with the ethics of local policies. The more the identity of the intelligent place is lost even to the point of annulment, the more frustratedly the place will be dwelled (in the sense of experienced), the more rejected and left to decay it will be (disintegration, depopulation, crime) through unethical policies.

We will add a new variable, in this dynamic ensemble, namely the growth of self-controlling capacity of the technological system, the degree to which the regulation of the urban system is ceded to it, and, at the same time, the number of freedoms given up in order to fulfill an atmosphere of perfect harmony and functioning, which is the goal of any administration.

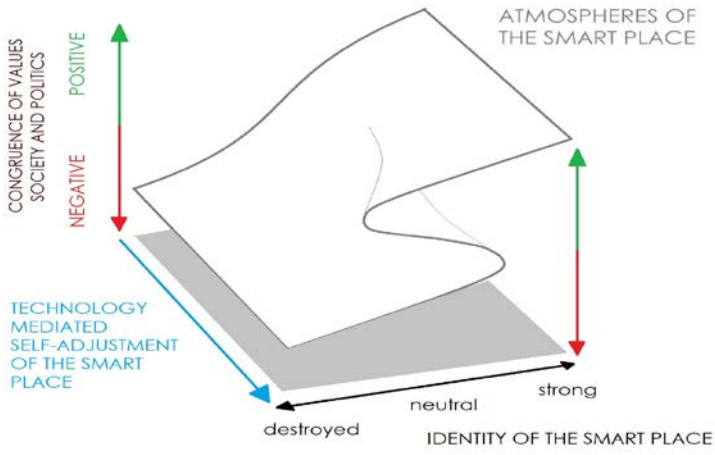

Fig. 6. Possible behaviors in the intelligent atmospheres.

We view this control as a continuously increasing, fine force, which in the mathematical theory of TC catastrophe is a factor that at some point will generate a bifurcation, in the sense that as self-regulation through technology increases in scope, the more it influences much the atmosphere of the intelligent place, the social acceptance of the paradigm is a binom of possible values: either/or. The variation of the three types of values, two control and one generating the bifurcation, will result graphically in a surface with double curvature, a three-dimensional surface of solutions, with a special folding characteristic, called "the cusp".

We interpret that from a certain value of technologically mediated control, the value of social acceptance of policies related to the smart place is no longer singular, but is found on two levels, one in the positive space of the three-dimensional graph, one in the negative space. The area of values between the two levels is in TC so unlikely to be reached that we consider it negligible. For more clarity, the graph above represents the range of variations in the atmosphere of the intelligent place, corresponding to the social response to the fine increment of technological self-control.

For a point characterized by an identity in the neutral zone, with a strong technologically mediated control vector and a state of social equilibrium, this equilibrium will be sharply disturbed, after a certain limit of ceding autonomy in favor of technology: the equilibrium will become so unlikely that it is negligible, the state of congruence between social and politico-administrative values will be able to jump between two states of grace both subject to anthropic risk: one of the two possible smart cities.

The bifurcation has as causes a mathematical behavioral model, but also a philosophical model with roots in the saturated phenomenon presented above. The technological idol, paved with intuitive software and infinite inferences, fed with direct information but also with predictions generated by this software; he is adored and immediately captures the attention on the control area with predictable conditions of behavior, generating a stable and appropriate atmosphere.

This control area is shown again in figure 7, which represents the design of the graphic surface given by the variation of the atmospheres, in terms of the identity of the intelligent place. The surface marked in gray represents the projection of the repertoire of atmospheres that generate the stability and congruence of values between political and social. It is the surface with conditions of acceptance of living, of living space in a given form (in Marion's sense). On this surface is identified a shaded area as a projection of the atmospheres in which the behavior can turn from positive to negative and vice versa - a "cusp" of values. By quantification, TC can give us a limit value of the technological self-regulation from which this discontinuous behavior will manifest itself, and a cumulation of conditions that will generate the discontinuity, this intervening irrationally and unexpectedly.

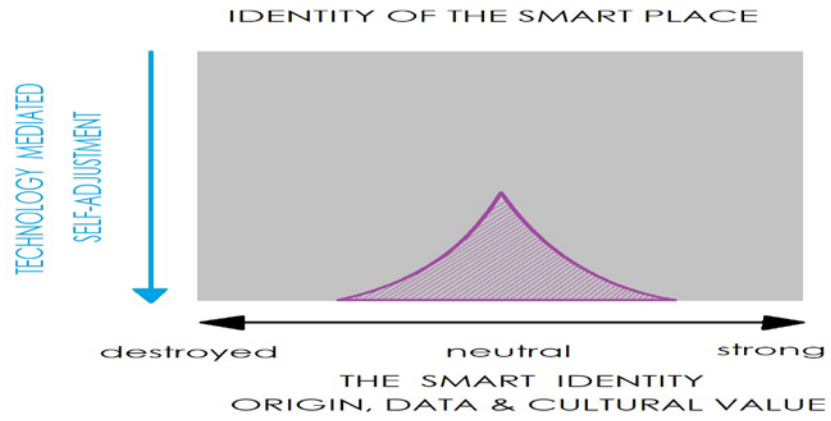

Fig. 7. The cusp projected on the identity of the smart place

We interpret that, applying TC, we will identify certain types of smart places that will be socially rejected or will generate dissatisfaction to serious dissensions with the governance, namely those characterized by the nullity of identity combined with a constantly increasing technological control. These particular places evade the domination of the technological idol, and create the conditions for a story with a difficult ending.

In the absence of the saturated phenomenon generated by technology, this expression of intelligence and human spirit that curls and provokes divinity, society can manifest its free will, through a revelation that is not divine in nature, but is based on the values of humanity. The demolition of the idol puts in front of the society of the smart city two options, a fork in the road, just equally possible.

The atmosphere can be corrected for the negative value of social acceptance, and then we will witness phenomena corresponding to an anthropological hazard of an ideological type of greater or lesser magnitude, until the total uninstallation of technological control or complete depopulation of the smart city. A smart city stormed by revolution. Or it can move towards a highly positive value of social acceptance, which superimposed on the nullity of the identity of the place and the progressive establishment of technological control, will create the conditions of anthropogenic ideological hazard through social manipulation of the purest dystopian story. These discontinuous behaviors are the two faces of a smart city headed to a grim scenario of failure.

Pushing the limit, we will continue the cusp graph of the TC, with the observation that this duality is maintained on a diamond-shaped surface, which looks at us provocatively from the center of the idol dominated kingdom of values. [3] It is suggested to us by mathematical theory that the field of bifurcation is limited, once a certain threshold of ceding control to technology is exceeded, the atmospheres stabilize, perhaps by reaching a new level of social consciousness that embraces technology as a new form of existence, a new given. This new stage of civilization can be seen as a migration of the concept of smart city to the concept of

smart me, involving at some point the neurological sciences in the process of self-regulation of the urban ecosystem. The other ever resilient smart city.

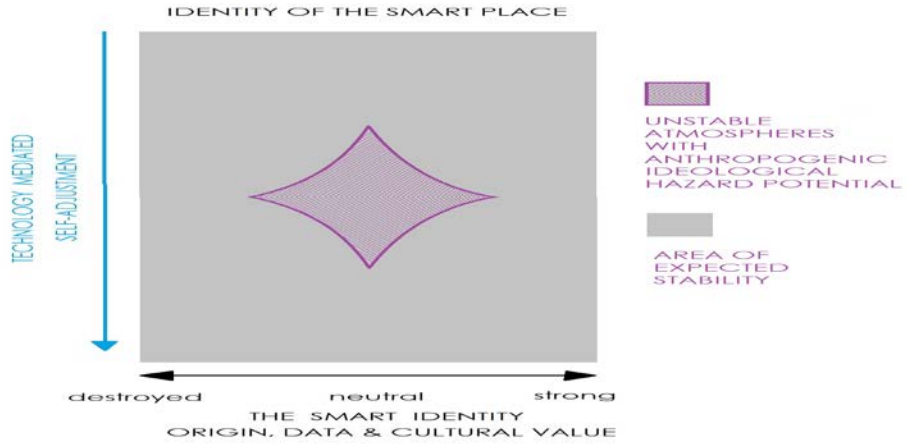

Fig. 8. The area corresponding to the cusp to the continuous increase of the technological control

These are the two possible smart cities in the title with their story. The first idea of representing these variants started from the Dickensian narrative which is the best-selling book of all time. Especially from the famous opening paragraph (please see our *Post Scriptum*). But more recently, a steampunk story written by the terrible child of contemporary fantasy literature, Neil Gaiman, playfully opened the same perspective on the coexistence of two possible cities, with opposing views on the technological idol, denying each other (*Neverwhere*, 2008).

Behavior prediction will be verified as smart cities become more and more impressive in their performance. We can already find examples where predictions can be tested, but we are still at the beginning of their implementation. An example is Songdo, the first smart city in South Korea, and the world's largest, built with the help of IT company Cisco [13] at a relatively short distance from Seoul, only 60 kilometers, an hour and a half drive for the inhabitants attracted by the novelty of the ambitious project. Launched in 2003 and implemented in 2015 on an area of 600 hectares recovered from the Yellow Sea. Designed as a major economic center helped by an attractive luxury residential area in terms of prices that offer a quality of life that becomes a standard to be achieved and a model to follow. And yet the press declares it "an impersonal project" which "is not a great success." [13] The project consists of volumes of metal and glass, gathered around a 305-meter-high landmark, North East Asia Tower, and does not contain museums or cinemas. It is populated only halfway to expectations, the inhabitants being attracted by the novelty of the project and the facilities offered: generous green spaces, 25-kilometer bicycle route, a quality educational offer, but the employees of the (only) 58 companies based in Songdo say they can't live there. The city is impressively developed technologically, there are 500 surveillance video cameras in constant contact with the police, there is internet everywhere and an IoT innovation project

is under development. Electricity networks operate according to an efficiency program, there are garbage collection systems that achieve a recycling rate of 76%. And yet, what is the cause of the lack of attachment of employees and residents of Songdo? On the graph above, the point corresponding to the atmosphere of the projected place is in the range of dual ones, and because the technological control is not forced (although we can say that the city is under continuous surveillance) the reaction is not very violent. Songdo's identity as a smart place tends towards values of neutrality, due to the complete neglect of arranging and offering the stage for a complex social life, making Songdo a "ghetto for the rich" [13], as Le Monde calls it.

Fig. 9. The Tale of Two Smart Cities - a possible skyline.

4. Conclusions

" What I look at that is visible decides who I am. I am what I can look at. What I admire judges me." - Jean-Luc Marion [12]

Our application is a starting point for a possible investigation of the potential of future projects, in complex feasibility studies. This is a demonstration of a possible end of smart cities, looking defiantly at us from the eye of this tornado of artificial intelligence development. At the same time, it is a plea in favor of the contemporary current of architecture, with as avant-garde supporters Peter Zumthor and Juhani Pallasmaa, a new approach to living space with the contribution of all the senses, overcoming the absolute supremacy of sight, and putting in a new light intuition that gathers its subtle and subliminal information from all sources of sensory reception: hearing, smell, haptic interaction, atmosphere of places. This atmosphere, intelligent or not, is what gives the strength and resilience of the smart place, it is that quality that an individual or a team can evaluate instantly, without even distinguishing all the constructive or visual details of this place. The intuition of the local atmosphere is probably related to the evolution of our species, to the survival instinct put in front of an opponent endowed with the same weapon of intelligence, the other man. This intuition can also be manipulated, but this is the subject of another discussion.

In the absence of an awareness of the importance of the identity of the place, in the absence of concerns related to the evaluation, conservation and prediction of this identity which has an organic nature thus being mortal but can reproduce

indefinitely through rehabilitation, conservation, restoration and instating as a sine qua non condition of sustainable development, we will witness surprising phenomena, such as the Songdo phenomenon, or its predecessor, the phenomenon Pruitt-Igoe. In the latter case, the idol was not, in our opinion, technology, but modernity-at-all-price, another side of the vanity of our civilization, which is beginning to understand the true meaning of that the perception of space and our mental maps find their place in the brain in hippocampi, the longest tested formation, which is part of the system pejoratively called to this day "reptilian complex" [11]. We will be able to anticipate the future of the city regulated by technology after we understand more clearly the connections between the specific neurons representing the space, intuition and the atmosphere of the place. Until then, we must be aware of a possible anthropogenic hazard due to an ideology related to the indiscriminate implementation of technology on a large scale, with its two extreme disaster models.

In anticipation of the losses caused by this type of risk for the development of smart cities, we see as a solution the creation of strategies to remove smart cities from the neutral zone of architectural identity, to promote the aesthetic-atmospheric resilience of architectural projects, and to research and define methods by that intelligent places can be or become "palaces for humanity" [20].

It is this mathematical application equally an exhortation to balance, because it confirms our intuition that this idol of technology can be worshiped, but not in a monotheistic cult, but in a phenomenological construction of polytheism, in which to dialogue with other idols, as well; idols just as imperfect but just as strong, such as tradition or beauty (created by mathematics, art, or nature). This tragic and fruitful confrontation between two or more idols is the basis of the morphogenesis of the authentic and living atmosphere we will feel flooding a world, that world which is born of the great work researched by Heidegger, or which is given by the painting of genius described by Marion. A possible world of this rank is that of the smart city of a humanitarian future.

Fig. 10. A corner of Mark Rhotko's exhibition at NGA
Source: *http://matthewlangley.com/blog/?p=6*

Post Scriptum: "It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us, we were all going direct to Heaven, we were all going direct the other way – in short, the period was so far like the present period, that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree of comparison only."[3]

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Povestea a doua orașe inteligente

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Abstract

Ante Scriptum: Orice salt de dezvoltare sau revoluție în istoria civilizației umane a avut ca preambul o perioadă de căutări și confruntări teoretice, care au fost catalizatoarele respectivelor shift-uri în paradigma istorică. Teoretizarea are rostul ei, și se dorește prin lucrarea de față a se deschide drumul unei adaptări a teoriei de arhitectură la noile concepte legate de modelul smart city. Deasemenea, investigăm predictibilitatea destinului organismului smart city și posibilele direcții de morfogeneză.

Studiul are la bază revizitarea conceptelor de loc și limită cu noi conotații dezvoltate de tehnologia care are un rol de mediere vizavi de individ și comunități. Prin redefinirea lor, conceptele capătă caracteristici de variabile sau funcții matematice, care pot studia sau genera eficient modele de comportament viitor ale orașelor inteligente, aceste entități teritoriale duale, cu corp și, iată, o inteligență artificială IA (IoT, aplicații, cloud, softuri). Unul dintre aceste modele este teoria catastrofei, care poate prevedea limitele acceptării saturării fenomenologice (în sensul filosofic al lui Jean-luc Marion) de către individ, sau în extremis, de către societate. Vom descrie modul în care poate fi aplicată teoria catastrofei utilizând noțiuni de teoria arhitecturii cuantificate, și modul în care sistemul filozofic al donației descris de Marion poate ajuta la trasarea limitelor existenței orașului inteligent.

Abordarea este de tip teoretic folosind inferența, observația și exemplificarea prin studii de caz. Metodele de cercetare pot fi doar de natură eclectică și interdisciplinară, care să lege teoriile atmosferelor arhitecturale, ale donației din filozofia fenomenologică și ale matematicii aplicate. Metoda traducerii în variabile cuantificabile a valorilor de loc și limită, are la bază încărcarea noțiunii de loc a lui Christian Norberg-Schulz, cu valențe conectate la specificitatea dată de medierea tehnologiei între individ și loc.

Rezultatele sunt modele de comportament de natură bivalentă, filosofico matematică, pentru a descrie o nouă teorie a arhitecturii, o teorie a locului inteligent. Acest tip de loc architectural cu setul lui de parametri, este un element nou de studiu, în continuarea cercetărilor din domeniul arhitecturii având ca obiectiv diminuarea riscului și prevenirea pierderilor

la hazardurile ce amenință acest oraș inteligent, fie ele antropice sau naturale.

***Cuvinte cheie**: loc inteligent, limita inteligenta, fenomen saturat, teoria catastrofei, atmosferă inteligentă.*

1. Despre locuri

O nouă asociere de forţe între teoria arhitecturii, cu abordarea ei preponderent fenomenologică, şi studiul dezvoltării oraşelor inteligente cu problematica oscilând între performanţă şi etică, este de natură să creeze un nou spațiu de cercetare, acela al locului inteligent şi al limitei sale, cu o metodologie duală, umanistică şi matematică.

Teoria arhitecturii ne oferă câteva exemple celebre de definire a locului, venite din domenii de interes variate. La prima vedere cuvântul ,,loc" pare uşor de înţeles şi este frecvent utilizat, făcând parte din fondul principal de cuvinte al limbii române, având etimologie clară din limba latină, respectiv ,,locus-loci"[1]. Prima definiție din DEX ne apare fără echivoc: un loc este un punct sau o porțiune determinată în spațiu. Iată originile căutărilor de sens: o primă întrebare critică se naște și anume ,, determinată de cine, în ce fel, pentru cine?". O alta întrebare, mai provocatoare: ,,care spațiu?". Aventura hermeneutică începe de aici, pentru că locul şi spațiul sunt concepte de bază ale arhitecturii.

Un exercițiu simplu ar fi să încercăm să oferim acestui cuvânt atât de familiar câteva definiţii de echivalenţă: locul este un spațiu delimitat fizic şi teoretic; locul este o suprafață unic identificabilă; locul este o unitate de măsură a percepției în arhitectură. Cu cât ne apropiem de esența definiției lui, introducem concepte noi care ne îndepărtează şi mai mult de aceasta, într-un tipar de ,,strange loop" [7]. Dacă ar fi să alegem o definiție poetică, locul ar putea fi văzut în maniera literatului american Robert Pogue Harrison, în tradiția aceleiaşi bucle stranii. ,,*În fuziunea dintre loc și suflet,sufletul este un recipient al locului în aceeași măsură în care locul este un recipient al sufletului*" [4]. Putem oare găsi definiții mulţumitoare pentru acest concept? Ca orice concept, ne scapă, şi tot ce putem prinde, ca o caracteristică descriptibila a lucrului-loc, este identitatea lui; dacă suntem dispuşi să legăm conceptele de identitate şi de loc, îl găsim pe primul la Heidegger asimilat cu noțiunea de ,,a-aparține-împreună" [6] iar pe al doilea extins la idea mai largă de topologie, de către acelaşi gânditor. Rămânem astfel prizonierii unui cerc hermeneutic.

În scopul împrietenirii cu acest ,,loc" abstract, putem să ni-l apropiem sau să ni-l apropriem împodobindu-l cu limite. Poate părea deplasată afirmația anterioară, dar aşa cum nu putem descrie o persoană necunoscută decât prin atribute care îi limitează gradul de ambiguitate pentru un terț, la fel ne putem nouă înşine defini un loc fixându-l între limitele lui. Putem explica limite spațiale (cartierul, parcul), limite culturale (zone încărcate cu o tradiție unificatoare), limite exhaustive (coordinate de natura longitudinii şi latitudinii care să definească o poziție geografică exactă) sau atmosfere (locuri evenimentelor stradale, ale ocultului, ale divinizării). Tot un fel de

limită este și conceptul lui Christian Norberg-Schulz, atât de cunoscut lumii teoreticienilor de arhitectură, *genius loci*. La origine, un termen latin care se traduce ca un spirit al spațiilor locuite și deservite activităților omului, fiind o entitate supranaturală adorată în religia romană: „*nullus locus sine Genio*" (*Vergilii Aeneidos Commentarius*) . Teoreticianul norvegian redefineste nostalgic acest *genius loci* pentru teoria arhitecturii. Un concept foarte adaptabil entităților cu caracter cultural, care își extrage seva elocvenței din tradiție și care este invocat pentru justificarea și imaginarea atmosferelor arhitecturale, ajutând la identificarea unui loc față de altul, limitându-l deci, dar păstrându-și însă caracterul efemer și imaterial [15]: „*Architecture means to visualize the genius loci, and the task of the architect is to create meaningful places, whereby he helps man to dwell."* [16]

Iată cum am reușit să evidențiem o simbioză între loc și limită, în care primul are rolul de a introduce limita în spațiu pentru ca spațiul să poată fi apropriat, trăit prin *Ereignis* ; „*Un spațiu este ceva rânduit, cedat, eliberat, și anume în vederea unei limite, în greacă peras…Spațiul este, prin esența sa , ceea ce este rânduit, ceea ce este introdus în limita sa."* [5] Felul în care această apropriere se întâmplă ca fenomen este în arhitectură prin edificare. Vedem edificarea ca mai mult decât simpla construire, și anume prin construirea augmentată de reprezentare. Putem chiar vedea o soluție la interesantă problema apariției arhitecturii astfel: arhitectura a apărut odată cu construirea cu intenția de reprezentare. (Putem astfel încadra curajos peștera din Lascaux în domeniul arhitecturii argumentând caracterul ei de reprezentare, de edificare prin artă, și putem exclude construcții curajoase ca Emley Moor Tower pentru lipsa caracterului de reprezentare).

1.1. Locul inteligent

Vedem că locul nu este o noțiune consumată sau neglijabilă în domeniul arhitecturii sau urbanismului, prin urmare trebuie să fie de interes și în legătură cu studiul orașului inteligent. La urma urmei, orașul inteligent are la bază o structură materială dominată de legile arhitecturii și ingineriei construcțiilor, peste care se suprapun sistemele complexe și interdependente ale vieții urbane: transporturi, infrastructuri, administrație, educație, sănătate, activități recreative, reprezentând sistemul nervos vegetativ al organismului urban. Orașul inteligent are o nouă aptitudine, pe care o putem asimila cu un sistem nervos central propriu. Este vorba de capacitatea de sintetizare a unor mari volume de date culese de la surse variate cu ajutorul unor tehnologii avansate (IoT, aplicații, sisteme de senzori, sisteme de camere video), prin prelucrarea lor, în scopul de generare de soluții și de adaptare în timp real a funcțiilor urbane. Sunt întrunite premisele definirii unui concept de *loc inteligent*, care să unească domeniul de interes al locului ca și concept de lucru esențial al arhitecturii, cu baza de date generate de el în timp real și cu efectele analizei acestei cantități de date, respectiv capacitatea de autoreglare.

Un astfel de loc inteligent are trei caracteristici principale:

- **Originea arhitecturală**, adică amplasamentul geografic și ansamblul edificat (cu infrastructură fizică necesară funcțiilor lor) dominat de unul sau mai multe repere cu caracter definitoriu (iată un exemplu: Piața Victoriei, cu reperul său iconic Palatul Victoria al arhitectului Duiliu Marcu-1937);

- **Atmosfera arhitecturală** care îi dă *sens*, acest sens putând fi unul de atracţie sau de respingere cu toate gradele intermediare, inclusiv cel de indiferenţă, în funcţie de percepţia individuala sau de opinia publică la un anumit moment; aceasta evaluare intuitivă a atmosferei locului a fost legată atât de percepţia periferică [16] cât şi având în vedere relaţia cu puterea politică [2]; justificăm asocierea unei atmosfere cu locul oraşului inteligent prin caracterul comun, de noutate al celor două concepte; studiul atmosferelor arhitecturale este un domeniu de interes relativ nou apărut ca o reacţie la o modernitate dominată de geometrie, tehnologie şi standardizare industrială.
- **Valoarea patrimonială** sau predicţia către un anumit tip de valoare patrimonială în viitor; valoarea patrimonială nu mai este un concept incert şi nefocusat, el a fost supus unui sistem de evaluare (arh. Hanna Derer et alii) care generează o anumită cuantificare numerică, prin însumarea valorilor specifice ale variatelor aspecte ce ţin de patrimoniu. Această valoare are două componente, una cu rădăcini în trecut, şi una cu aşteptări legate de viitor. Propunem urmărirea unui criteriu de rezilienţă estetică în proiectarea clădirilor noi.
- **Volumul de date** generate, primite şi inferate împreună cu variaţia acestui volum în timp, o caracteristică matriceală de tip cantitativ, cu valoarea ei dependentă de factori proprii: fluctuaţia populaţiei, evoluţia temporala/ istorică, starea de funcţionare a sistemului, disponibilitatea fizică sau etică pentru transmiterea datelor (utilizarea de tehnologii LPWAN, LTE, Cat M, NB Iot, LoRaWAN, Bluetooth, si anticipatele tehnologii 5G).

Din punctul de vedere al acestor trei componente, putem asimila un loc intelligent cu conceptul de vector matematic Euclidean, cu cele patru componente ale lui respectiv origine, sens, direcţie şi modul. Conceptul oraşului inteligent împreună cu zonele lui de influenţă se poate defini ca un spaţiu vectorial de existenţă a locurilor inteligente.

1.2. Limita inteligentă

Urbanizarea este un fenomen de anvergură cu caracter permanent; 54% din populaţia lumii locuieşte în mediu urban, cu şanse ca până în 2050 acest procent să evolueze către 66%. Conform acestor calcule corelate cu creşterea populaţiei globului, urbanizarea va mai adăuga încă 2.5 miliarde de locuitori ai oraşelor în următoarele trei decenii [9]. Aceste date ne obligă să vizualizăm tipurile de comportament a locurilor inteligente, unul în raport cu altul sau în raport cu oraşul inteligent, spaţiul lor vectorial.

Elementul definitoriu al locului aşa cum este văzut în teoria arhitecturii, este limita, hotarul. „*Ceva este în măsura în care are hotare. Actul hotărârii este actul ontologic suprem.(…)Apariţia hotarului (…) echivalează cu actul de naştere al fiinţei. Un lucru este, în mod absolut, câtă vreme persistă în hotarul lui, şi el încetează să fie odată cu destrămarea acestuia*" [10]. Justificăm deci existenţa lucrului-loc prin existenţa limitelor care îl separă şi îl identifică faţă de alte locuri. Cum oare însă

putem explica o limită pentru locul intelligent? Acesta nu se rezumă la locul geografic sau edificarea lui, ci la o întreagă structură virtuală efemeră şi permeabilă, prin capacitatea sa de a influenţa alte locuri şi alte sisteme, sau de a se autoinfluenţa, a se autogenera. Această structură se întemeiază pe sensul, direcţia şi modulul locului inteligent. Influenţând alte locuri inteligente şi influenţându-se pe sine, găsim aici bazele vizualizării unui model care leagă prin determinări de tip inferenţial, toate locurile inteligente la nivel global, în mod recurent, şi în baza unor algoritmi generaţi tehnologic.

Prin aceste caracteristici şi anume:

- O definiţie simplă şi recursivă – determinarea de tip cauză-efect.
- Neregularitatea dată de caracterul atmosferic dar şi de gama largă de influenţe în sistem, de la cele minore (aprinderea iluminatului stradal în funcţie de senzorii de intensitate a luminii naturale) până la cele majore (modelarea răspunsului administrativ post hazard).
- O structură fină la scări arbitrar de mici, dată de capacitatea de autoreglare prin mecanisme subtile (informaţie transmisă - analiză - autoreglare) pâna la niveluri informaţionale de incepţie.
- Este autosimilară în mod stochastic.
- Presupunem dimensiunea Hausdorff mai mare decât dimensiunea topologică (putem asimila dimensiunea Hausdorff cu cea a mişcării Browniene, care tinde către 2).

Găsim un punct de pornire în începerea cercetării limitei inteligente prin aplicarea teoriei fractalilor. Limitele inteligente pot fi cercetate şi înţelese ca fractali.

1.3. Mai departe de loc şi limită

Arhitectura trebuie să fie abordată ca o disciplină ştiinţifică, pentru că a vorbi despre arhitectură nu mai înseamnă demult a vorbi doar despre clădiri, ci despre sisteme complexe şi procesele din cadrul lor sau între ele. Latură artistică înaltă a arhitecturii, care îi potenţează valoarea culturală, se suprapune peste un miez dominat de ştiinţele exacte, supus nu doar în sens limitat, ci complet, unui mod de gândire având la bază inferenţa şi demonstraţia experimentală sau teoretică. Această latură artistică are un rol definitoriu în definirea identităţii arhitecturale, fapt care o face să fie pentru latura ştiinţifică a abordării ceea ce teoria cuantică este pentru teoria relativităţii. Provocarea va rămâne în găsirea unei teorii unificatoare.

Locul şi limita lui, ca şi concepte esentiale ale arhitecturii, ar fi interesant de studiat cu metode care aparţin ştiinţei, cu atât mai mult când sunt văzute prin prisma ciberneticii şi a tehnologiilor de ultimă generaţie.

Funcţionarea unui *loc inteligent* poate fi văzută prin analogie cu cea a unui organism viu: el generează date şi informaţii, având chiar capacităţi de sintetizare a acestora, el poate fi experimentat atât fizic, cât şi digital; concomitent, el adună informaţiile metabolizează şi se poate autoregla în funcţie de ele. Nu putem vorbi de capacităţi de reproducere, dar un fenomen interesant se observă, mai ales în ultimele luni dominate de efectele pandemiei: un loc inteligent se poate proiecta în afara graniţelor lui fizice, în nenumărate replici, şi poate fi perceput sau

experimentat vizual, auditiv şi informaţional de la orice distanţă, prin intermediul interfeţelor tehnologice şi cu ajutorul voinţei comune a membrilor societăţii. Putem vorbi de locuri care circumscriu virtual deja multiple alte locuri, cu tendinţă la limită de globalizare a *locului inteligent*.

Rolul *limitei inteligente* este şi mai interesant, cumva rezultat din aceasta generalizare virtuală a locului pe care îl aduce în existenţă. Permeabilă sau poate represivă, discreţionară sau impusă, *limita inteligentă*, prin caracterul ei fractal, ar putea fi în sine un obiect de studiu. Fenomenele de schimb informaţional fac ca datele colectate să poată fi folosite în orice alte locuri inteligente care depind de aceste date. Putem regla nivelul iluminatului stradal în funcţie de senzori de măsurare a intensităţii luminii naturale, dar datele furnizate de aceşti senzori de lumină pot fi utilizaţi la nivel teritorial în efectuarea de studii de evoluţie a eficienţei sistemelor de energie alternativă, sau de studii globale referitoare la calităţile atmosferei sau la efectele schimbărilor climatice. Aceste studii vor întoarce date în alte sisteme de locuri inteligente, sau înapoi în sistemul de bază, locul inteligent iniţial. *Limitele locului inteligent* sunt, la extremă, supuse unei destrămări, în mod paradoxal, în beneficiul prosperităţii acestuia.

Globalizarea locului inteligent în paralel cu destrămarea limitei inteligente, iată un fenomen cu potenţial de hazard antropic de tip ideologic.

2. Atmosfera oraşului inteligent

Vizualul pare că deţine supremaţia în percepţia asupra locului arhitectural, chiar dacă originea tuturor simţurilor, inclusiv cel vizual, se află biologic în simţul tactil.[14] Cel puţin asta se susţinea despre vizual şi tectonic în teoria recentă a arhitecturii. Doar că în mod surprinzător, dacă încercăm să ne amintim un loc al copilăriei, vom avea surpriza să descoperim că evocarea acelui loc cuprinde foarte puţine detalii vizuale, şi că e caracterizat mai mult de emoţii, de parfumuri, de texturi, de intuiţii, de culturi, de un fel de a fi a lumii pe care îl putem cuprinde într-un singur cuvânt: atmosfera locului. Despre acestă atmosferă se fac cercetări în prezent, ea nefiind suficient teoretizată sau cuantificată, dar fiind intuită de mulţi ca fiind o Lume Nouă pe care arhitecţii trebuie să o cucerească pentru a putea crea spaţii semnificative.

Putem face paşi spre înţelegerea ei, chiar spre anticiparea ei, atunci când o studiem relaţia ei cu socialul, în cadrul ecosistemului oraşului inteligent, ca atmosferă inteligentă.

2.1. Identitatea locului inteligent

Să detaliem. Spaţiul existenţial al arhitecturii, alcătuit din scheme, centre, direcţii, drumuri şi domenii, se îmbogăţeşte cu acest genius loci. Acest spaţiu existenţial se manifestă fenomenologic pe patru niveluri ierarhice concentrice: cel geografic, cel urban, cel al locuirii (casa) şi ultimul, al lucrului [5]. Următorul nivel, pe care îl putem plasa fie înainte de cel geografic (meta geografic), sau după cel al lucrului (ueber - Ding), este nivelul informaţiei, un fel de alfa şi omega care transformă ierarhia în cerc. Un cerc care trebuie să aibă în centru viaţa umană, aşa

cum spunea arh. Tina Saaby, care până în 2019 a ocupat poziția de arhitect-șef al orașului Copenhaga. Aceasta a declarat în prezentarea acestuia în 2013 că „primează viața față de spațiul urban, și spațiul urban față de clădiri.”[18]

Un loc este un spațiu existențial, definit de limita acestui spațiu parcurs în timp. Un loc inteligent este delimitat asemănător, și în plus augmentat informațional. Valoarea oricărui loc în arhitectură este dată de identitate, în cazul locului inteligent, această identitate este atât arhitecturală cât și digitală, valoarea locului fiind o variabilă într-un câmp de control cartezian.

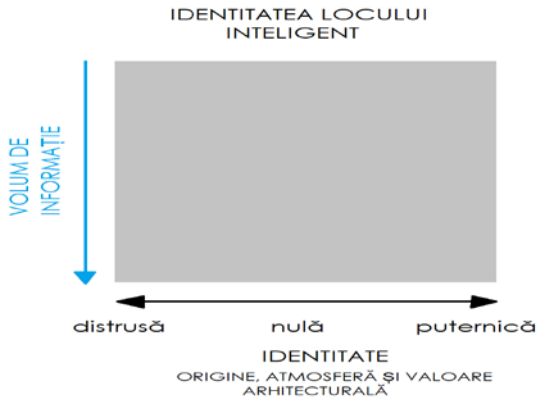

Fig.1. Identitatea locului inteligent

2.2. Raportul cu puterea politică

Evident, când puterea politică are în vedere obiective democratice și de dezvoltare urbană durabilă, iar aceste obiective sunt urmărite în mod etic, identitatea arhitecturală a locului va fi păstrată sau rafinată; identitatea nu va fi rezumată la pitoreștile elemente de patrimoniu, ci va fi extinsă la noile construcții care adăpostesc funcțiuni reglate de tehnologie, rezultând o anumită calitate a atmosferei inteligente a locului.

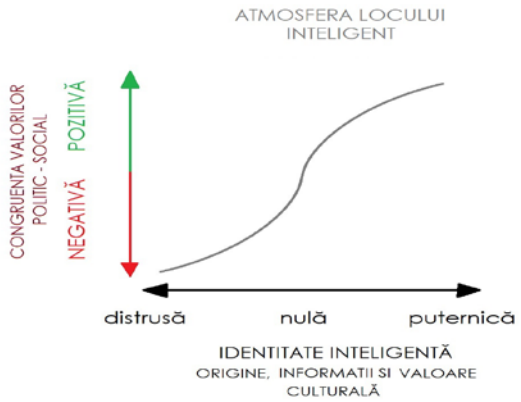

Fig. 2. Atmosfera locului inteligent

Politicile etice sunt acelea cu o congruenţă între valorile societăţii (prosperitate, cultură, calitatea vieţii, calitatea mediului şi evantaiul de valori tradiţionale) şi valorile urmărite sau obţinute de programele de control şi autoreglare ale oraşului inteligent. Politicile etice de dezvoltare urbană vor urmări conservarea identităţii locului, în scopul generării în societate a sentimentului de apartenenţă; un alt aspect al politicilor etice este că abordează locul cu identitatea lui arhitecturală, ca pe un sistem de referinţă pentru generaţiile viitoare, previzionând şi pregătind atmosferele viitorului.

Arhitectura oraşului inteligent trebuie să aibă în centrul preocupărilor calitatea acestor atmosfere şi a vieţii urbane. [18] Misiunea e cu atât mai complicată cu cât peste acest deziderat de calitate, se suprapune proiectarea cu obiective îndepărtate, care să asigure flexibilitatea în timp a programelor de arhitectură, împreună cu îndeplinirea altor criterii speciale cum ar fi utilizarea de materiale de construcţii permeabile la LPWAN sau adaptate viitoarelor tehnologii de transmisie a datelor; aceste programe au deja şi vor dezvolta în timp o proprie infrastructură tehnologică (de exemplu putem presupune că proiectarea CAD în sistem BIM va crea modele ale oraşelor, cu scopul studierii reacţiilor lor la variaţi factori interni şi externi) care va face previziuni ale nevoilor imediate şi viitoare.

Dar dacă apelăm la istorie, vedem că guvernele, companiile şi indivizii au pus mare preţ pe informaţiile pe care le deţin, întotdeauna tratând cu precauţie accesul terţilor la acestea. Schimbul de informaţii are o valoare inestimabilă în existenţa oraşului inteligent, iar îngrijorarea pentru ameninţările la securitate şi la intimitatea vieţii private nu poate decât să erodeze acest fundament pe care se întemeiază oraşul intelligent: identitatea locului inteligent. Este creşterea schimbului de informaţii în scopul autoreglării un factor de risc?

2.3. Fenomenul saturat şi oraşul inteligent

Pentru a ne apropia de metoda acestei investigaţii, propunem întâi să găsim, în spiritul teoriei arhitecturii, o justificare fenomenologică a tipului de relaţionare între societate şi dezvoltarea tehnologică.

Bineînţeles, întrebat la un moment dat, nimeni nu se va opune sau nu va vedea un pericol în interpretarea datelor legate de loc, atâta vreme cât se presupune că scopul este o calitate a vieţii îmbunătăţită. Uneori chiar cele legate de individ sunt cedate spre colectare către terţi fără ca deţinătorii să intuiască valoarea globală a modelelor influenţate de acestea.[9]

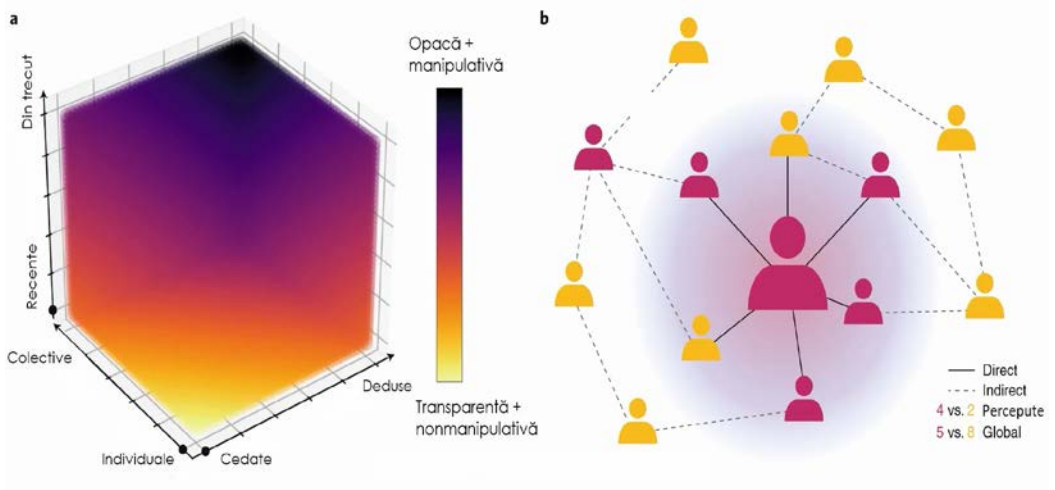

Fig. 3. „Provocări în medii autoreglate tehnologic şi pe platformele social-media. a.Dimensiuni ale cunoaşterii atinse de tehnologia informatică, care le face recomandările opace şi manipulative. b. Mărimea grupului perceput faţă de dimensiunea globală reală,din punctul de vedere al userului (centru) într-o reţea socială omofilă"
Sursa: *htpps://www.nature.com/articles/s41562-020-0889-7/figures/1*

Locul inteligent va genera mult mai multe schimburi de informaţii decât indivizii luaţi separat. Şi, în acelaşi fel ca în cazul utilizatorilor individuali, selecţiile anterioare de autoreglare ca ansamblu fac posibil fenomenul de nudging posibil. Fac manipularea posibilă în cadrul locului inteligent.

Puterea administrativă a locului inteligent poate folosi aceste tehnologii în scopuri care deservesc comunitatea, sau în scopuri manipulative, pe toate palierele de interes, local, regional, naţional, global. Sau poate constitui ea însăşi subiectul acestei manipulări. „Există cel puţin trei domenii în care aceste platforme tehnologice depăşesc cu mult capacităţile cognitive umane: date care se referă la perioade din trecutul apropiat până la cel îndepărtat, (de exemplu ani întregi de istorie a unui loc fizic pe Google Maps), informaţii despre comportamentul uman la nivel colectiv, faţă de cel la nivel individual (de exemplu analiza preferinţelor a milioane de clienţi Amazon care pot constitui baza recomandării unui anumit produs sau aplicaţie soft) şi cunoştinţe obţinute prin metode de deducţie specifice tehnologiei, având la bază date existente colectate.(de exemplu învăţarea de preferinţe gastronomice în funcţie de pattern-ul de deplasare legat de restaurantele unui anumit loc)."[9] Dar dacă datele istorice locale interpretate ar fi cele legate de manifestaţii politice? Dacă sunt corelate cu modele comportamentale date de Big Data? Putem asista la manipularea deciziilor de acceptare a anumitor tehnologii, a anumitor locuri inteligente, a abordării disipative a limitelor inteligente, în scopul creării de breşe neetice?

O ramură a filozofiei preocupată de donaţie (în sensul de dat) care are în centru figura lui Jean-Luc Marion, cu o teorie particulară despre un anumit tip de fenomen denumit saturat, ne va oferi cadrul pentru tipul de percepţie al tehnologiei pe care îl avem în vedere. Prin asemănarea cu actul contemplării unui obiect de artă,

mai exact a unui tablou semnat Mark Rothko, ca un caz particular sugerat de Marion. O opera de artă se uită la noi cu intensitate, creând o conexiune exclusivă şi înrobitoare, captând întreaga noastră atenţie în aşa fel încât nimic nu va scăpa vortexului de admiraţie, unic direcţionată spre esenţa ei. Aceasta este o esenţă care radiază atât de intens, încât topeşte personalitatea artistului şi orice asemănare cu realitatea imediată. Esenţa scoate din ambianţă orice rival care ar concura pentru atenţie, atingând „o asemenea intensitate care adesea saturează capacitatea vederii mele, şi chiar depăşind această capacitate." [12] Marion numeşte acest tip de esenţă – idolul.

Fig. 4. Vladimir Rothko – Pânză neagră la NGA 2010 - In the Tower
Sursă: *Cu permisiunea autorului Dl Matthew Langley*
https://i1.wp.com/www.matthewlangley.com/blog/uploaded_images/rothko_front-769229.jpg [9]

„*Name your idol and you will know who you are*".[14, p.61] Teoria arhitecturii cu aura ei fenomenologică, ne dă şansa să studiem locurile inteligente şi limitele lor ca zonă de suport pentru manifestarea idolului generat de această tehnologie ce ne depăşeşte cu mult capacităţile intelectuale. As vrea să parafrazez o afirmaţie a aceluiaşi Jean-Luc Marion, a cărui teorie despre donaţie şi fenomenul saturat o considerăm adaptabilă la studiul comportamentului generat de dominaţia tehnologică. Pentru plăcerea intelectuală, am substituit „arta" cu „tehnologia", obţinând declaraţii definitorii la extremă limită pentru o nouă religie, cea care divinizează tehnologia. (Artistul ales de Marion pentru explicarea fenomenului saturat, Mark Rothko este chiar un vizionar, putem să asimilăm formal imaginea pieselor negre dela sfârsitul carierei lui cu aspectul unui iPad închis.)

Fig. 5. No. 2, 1964, mixed media on canvas, 266.5 x 203.2 cm (105 x 80 in.).
Collection of Robert and Jane Meyerhoff
Sursa: *www.nga.gov*

„Ridicarea *informației* la nivelul de original al originalului, de fapt la nici mai mult nici mai puțin decât originea imperioasă a fenomenalității, adică poziția și locul lucrului în lume." [14, p.63-64], iată premisa fenomenului saturat legat de adoptarea, contemplarea și urmarea oarbă a tehnologiei. „*În acest fel se realizează idolul: interfața vizibilă, pe care privirea nu o poate străpunge și abandona, pentru că aceasta o saturează de prima data, captând toată admirația.*"[14, p.60]. Sau, foarte simplist, abundența informațiilor va conduce la sabotarea atenției.

Contemplarea tehnologiei și abandonul complet în fața ei ia forma unui fenomen saturat. Dar cum se întâmplă acesta în locul inteligent? Este acest idol benevolent sau imprevizibil? Cum se întâmplă adorația lui?

2.4. Idolul orașului inteligent

„Logic is a poor guide compared with custom." spunea Churchill într-un discurs celebru [23]. Propoziția era în așa fel concepută încât să convingă audiența că sala distrusă de bombardament a Camerei Comunelor trebuie restaurată întocmai, nu lărgită și transformată de la un plan dreptunghiular la un plan circular dar orientat spre un centru de interes , al modernității. Churchill era avocatul unei tradiții care se întemeia pe un obicei sine qua non a esenței umane: confruntarea directă (uneori chiar agresivă verbal) și acceptarea diversității de opinii.

Logica pură pare a fi însă, deocamdată, principiul de existență și dezvoltare a tehnologiilor în raport cu locul inteligent. Inferența logică fără putință de contestare, manifestată în mod fractal, până la dantelaria fină a structurii comportamentului uman. Unde poate eșua această logică? Există un spațiu existențial care va scăpa controlului logicii și va deveni astfel imprevizibil?

Teoria catastrofei (TC) este o metodă de modelare a fenomenelor discontinue a sistemelor dinamice. Este cea care studiază schimbarea bruscă esenței definitorii a

unui sistem, în condiţiile în care forţele aplicate au o creştere fină şi constantă. Un baraj, de exemplu, supus presiunii constante, în creştere, îşi va păstra forma iniţială până la un anumit moment când conformaţia lui va fi brusc schimbată la ruperea lui. O societate care îşi păstrează echilibrul în condiţii grele până se revarsă toate frustrările reprimate printr-o revoluţie. Această teorie matematică explică şi fenomene naturale, cum ar fi percepţia aparte a sclipirilor razelor lunii pe valurile unui lac noaptea, mereu în perechi de puncte luminoase.[3]

Când aplicăm forţe continue, ne aşteptăm la efecte continue. Când însă se întâmplă fenomene discontinue, când acestea au o anvergură impresionantă sau sunt devastatoare, le numim catastrofe, de unde şi numele bulversant de teoria catastrofei. [3] Comportarea discontinuă a sistemelor dinamice a fost început de matematicianul Rene Thom, şi are deja studii de aplicaţii comportamentale sau în domeniul ecologiei. Vom modela sistemul dinamic al atmosferelor inteligente după această teorie.

3. Povestea celor două oraşe inteligente

Am văzut la secţiunea 2.2 cum atmosfera depinde în mod direct de păstrarea identităţii locului şi de etica politică reflectată în social. La secţiunea 2.1. am identificat un câmp de variaţie a identităţii locului inteligent, prin coordonarea de caracteristici legate de volumul de informaţii generate, culese şi deduse (un volum al schimbului de informaţii) cu cele proprii arhitecturii (sit, valoare culturală, calitatea vieţii).

Teoria catastrofei (TC) are calitatea de a ne oferi suport pentru intuiţie şi descrie, într-un mod convingător, cum întrunirea concomitentă a anumitor condiţii va genera o bifurcaţie a comportamentului posibil, cuantificabilă şi previzibilă. În cadrul complex al oraşului inteligent este de interes viitorul colaborării între tehnologie şi societate, această colaborare putând îmbrăca mai multe forme: a respingerii (de la moderată la vehementă sau revoluţionară), a armoniei, a manipulării.(Cuvântul colaborare este folosit pentru a accentua semnificaţia personificarii în context a tehnologiei, cu aluzie la ultimele cercetări legate de IA).

Această teorie matematică ne ajută să supunem analizei modul în care permiterea creşterii controlului exercitat de tehnologie (acest idol indiscutabil), chiar mediat de moderarea politică susţinută de social) poate afecta evoluţia atmosferelor oraşului inteligent, prin crearea condiţiilor de salt (negativ sau pozitiv) în gradul de acceptare socială a acestui control.

Identitatea unui loc (oraş) inteligent poate varia liber între două limite opuse. Valoarea pozitivă o asimilăm cu o identitate puternică, susţinută în timp prin continuitatea memoriei colective, o reală importanţă culturală şi autenticitatea şi multitudinea datelor în schimburile locale şi externe. Aceste caracteristici cumulate pot fi vizualizate sub forma unei mandale urbane tridimensionale, cele trei dimensiuni fiind geografia, cultura şi informaţia. Valoarea negativă este dată de demontarea sentimentului de apartenenţă, de pierderea sau distrugerea valorilor culturale şi de inexistenţa sau lipsa de credibilitate corelată cu intenţiile manipulative ale informaţiilor ce constituie intrări-ieşiri. Între aceste două extreme,

identitatea trece printr-un interval valoric de tipul *no man's land* care în concepţia noastră nu constituie un minim al identităţii, ci o neutralitate specifică locurilor noi implantate artificial sau cu tradiţie dar reabilitate neorganic, fără repere culturale autentice sau care pot fi însuşite în timp, conduse şi administrate prin metode ştiinţifice şi prin intermediul tehnologiei.

Cu cât locul are o identitate mai puternică cu atât gradul de coordonare a aspiraţiilor sociale cu etica politicilor locale este mai ridicat. Cu cât identitatea locului inteligent este mai destructurată chiar până la deconstrucţie, cu atât locul va fi trăit cu mai multă frustrare, respins şi lăsat pradă descompunerii (e.g.paragină, depopulare, infracţionalitate) prin politici nonetice.

Vom adăuga o nouă variabilă, în acest ansamblu dinamic, şi anume gradul de autocontrol al sistemului tehnologic, gradul în care se cedează către acesta reglarea sistemului urban, şi, în acelaşi timp, numărul de libertăţi la care se renunţă în scopul împlinirii unei atmosfere de armonie şi funcţionare perfectă, care este deziderатul oricărei administraţii.

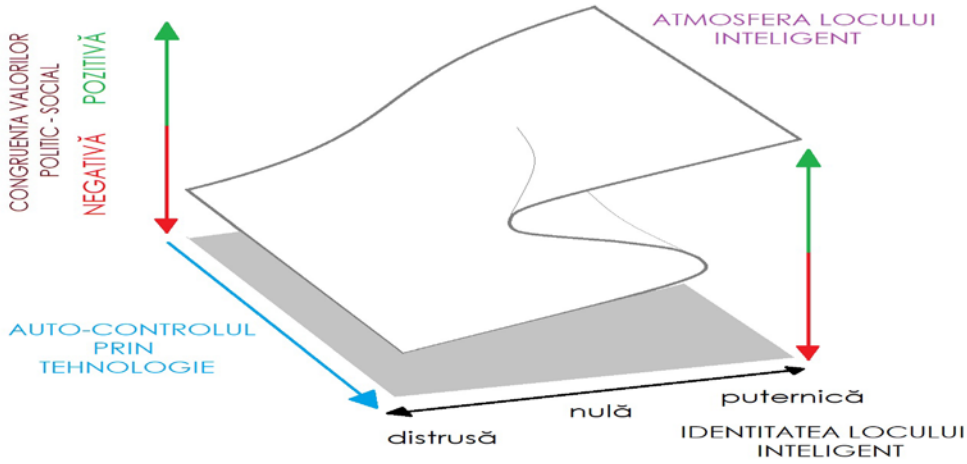

Fig. 6. Comportamente posibile în atmosfera inteligentă

Vizualizăm acest control ca o forţă în creştere continuă, fină, care în teoria matematică a catastrofei TC acesta este un factor care generează o bifurcare, în sensul că pe măsură ce autoreglarea prin tehnologie creşte în anvergură, cu cât influenţează mai mult atmosfera locului inteligent, acceptarea de către social a paradigmei are o valoare de tip dual: ori/ori. Variaţia celor trei tipuri de valori, două de control şi una de bifurcare, va rezulta grafic într-o suprafaţă cu dublă curbură, o suprafaţă tridimensională de soluţii, cu o caracteristică aparte de pliere, denumită „ cusp"- vârf, creastă.

Interpretăm că de la o anumită valoare a controlului mediat tehnologic, valoarea acceptarii sociale a politicilor legate de locul inteligent nu mai este singulară, ci se regăseşte pe două paliere, unul în spaţiul pozitiv al graficului tridimensional, una în spaţiul negativ. Suprafaţa de valori între cele două paliere

este în TC atât de puțin probabil de atins, încât o considerăm neglijabilă. Pentru mai multă claritate, graficul de mai sus reprezintă gama de variații în atmosfera locului inteligent, corespunzătoare răspunsului social la incrementarea fină a autocontrolului tehnologic.

Pentru un punct caracterizat printr-o identitate din zona neutră, cu un vector de control mediat tehnologic puternic și o stare de echilibru social, acest echilibru va fi perturbat în mod acut, după o anumită limită de cedare a autonomiei în favoarea tehnologiei: echilibrul va deveni atât de puțin probabil încât este neglijabil, starea de congruență între valorile sociale și cele politico-administrative va fi capabilă de salturi între două stări de grație: cele două orașe inteligente posibile.

Bifurcația are ca și cauze un model comportamental matematic, dar și un model filozofic cu rădăcini în fenomenul saturat prezentat anterior. Idolul tehnologic, pavoazat cu soft-uri intuitive și inferente infinite, alimentat cu informații directe dar și cu predicții generate prin aceste softuri; acesta este adorat și captează nemijlocit atenția pe aria de control cu condiții previzibile de comportament, generând o atmosferă stabilă și apropriabilă.

Această arie de control este redată din nou în figura 7, care reprezintă proiectarea suprafeței grafice dată de variația atmosferelor, pe planul identității locului inteligent. Suprafața marcată cu gri reprezintă proiecția repertoriului de atmosfere care generează stabilitatea și congruența de valori între politic și social. Este suprafața cu condiții de acceptare a locuirii, a trăirii spațiului în forma dată (în sensul lui Marion). Pe această suprafață se identifică o zonă haşurată ca proiecție a atmosferelor în care comportamentul poate vira dinspre pozitiv spre negativ și invers - un „cusp" de valori. Prin cuantificare TC ne poate da o valoare limită a autoreglării tehnologice de la care acest comportament discontinuu se va manifesta, și un cumul de condiții care vor genera discontinuitatea, aceasta intervenind în mod irațional și neașteptat.

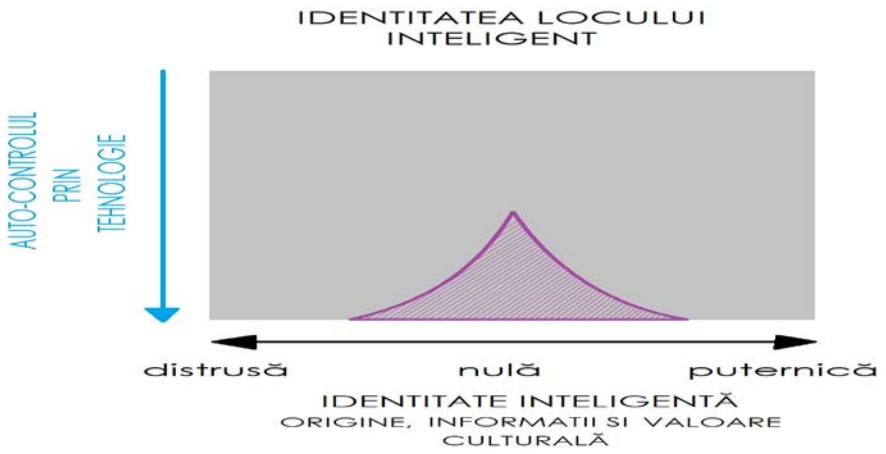

Fig. 7. Cusp-ul proiectat pe planul identității locului inteligent

Interpretăm ca, aplicând TC, vom identifica anumite tipuri de locuri inteligente care vor fi respinse social sau vor genera nemulțumire până la disensiuni grave cu politicul, și anume acelea care se caracterizează prin nulitatea identității combinată cu o variație a controlului tehnologic în creștere constantă. Aceste locuri particulare se sustrag de sub dominația idolului tehnologic, și generează condițiile pentru o poveste cu un final greu de anticipat.

În lipsa fenomenului saturat generat de tehnologie, această expresie a inteligenței și spiritului uman care frizează și provoacă divinitatea, societatea își poate manifesta liberul arbitru, printr-o revelație care nu este de natură divină, ci are ca bază valorile umanității. Dărâmarea idolului pune în fața societății orașului inteligent două opțiuni, o bifurcație de drumuri, la fel de posibile.

Atmosfera se poate îndrepta pentru valoarea negativă a acceptării sociale, și atunci vom asista la fenomene corespunzătoare unui hazard antropic de tip ideologic de mai mică sau mai mare amploare, până la dezinstalarea totală a controlului tehnologic sau depopularea completă a orașului smart respectiv. Un oraș inteligent al revoluției. Sau se poate îndrepta către o valoare pozitivă a acceptării sociale, care suprapusă peste nulitatea identității locului și instaurarea progresivă a controlului tehnologic, va crea condițiile de hazard antropic asemenea ideologic prin manipulare socială în sensul cel mai curat dystopian.

La limită, vom continua graficul de cusp al TC, cu observația că această dualitate se menține pe o suprafață delimitabilă romboidală, care ne privește provocator din centrul ariei de dominație a idolului.[3] Ne este sugerat prin teoria matematică faptul că domeniul de manifestare al bifurcației este limitat, odată depășit un anumit prag de cedare a controlului către tehnologie, atmosferele se stabilizează, poate prin atingerea unui nou nivel de conștiință socială care îmbrățișează tehnologia ca pe o nouă formă de existență, un nou dat. Această nouă treaptă de civilizație poate fi văzută ca o migrarea a conceptului de smart city către conceptul de smart me, implicând la un moment dat științele neurologice în procesul autoreglării ecosistemului urban.

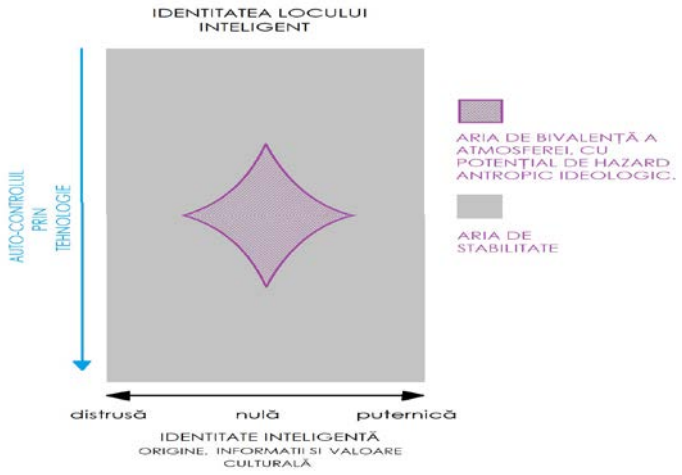

Fig. 8. Aria corespunzătoare cusp-ului la continuă creștere a controlului tehnologic

Acestea sunt cele două posibile orașe inteligente din titlu cu povestea lor. Prima idee a reprezentării acestor variante a pornit de la narațiunea dickensiană care reprezintă cea mai bine vândută carte a tuturor timpurilor. Mai ales din celebrul paragraf de deschidere a acesteia. Dar mai recent, o poveste de tipul steam punk scrisă de copilul teribil al literaturii fantasy contemporane, Neil Gaiman, a deschis aceeași perspectivă asupra coexistenței a două orașe posibile, cu viziuni opuse asupra idolului tehnologic, negându-se reciproc(*Neverwhere*, 2008).

Predicția de comportament se va verifica pe măsură ce orașele inteligente vor fi din ce în ce mai multe și mai impresionante prin performanțele lor. Deja putem găsi exemple unde predicțiile pot fi testate, dar suntem încă la începuturile implementării lor. Un exemplu este Songdo primul smart city din Coreea de Sud, și declarativ din lume, construit cu ajutorul compania de IT Cisco [13] la o distanță relativ mică de Seoul, doar 60 de kilometri, o oră jumătate de condus pentru locuitorii atrași de ineditul proiect. Lansat în 2003 și implementat în 2015 pe o suprafață de 600 de hectare recuperate din Marea Galbenă. Conceput ca un centru economic major ajutat de o zonă rezidențială de lux atrăgătoare ca prețuri care să ofere o calitate a vieții care să devină un standard de atins și un model de urmat. Și totuși presa îl declară ,,un proiect impersonal" care ,,nu este un mare succes"[13] Proiectul este alcătuit din volume din metal și sticlă, reunite în jurul unui reper înalt de 305 metri, North East Asia Tower, și nu conține muzee sau cinematografe. Este populat doar la jumătate din așteptări, locuitorii fiind atrași de noutatea proiectului și de facilitățile oferite: spații verzi generoase, traseu de biciclete de 25 de kilometri, o ofertă de învățământ de calitate, dar angajații celor (doar) 58 de companii cu sediul în Songdo declară că nu pot locui acolo. Orașul este foarte dezvoltat din punct de vedere tehnologic, există 500 de camere video de supraveghere în constantă legătură cu poliția, există internet pretutindeni și e în dezvoltare un proiect de inovare în IoT. Rețelele de electricitate funcționează după un program de eficientizare, există sisteme de colectare a gunoiului care reușesc o reciclare în proporție de 76%. Și totuși, care este cauza lipsei de atașament a angajaților și locuitorilor din Songdo? Pe graficul de mai sus, punctul corespunzător atmosferei locului proiectate este din gama celor duale, și deoarece controlul tehnologic nu este forțat (deși putem spune că orașul este sub continuă supraveghere) reacția nu este foarte violentă. Identitatea orașului Songdo - locul inteligent, tinde către valori de neutralitate, din cauza neglijării complete a scenei pentru o viață socială complexă, făcând din Songdo un ,,ghetto pentru cei bogați"[13], cum îl numește Le Monde.

Fig. 9. The Tale Of Two Smart Cities - a possible skyline

4. Concluzii

„What I look at that is visible decides who I am. I am what I can look at. What I admire judges me." - Jean-Luc Marion [12]

Aplicația noastră constituie un punct de plecare pentru o posibilă investigare a potențialului proiectelor viitoare, în cadrul unor studii de fezabilitate complexe. Aceasta este o demonstrație a unui posibil final al orașelor inteligente, privindu-ne sfidător drept din centrul acestei tornade a dezvoltării inteligenței artificiale. În același timp, este o pledoarie în favoarea curentului de arhitectură actual, având ca susținători de avangardă pe Peter Zumthor și Juhani Pallasmaa, o nouă abordare a trăirii spațiului cu aportul tuturor simțurilor, depășind supremația absolută a văzului, și punând într-o nouă lumină intuiția care își adună informațiile subtile și subliminale din toate sursele receptării senzoriale: auz, miros, interacțiune haptică, atmosferă. Această atmosferă, inteligentă sau nu, este cea care dă forța și reziliența locului inteligent, este acea calitate pe care un individ sau un colectiv o poate evalua instantaneu, fără chiar a distinge toate detaliile constructive sau vizuale ale acestui loc. Intuirea atmosferei locului este probabil legată de evoluția speciei noastre, de instinctul de supraviețuire pus în fața unui adversar dotat cu aceeași armă a inteligenței, celălalt om. Această intuiție poate fi și ea manipulată, dar acesta este subiectul altei discuții.

În lipsa unei conștientizări a importanței identității locului, în lipsa preocupărilor legate de evaluarea, conservarea și predicția acestei identități care are o natură organică prin faptul că este muritoare dar se poate reproduce la infinit prin procedee de reabilitare, conservare, restaurare și ridicare la rang de conditie sine qua non a dezvoltării durabile, vom asista la fenomene surprinzătoare, ca fenomenul Songdo, sau anterior lui, fenomenul Pruitt-Igoe. La acesta din urmă, idolul nu a fost, după părerea noastră tehnologia, ci modernitatea-cu-orice-preț, o altă latură a vanității civilizației noastre, care începe să înțeleagă că percepția spațiului și hărțile noastre mentale își găsesc locul în creier în hippocampi, cea mai îndelung testată formațiune, care face parte din sistemul denumit peiorativ până astăzi ,,complex

reptilian”[11]. Vom putea să anticipăm viitorul orașului reglat de tehnologie după ce vom înțelege mai clar legăturile între neuronii specifici de reprezentare a spațiului, intuiție și atmosfera locului. Până atunci trebuie să fim conștienți de un posibil hazard antropic având ca motiv o ideologie legată de implementarea fără discernământ pe scară largă a tehnologiei, cu cele două extreme ale sale.

În anticiparea pierderilor cauzate de acest tip de risc pentru dezvoltarea orașelor inteligente, propunem ca soluție crearea unor strategii de scoatere a orașelor inteligente din zona neutră a identității arhitecturale și de promovare a rezilienței estetico-atmosferice a proiectelor de arhitectură, și cercetarea și definirea metodelor prin care locurile inteligente pot fi sau deveni ,,palate pentru umanitate” [20].

Este această aplicație matematică și un îndemn către echilibru, deoarece ne confirmă intuiția că acest idol al tehnologiei poate fi adorat, dar nu în cadrul unui monoteism, ci într-o construcție fenomenologică de tip politeism, în care să dialogheze cu alți idoli, la fel de imperfecți dar la fel de puternici, cum ar fi tradiția sau frumusețea (creată de matematică, de artă sau de natură). Această confruntare tragică și fecundă între doi sau mai mulți idoli, este baza morfogenezei atmosferei autentice și vii pe care o vom simți inundând o lume, acea lume care este născută de marea opera cercetată de Heidegger, sau care este dată de pictura de geniu descrisă de Marion. O posibilă lume de acest rang este și cea a orașului smart al unui viitor umanitarist.

Fig. 10. Un colț al expoziției Mark Rhotko la NGA
Sursa: http://matthewlangley.com/blog/?p=6

Post Scriptum : „Era cea mai buna dintre vremi, era cea mai năpăstuită dintre vremi, era epoca înțelepciunii, epoca neroziei, veacul credinței, veacul necredinței, răstimpul Luminii, răstimpul întunecimii, primăvara nădejdii, iarna deznădejdii, aveam totul în față, aveam doar nimicul în față, ne înălțam cu toții de-a dreptul la ceruri, ne cufundam cu toții de-a dreptul în iad – pe scurt, epoca aceea era atât de asemănătoare cu cea de acum, încât unele dintre autoritățile cele mai proeminente au stăruit să fie prezentată, în tot ce avea ea bun sau rău, numai la gradul superlativ.”[3]

Mulţumiri

Mulţumiri doamnei profesor doctor Cristina Olga Gociman, care prin discursul despre teoriile riscului şi a hazardului, mi-a dat uneltele de lucru în căutările legate de manipulare ca hazard ideologic.

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Intelligent safety and emergency lighting solutions in disaster situations

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Abstract

Disasters. They always happen, with a probability of occurrence that is almost independent of the high-speed development of our technology, economy and society as a whole.

The most important measure humanity can take is to focus on reducing the loss of human lives and to plan intelligently the measures that need to be taken in order to reach a high level of overall disaster resilience.

We will bring into discussion some of the challenges that can appear when people need to find their way out from interior spaces in case of disaster. Some of those disasters can cause electric power outage in the building, leaving the evacuation routes visibility relying only on the electrical emergency lighting systems and we will see that those systems are not always infallible.

***Case study** : the "ice storm" phenomenon that impacted Canada in December 2013. At the height of the storm over 300,000 Toronto Hydro customers had no electricity or heating.[1]*

***Unexpected problem** : Basements and other interior areas without natural light in multiple high-rise buildings in Toronto have been left in complete darkness due to the failure of the safety lighting systems, endangering the evacuation of the people inside.*

A new problem arose : can there be an alternative solution for visually signaling the escape routes ?

***Objectives:** Technological solutions for this impasse exist, but are being used in other applications : interior decorations, entertainment industry, exploration research and military industry .*

Those possible alternative solutions are: phosphorescent elements and chemical light tubes.

We will analyze how and if we can implement these technologies through smart design on a large scale for the emergency evacuation paths.

Case study solution : *project (Toronto - Arc Condominiums) emergency escape route signaling through design and innovative use of phosphorescent mosaic.*

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Keywords*: emergency lighting, safety lighting, photo luminescent mosaic.*

1. Introduction

Disasters. They always happen, with a probability of occurrence that is almost independent of the high-speed development of our technology, economy and society as a whole.

Natural disasters : earthquakes, wildfires, floods, volcanoes, landslides, severe solar storms, extreme temperatures, tsunamis, disease epidemics and insect/animal plagues - they were always happening and they will happen again in the future.

On top of that we have the anthropogenic hazards, technological or the man-made disasters: industrial accidents, explosions, fires, terrorist attacks, complex emergencies or conflicts, a.s.o.

Some of the deadliest disasters in our world history were caused by human actions.

According to the Hyogo Framework for Action [2] created in 2005, disaster resilience is determined by the degree to which individuals, communities and public and private organizations are capable of organizing themselves to learn from disasters in the past and reduce their risks to future ones, at international, regional, national and local levels.

Disasters can rarely be controlled, it is very difficult to be predicted and most of the times they can not be stopped.

In this context, the most important measure humanity can take is to focus on reducing the loss of human lives and to plan intelligently the measures that need to be taken in order to reach a high level of overall disaster resilience.

Historical data are showing us that the world has seen a significant reduction in disaster deaths by means of creating more resilient infrastructure, emergency preparedness, and response systems.

In the early-to-mid 20th century, the annual death toll from disasters was huge, often reaching over one million per year. In recent decades we have seen a substantial decline in the number of deaths, fewer than 20,000 die, and in the last ten years, this has often been less than 10,000 (per year).[4]

We will bring into discussion some of the challenges that can appear when people need to find their way out from interior spaces in case of disaster. Some of those disasters can cause electric power outage in the building, leaving the evacuation routes visibility relying only on the emergency lighting systems.

Every single type of emergency light today is depending on electric or electronic technology in one way or another.

Currently, the safety lights rely on two major categories of power sources: rechargeable batteries and electric energy directly from the power grid that charges

the batteries when they drain. We will see that safety lighting today is depending on regular maintenance and periodical replacement of elements in order to work.

What technology can we use to eliminate these shortcomings?

1.1. Our way out of the building: how easy is to get out ? - Evacuation routes

In an emergency situation people need to find their way out fast and easy.

The way out may be a sinuous route on corridors and open interior spaces followed by an even more difficult road down the evacuation stairs.

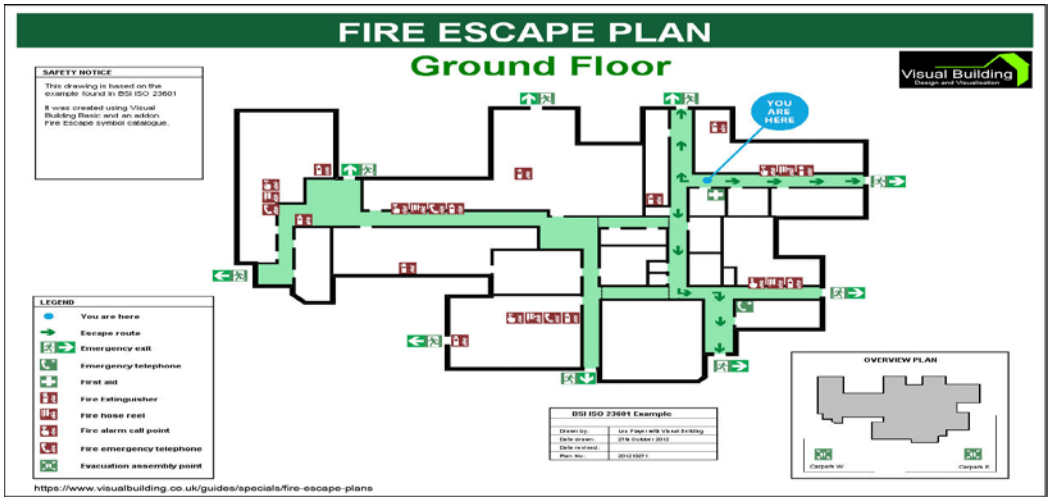


Fig. 1. Fire escape plan example

Source: *https://www.visualbuilding.co.uk/guides/specials/fire-escape-plans*

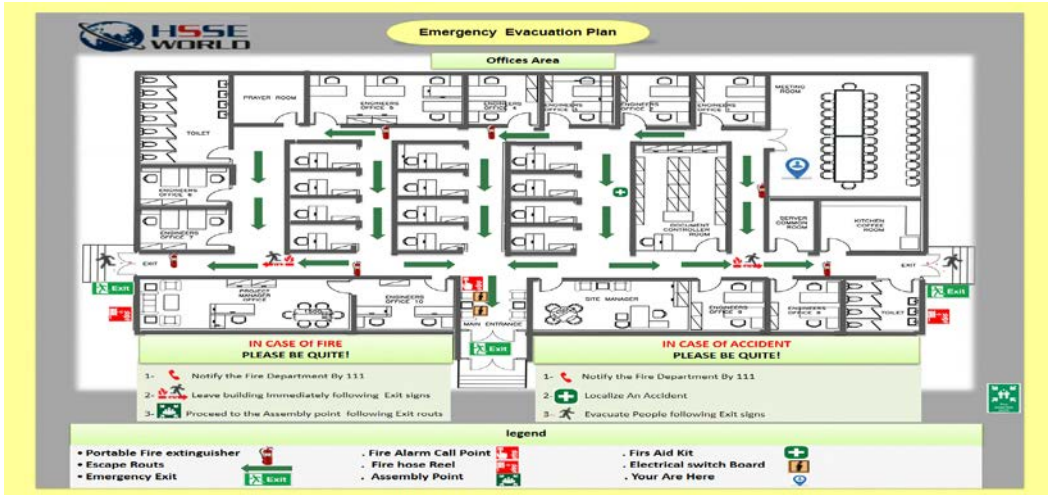
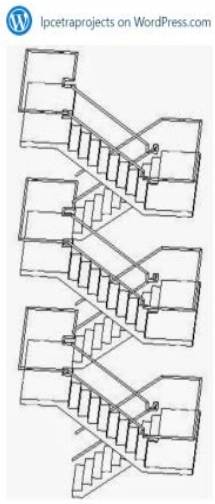


Fig. 2. Fire escape plan example

Source: *https://hsseworld.com/fire-emergency-evacuation-plan-and-the-fire-procedure/*



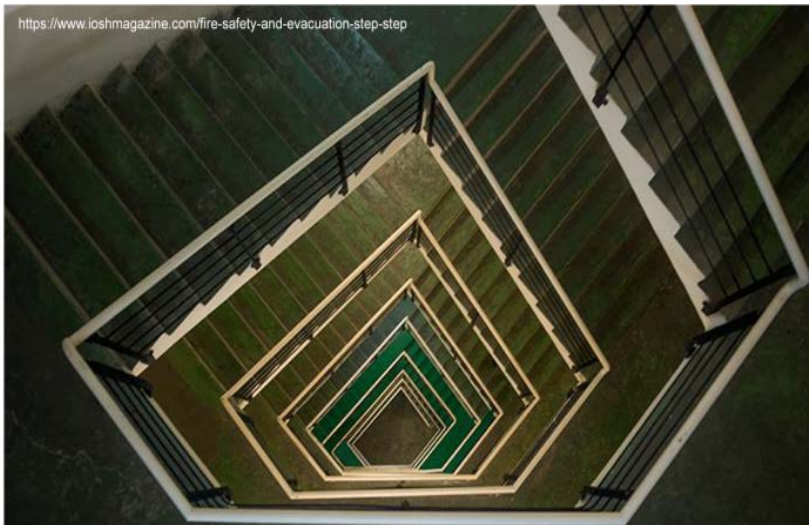


Fig. 3. Different types of interior evacuation stairs
Source: *https://lpcetraprojects.files.wordpress.com/2015/06/7547c-multistorey07.jpg*
https://www.ioshmagazine.com/fire-safety-and-evacuation-step-step

Very often those routes are in the interior of the building with no possibility of receiving natural light. If a disaster happens at night time, natural light from windows or glazed doors cannot be counted on.

This is what we call the "pitch black" situation.

Why can this happen and what alternative solutions should we seek in order to avoid this situation ?

We will try to find some answers to all those questions in the following chapters.

1.2. How much light do we need in order to see our way out in the dark ? - International standards

Emergency lighting plays a vital role at critical times in guiding people that need to escape quickly and safely from a building.

Specific requirements for emergency lighting are set out in law, and international standards. [1]

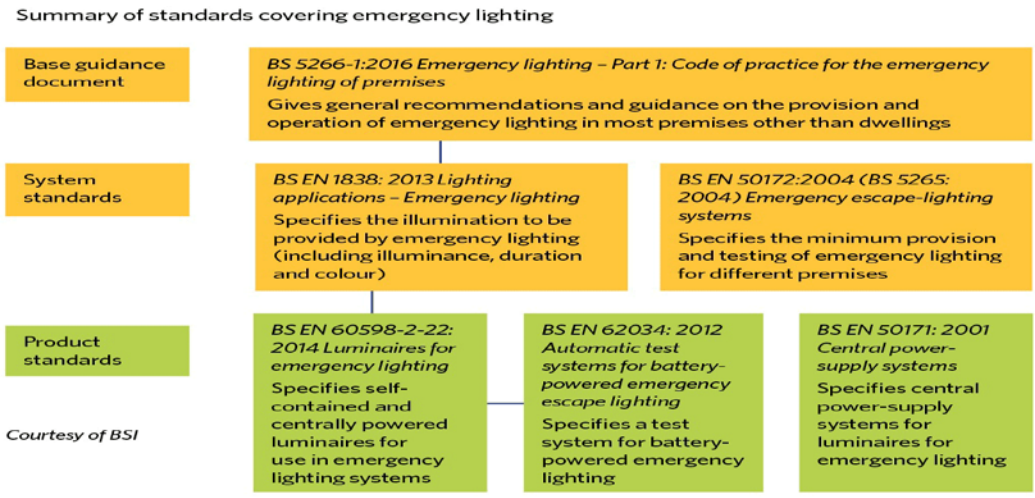


Fig. 4. Summery of standards covering emergency lighting
Source: *https://www.cibsejournal.com/general/emergency-lighting-standards/*

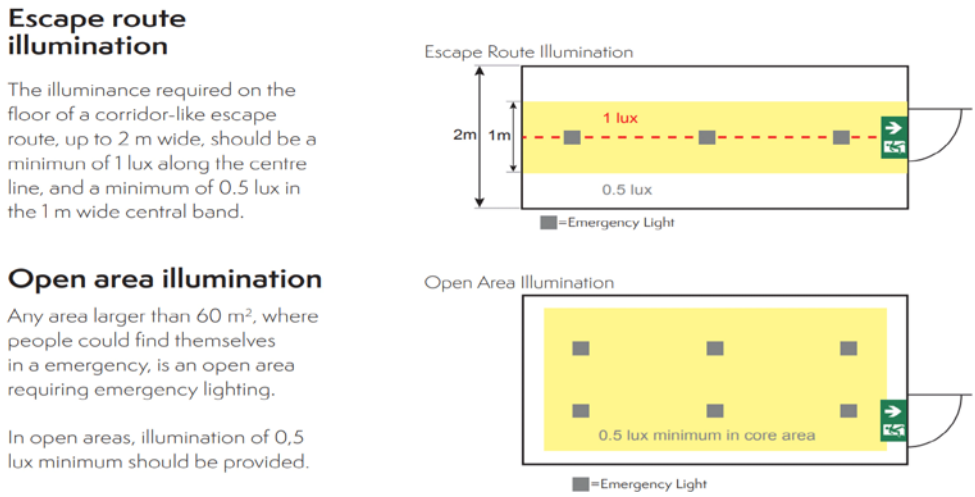


Fig. 5. International standards
Source: *https://www.teknoware.com/*

Above we can see just a few examples of standards regarding minimum illuminance

levels on the escape routes.

Those standards have some major requirements:

- a general minimum luminance (visually perceived brightness) of specific interior spaces. The spaces in the building are categorized by their importance ,as per how many people are living, working or passing through those spaces daily or how vital are those spaces in the emergency exit path trajectory,

- how the light fixtures are distributed in the building (distances between fixtures, distance to the floor, a.s.o.),
- how long the emergency light system needs to be able to stay open.

For example, according to the international safety standards, emergency exits and escape routes must be illuminated by a minimum of 1 Lux at all times and in the event of a power failure, emergency lighting must be able to provide this level of illumination for a minimum of **one hour.**

2. Why can it happen ? - What type of hazards can trigger the malfunction of the emergency escape lighting system ?

2.1. The batteries

In general, the emergency light systems rely on rechargeable batteries connected to the electric power grid and they are required to last 4 years, as per EN60598 2 – 22 which states: "Self-Contained Luminaries shall incorporate batteries which are designed for at least 4 years of normal operation. [3]

For example, service life for nickel cadmium batteries is mentioned by the manufacturers as being 4 years.

In order to make sure the safety lights will turn on in case of power outage, the central battery unit and the emergency exit lights need to be maintained regularly and batteries need to be replaced after the battery life time has passed, usually every 4 years.

Looking at the international regulations regarding emergency lighting shown before, we will notice that the number of safety lighting devices and exit signals in a building is significant. Those devices need to be placed at every node of the emergency exit path, on every single floor, above or next to every single door, and all of them need periodical maintenance and battery replacement. The maintenance requires also periodical testing of the entire system, so the batteries are drained to some extent during testing and also during idle times between use, so electricity is consumed in order to get fully recharged again. This comes with a cost, raising the expenses of electric bills and periodical expenses on acquiring new batteries that need to be replaced every 4 years.

The building management team or the owners of the building sometimes fail to perform all the tasks required in order to maintain in perfect shape the emergency lighting system because they forget, they neglect or they lack the funds to do so.

For each of this reasons the emergency exit light system can fail to work at a time in need.

2.2. Solar powered emergency lighting system

The solar power industry boom in the last decade has brought lots of enthusiasm also in the emergency lighting system users.

We will find in the market various types of solar powered emergency lighting systems. We need though to take into consideration that the solar cells and the adjacent cables increase the number of component parts of the lighting fixture, increasing the risk of mechanical damage. On top of that, those fixtures still need a chargeable battery that require maintenance as we mentioned in the previous chapter. Another important observation is that solar panels need direct sunlight exposure in order to charge and this fact narrows down the possible areas we can place those lighting fixtures to outside spaces alone or in close proximity to a window or a glazed surface that receives natural daylight.

2.3. Electronic components failure causes

Every single type of emergency light today is depending on electric or electronic technology in one way or another.

Electronic components are not indestructible and they have a wide range of failure modes. These can be classified in various ways, such as by cause or time. Failures can be caused by excess temperature, excess current or voltage, ionizing radiation, mechanical shock, stress, impact, severe solar storm or even an electromagnetic pulse attack.

All those types of hazards are likely to happen quite often, except the last two where there are still scientific debates about how probable their occurrence can be in the future.

"It is possible that a nuclear EMP may never happen where you live. On the other hand, a severe solar storm that will destroy most of the world's power grids appears nearly inevitable at this point. Protection against the damage of a severe solar storm could be done easily and rather inexpensively by the electrical utilities; however it is not being done, and there are few signs that it will be done." [5]

A severe solar storm (super-storm) happens when the sun opens its coronal holes and a massive amount of electromagnetic radiation is spread into space. When this radiation hits our planet's magnetosphere, it triggers a geomagnetic storm, that could destroy the majority of our power grid transformers possibly all over the world . We are looking in this case of a possible worldwide electric power loss and the damages would be so severe that it could take years until all electric and electronic systems worldwide get replaced with new ones.

The last solar super-storm took place in 1859, but back then the power grid was not yet in place. The only technology we had at that time was the telegraph, and it's function was disrupted by the fact that the solar flares have set most of the telegraph pylons on fire.

In 1921 another large solar storm happened, for a shorter period of time than the previous one, affecting a smaller geographical area.

We cannot exclude the future possibility that a solar storm can happen, so it is always better to be prepared for it.

2.4. The smoke can reduce the visibility of the emergency escape lighting system

Fire is one of the most dangerous, lethal and destructive disaster.

The smoke that is created by fire inside a building is not only toxic but is a secondary element, along flames, that can obstruct the safe access to emergency exit paths.

When fire occurs it is most likely that the electric system of the building is affected, leading to electric power outage. This will trigger the emergency light system to start working.

The propagated smoke is usually dark and thick and it tends to accumulate on the upper space of the room, just under the ceiling, covering the safety light fixtures that are usually placed on the ceiling and reducing the amount of light that has to reach the floor and the surrounding space.

Lately we will find more and more examples of emergency lights placed on the walls at a lower level than the ceiling in order to avoid this issue, but the majority of buildings still have the old standard system of ceiling mounted emergency lights.

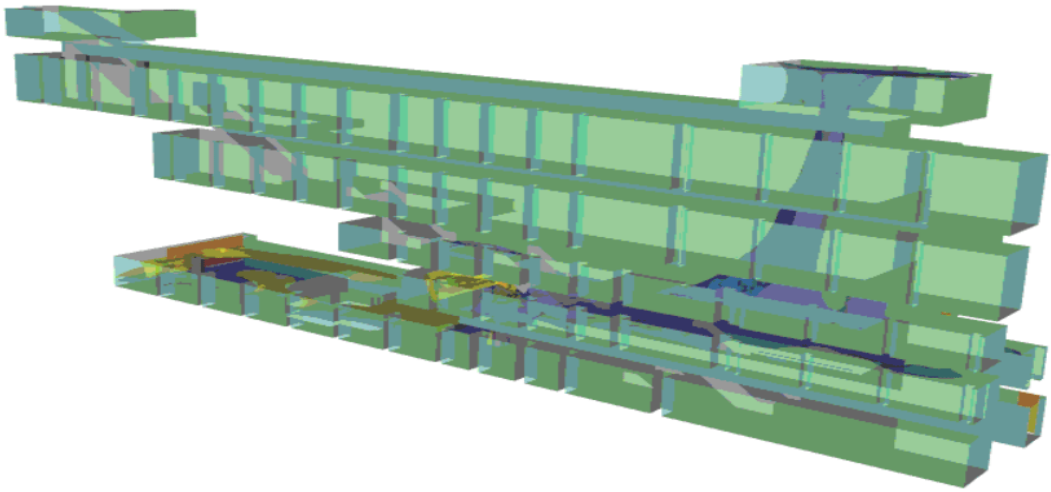


Fig. 6. CFD simulation of fire and smoke propagation in the National Museum of Contemporary Art in Athens
Source: *https://simtec-europe.si/*

Fig. 7. Smoke propagation in the interior of a building
Source: *https://www.elp.uk.com/ (with modifications)*

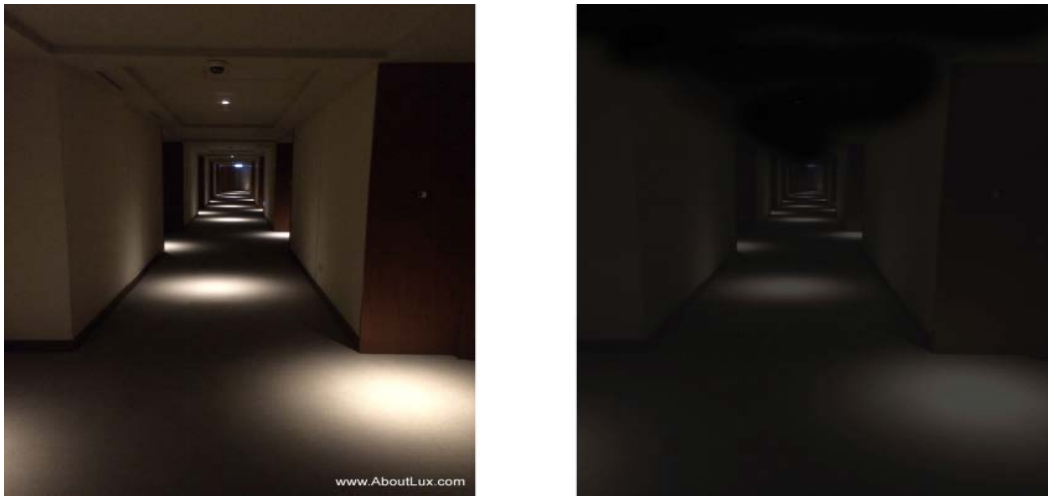


Fig. 8. Smoke propagation in the interior of a building
Source: *https://aboutlux.com/ (with modifications)*

We will see that the alternative solution we will analyse at the end has the advantage of being placed mostly on the floor, so the smoke propagation will not affect the light visibility at all.

2.5. Electric power outage due to a natural disaster : frozen rain / ice storm

The electric power outage in urban networks is a phenomenon that occurs frequently in case of hazard: seismic event, flood, fire, hurricane, tsunami and many other types of disaster.

This phenomenon is largely due to the fact that the electricity transmission system in the city is largely performed by cables located above the ground, exposed to climate factors, physical aggression (supporting poles may break or even cables may be damaged by mechanical factors - wind, ice weight, etc.).

Case study:

In December 2013 we witnessed the "frozen rain"/ "ice storm" phenomenon that impacted the central and eastern portions of Canada.

The first wave of freezing rain began on 20 December; it coated the city in a significant but manageable quantity of ice. The second, more powerful wave of rain struck the city in the early morning of 22 December.

Utility poles and tree branches collapsed under the weight of the thick ice accumulation. At the height of the storm over 300,000 Toronto Hydro customers had no electricity or heating.[7]

Toronto, Canada's largest city, was one of the hardest hit by the ice storm.

By 24 December, four days after the storm, 69,800 customers throughout the city were still without electricity.[6] Approximately 1,000 people spent Christmas Eve in the warming centers. On 29 December, Hydro One diverted its crews to assist Toronto Hydro to help restore power to over 6,000 people in the city who were still without power.

Unexpected problem:

This natural phenomenon severely affected the city. Many basement areas and other areas without natural light in multiple buildings in Toronto have been left in complete darkness due to power outages or the failure the safety lighting systems, endangering the evacuation of the people inside.

Solutions

A new problem arose : How can we find an alternative solution of signaling through light fixtures the escape routes from dark closed spaces and how can we visually point out in a total darkness situation elements in the building structure that must be bypassed during the evacuation (support pillars, corners) or must be traveled in a certain direction (stairs, access ramps) ?

Technological solutions for this impasse exist, but are being used in other applications : interior decorations, entertainment industry, exploration research and military industry .

Those possible alternative solutions are: phosphorescent elements and light-stick items (chemical light tubes)

We will analyze how and if we can implement these technologies through smart design on a large scale for the emergency evacuation paths.

3.1. Chem-light

A glow stick is a self-contained, short-term light-source. It consists of a translucent plastic tube containing isolated substances that, when combined, make light through chemiluminescence, so it does not require an external energy source. This type of light is continuous, cannot be turned off and can be used only once.

Chemical light (chem-lights) offer a type of punctual light of short duration (a few hours maximum), but sufficient to be able to guide the user towards the exit or to explore a dark area (in the case of military uses, speleological, archaeological research, a.s.o.).

The major disadvantage of this technology if we try to consider it for widespread use in enclosed spaces is that it emits light for a short period of time, after which the tube (the chem light container) becomes inert and in order to reactivate the light we must replace the entire amount of chemical substances that create fluorescence through the chemical reaction between them.

Because of this major inconvenience it will be very difficult to create a viable solution that can be implemented at large scale in order to offer alternative light solution for the emergency escape routes in public or private buildings.

But still, the fact that this type of light source does not require an external energy source in order to work is notable and worthy of further investigation and research.

3.2. Phosphorescent elements

The solution with phosphorescent elements is very interesting and it was the solution I proposed at the request of the Arc Condominiums Management Board after the frozen rain phenomenon in Toronto 2013 have affected the building.

Phosphorus, extremely unstable and reactive in its natural state, can be included in glass or plastics and those elements can be used to outline the volume and the edges of an interior space in case of total darkness with lines and surfaces that glow in the dark.

The phosphorescent elements contain photo-luminescent pigments that absorb and store energy from appropriate artificial lighting and sunlight and they can undergo the process of being recharged with light repeatedly.

Appropriate artificial lighting means any light source that emits sufficient energy in the visible blue or invisible UV portion(s) of the electromagnetic spectrum, or both.

Through smart design we can compensate the fact that those phosphorescent elements have less light power than what is required by law for the standard emergency lighting systems, especially if we take into consideration the fact that in a total darkness environment even a less powerful light source is very visible and it is the only element that we will notice from the entire space around us. If one element is not highlighted by light and it is in the path of our emergency exit route, let's say it is pillar or a couple of steps, or a threshold - we will not see it in the dark , we will hit it or we will stumble on it and this will endanger our health and our success in exiting fast and safe from the building in a disaster situation.

Let's see what photoluminescent elements are available on the market today and what is the difference between them.

3.2.a. Phosphorescent coatings and stickers

- **"Glow-in-the-dark" coatings** contain photo-luminescent pigments mixed in epoxy or acrylic liquid stains.

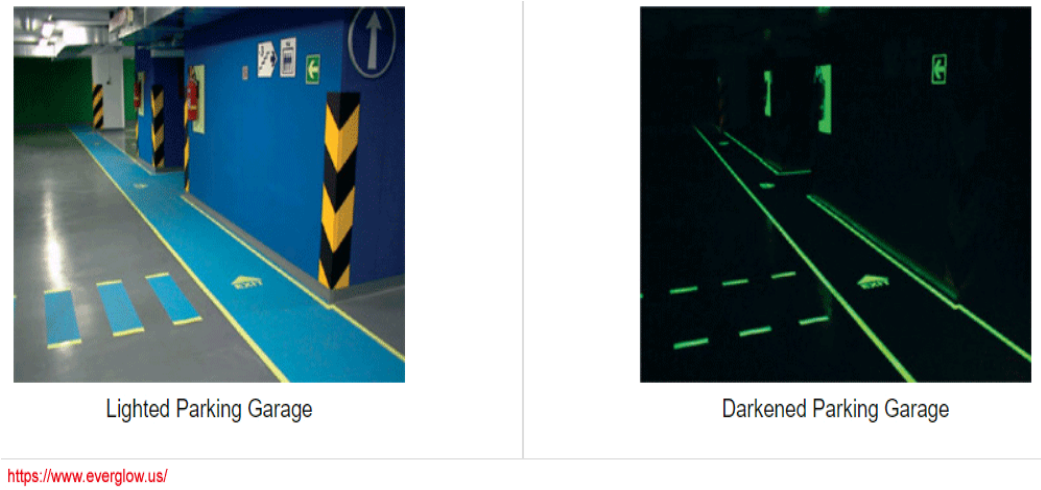


Fig. 9. Photo-luminescent epoxy coating
Source: *https://www.everglow.us/*

Reading through the technical data sheets that some of those manufacturers provide we will see that the luminous performance is quite impressive.

The coatings and stains have unfortunately a short life spam as they can sustain chemical damage from cleaners, thinners, clear coat or other paints, process chemicals, process fumes or environmental damage such as acid rain. If intended for horizontal surfaces people will step on like emergency exit paths it can sustain mechanical damage as well.

We also have to read carefully the hazard identification warnings, as most of those stains can cause serious eye irritation, skin irritation, allergic skin reaction and they are toxic to aquatic life with long lasting effects.

- **Phosphorescent stickers** are manufactured using a very thin layer of the same photo-luminescent pigments that absorb and store energy from artificial lighting or natural light.

More and more manufacturers worldwide are producing a wide range of phosphorescent elements like stickers, signs, markers, films, and tapes that can be glued to the walls, floor, stairs and exit doors.

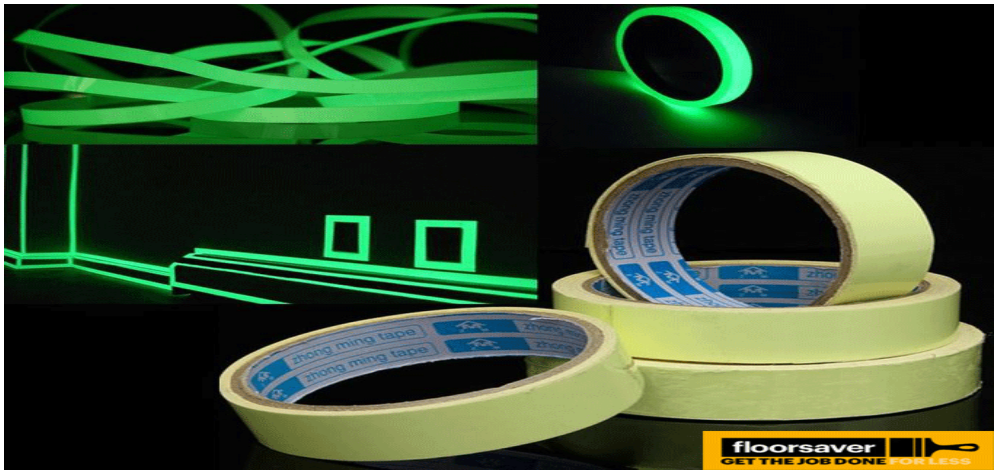


Fig. 10. Photoluminescent tape
Source: *https://www.floorsaver.co.uk/*

Those elements can be glued on any building element, part of the construction, furniture or equipment that can be an obstacle on the emergency escape route and can inflict injury or slowing egress during an emergency.

All those building elements need to be highlighted in order to avoid confusion that will slow an evacuation:

- Stairs and Ramps to clearly and safely show beginning, course and end.
- Handrails must be visible from the top and must show the course of the stairs
- Landings to show the leading edge (step landing) and perimeter of the exit path

Fig. 11. EverGlow "glow in the dark" signs, markers, films, and tapes for emergency exit paths markings
Source: *https://www.everglow.us/*

Luminaire Type	Minimum Charging Illumination	Maximum Afterglow Duration	Minimum Color Temperature	Lighting Industry Nomenclature
Fluorescent	1 ft-c	90 minutes	4,000 K	cool white
Metal Halide			4,000 – 4,500 K	
Mercury-Vapor			3,500 – 4,000 K	
LED (blue LED with phosphor)			2,700 – 4,500 K	soft or warm white to bright or cool white
Halogen			2,700 – 3,000 K	soft or warm white to bright or cool white
Incandescent			2,700 – 3,000 K	
Sodium-Vapor	does not reliably charge SrAl pigments		1,800 - 2,700 K	warm white
Neon			various	various

https://www.everglow.us/

Fig. 12. EverGlow "glow in the dark" signs, markers, films, and tapes technical information
Source: *https://www.lelong.com.my/*

3.2.b. Phosphorescent mosaics

Phosphorescent mosaic is manufactured using recycled glass that incorporates photo-luminescent pigments that absorb and store energy from appropriate artificial lighting or sunlight.

This type of mosaic has a high resistance to wear and have a glow time of **6 hours**, longer than the luminescent stains or tapes, due to the fact that the mosaic tiles are much thicker so they can incorporate a bigger quantity of photo-luminescent pigments per msq.

Phosphorescent mosaic can be placed on any surface of the building, on the floor, on the walls, on the stairs, it is as strong and reliable as any type of glass mosaic, it can be easily cleaned,it is chemical resistant, stain resistant, water resistant, frost resistant, it is not toxic, non flammable and its luminescence will not fade in time.

It also comes in white color (emitting white color glow), allowing a better color integration in any interior color scheme design and color pallet.

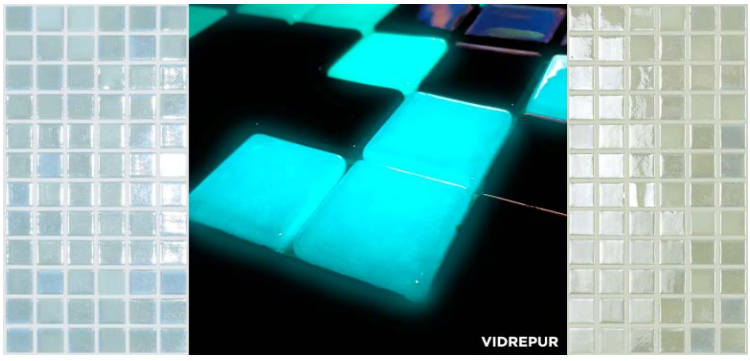


Fig. 13. Vidrepur luminescent glass mosaic tiles
Source : *Monica Frangulea*

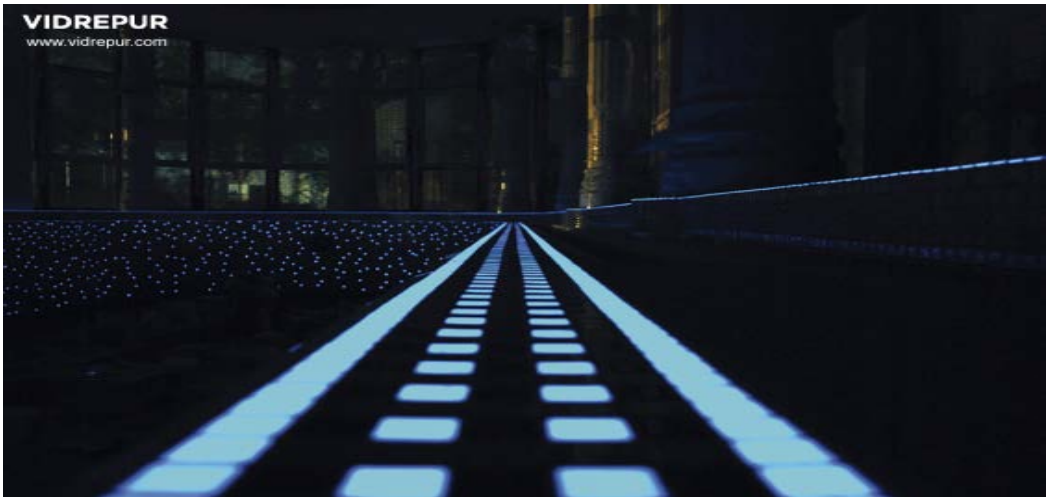


Fig. 14. Vidrepur luminescent glass mosaic tiles
Source : *https://vidrepur.com/en/*

3.3. Case study - Arc Condominiums

We will see now an example of such a project that I have done in 2014, after the frozen rain phenomenon affected Toronto in the winter of 2013.

I was requested by the Arc Condominiums Management Board to give an alternative solution of signaling the emergency exit paths in the entire building.

Arc Condominiums is a massive high-rise building of over 200 condo units,16 floors high, with 4 underground levels, interior pool, spa, gym, conference rooms and 5 emergency exit stairs.

Fig. 15. Arc Condominiums Building – Toronto
Source: *Toronto Real Estate Guide, The Nikolay & Tatiana Real Estate Team. Sutton Group- Admiral Realty Brokerage*

During the terrible ice storm, an elder person living in the building went to the storage unit she had in one of the underground levels of the building when a total power outage occurred and the emergency light system did not work. So she found herself in a pitch-black situation in an open interior space over 100m long and 30m wide full with over one hundred concrete pillars that she could not see. Actually she could not see anything and she was able to find her way out of the basement and up the stairs using only the screen light of her cell phone. It took her 2 hours to do that. At a exterior temperature of -15 degrees, the interior temperature of the space she was in started to drop rapidly, putting her health and eventually even her life in great danger.

The reasons why the emergency exit lighting system did not work are immaterial at this point and we have already seen before what causes can lead to this type of malfunction.

Taking in consideration the size of the building, the solution tried to use a minimum amount of luminescent glass mosaic tiles in order to reduce costs as much as possible.

The remarkable aspect of this type of solution is that it involves only an initial investment and it does not require any financial effort after, as it will recharge by itself in perpetuity just from the artificial light that is used on the interior circulated areas that works regularly all the time.

The solution propose narrow stripes of mosaic tiles to be placed on every sharp edge of structural pillars, wall corners and also as a belt placed 1m high on all peripheral and interior walls of the enclosed public spaces and exit paths.

On the floor there can be a central stripe 60cm wide or more that have black mosaic flash marks and other symbols that can help guiding the people on the paths towards the nearest exits. The exit doors in some areas will be fully covered with luminescent glass mosaic so as to be visible from a big distance.

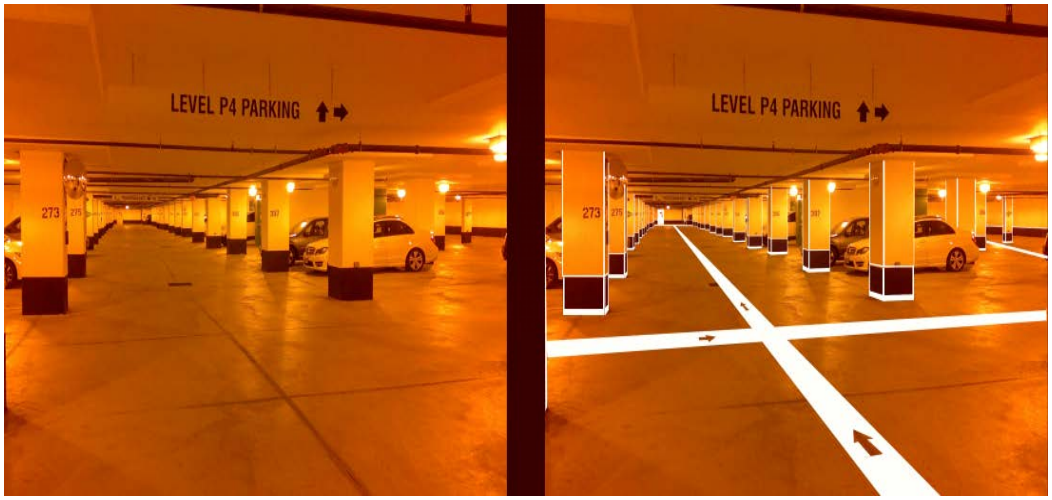


Fig. 16. Underground parking and tenants storage units area level -4 Arc Condominiums Building – Toronto
Alternative emergency signaling system using luminescent mosaic - regular light system working
Source: *Monica Frangulea*

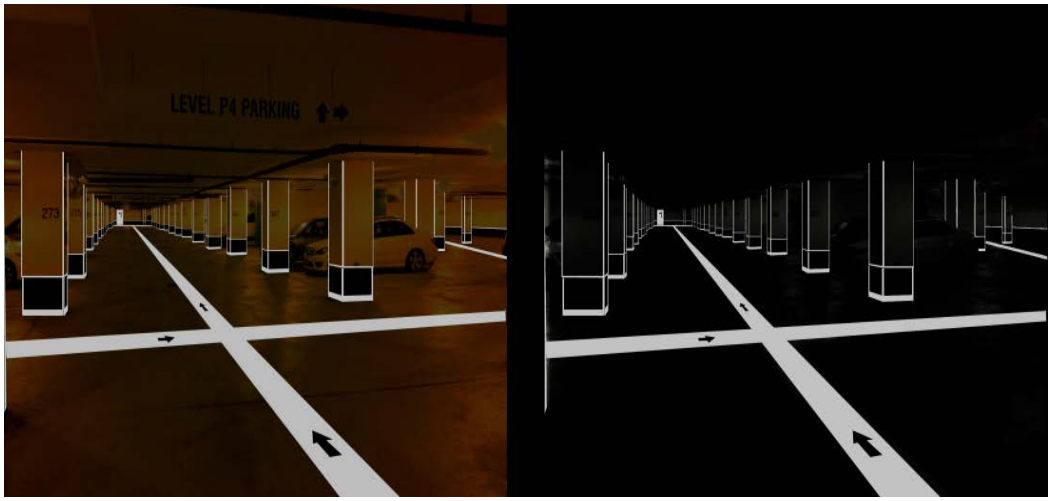


Fig. 17. Underground parking and tenants storage units area level -4 Arc Condominiums Building – Toronto
Alternative emergency signaling system using luminescent mosaic - only emergency light system working - electric power outage and emergency light system not working
Source: *Monica Frangulea*

For the emergency exit stairs the solution is simple, highlighting every single step with an horizontal stripe placed on the top of the under-step, a continuous stripe on the edge wall following the stair profile and a stripe at the railway level :

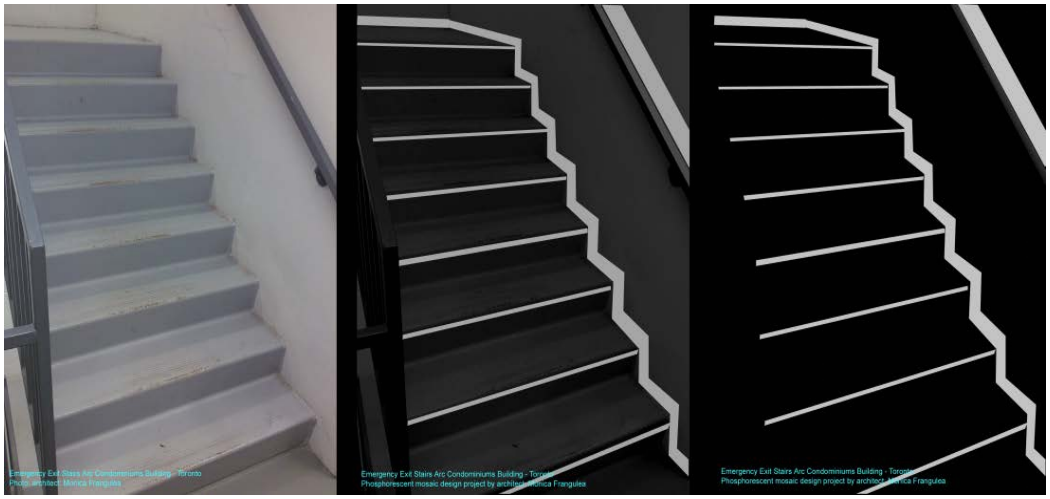


Fig. 18. Emergency exit stairs Arc Condominiums Building – Toronto
Alternative emergency signaling system using luminescent mosaic - only emergency light system working - electric power outage and emergency light system not working
Source: *Monica Frangulea*

The total cost of implementing this solution (materials and labour) for the entire building proved to be smaller than the cost of one replacement of the batteries for all the emergency light fixtures (that needs to be spent every 4 years, as explained on the previous chapters).

4. Conclusion

Photo-luminescent elements represent a viable alternative solution as a safety feature that can be implemented through smart design on a large scale for the emergency evacuation paths and not only and this family of products deserves further analysis and future development effort, in order to create better products that can be used in the construction industry of the future.

Acknowledgments

This presentation would not have been possible without the precious collaboration and cooperation of Dr. Eng. Mihai Husch whose support is gratefully acknowledged and Professor Dr. Arch. Cristina Olga Gociman that enriched my awareness about disaster hazard.

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Industrial research and experimental development vehicles with brushesless electric motors powered by lithium-ion batteries for personal transportation-gentle electric

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Abstract

The paper aims to present a Romanian company that currently produces a wide range of electric vehicles: electric scooter, electric transportation vehicle for disabled people, electric bicycle and electric kick scooter. Nextrom predicted that in any field, the future requires innovation and it is necessary to develop projects that respect this trend of offering high-performance products with unique qualities, which not only meet an existing demand, but create the desire to have more. Through the projects implemented by ARIES OLTENIA and PLIMM CALAFAT, the creation of a network for electric bicycles in the entire cross-border area Romania-Bulgaria began in order to achieve an improved individual mobility of sustainable transport. In a globalized economy where life is moving so fast, most consumption habits revolve around public transport, common housing and common work spaces. This research was conducted by the University of Craiova – Faculty of Mechics, SC PARC INDUSTRIAL CRAIOVA SA and The Ecological Initiative and Sustainable Development Group for the Preliminary study on the industrial research and experimental development vehicles with brushesless electric motors powered by lithium-ion batteries for personal transportation-gentle electric, but also for the construction of the industrial hall and endowment with the necessary equipment for the production of vehicles powered by brushless electric motors powered by lithium-ion batteries for passenger transport-GENTLE ELECTRIC.

Keywords: *GPS and online tracking, electric kick scooter, ridesharing, docking stands.*

1. Introduction

Established in 2010, S.C. Nextrom Industries S.R.L. wants to create a range of products generically called "GENTLE ELECTRIC" - the products represent vehicles for transporting people with electric traction. These products are intended for the general public use in current activities. Products include: electric scooter, electric transportation vehicle for disabled people, electric bicycle and electric kick scooter. Given this fact, NEXTROM INDUSTRIES SRL was part of the South-West Oltenia Automotive Competitiveness Pole by carrying out the following 2 projects:

- the research-development project, involves the improvement of the electric motor execution technology, the improvement of the electric motor command and control system, the improvement of the electric vehicle energy management system, the improvement of the electric vehicle self-diagnosis system, the improvement of electric vehicle kinematics and dynamics. as well as improving the technology of execution of electric vehicles.
- the investment project, which involves the realization of a business infrastructure by purchasing a land, the construction of a production hall, the endowment with the necessary equipment for the production of electric vehicles, of conference and exhibition spaces.

The general objective of the first project "Industrial Research And Experimental Development Of Vehicles With Brushesless Electric Motors Powered By Lithium-Ion Batteries For Personal Transport-Gentle Electric" is represented by the realization of industrial research for electric vehicles with brushless motors, to improve their capacity and their efficiency. The total value of the project is in the amount of 1,888,651.75 Lei.

The second project "Construction of industrial hall and endowment with the necessary equipment for the production of vehicles powered by brushless electric motors powered by lithium-ion batteries for personal transport-GENTLE ELECTRIC" has as general objective: the consolidation and development of the business infrastructure of the pole of competitiveness Automotive Sud-Vest Oltenia, by ensuring the material base in order to develop the production capacity of the applicant within the competitiveness pole, by using new technologies, able to compete on national and international markets; achieving the general objective will determine the increase of Romania's competitiveness within the European Union and will create the premises for a better integration of the national economy in the European economy. The total value of the project is in the amount of 21,464,506.56 Lei.

The specific objectives of the project are:

- Acquisition of land with an area of 10,940 sqm at the time of approval of the investigation project;
- Construction of a business infrastructure that will be used by the members of the pole until the end of the project implementation, in the built area of 5902 sqm;
- Increasing the degree of technology by purchasing 85 technological equipment by the end of the project implementation;
- Creation of 62 new jobs by the end of the project implementation;

- Increase in turnover by 20% in 2 years from the completion of the project;
- 60% of the production obtained from the investigation will be destined for export.

2. Results and Discussions

The relevant results of this project are the 5902 sq m Hall built and its connection to water supply, sewerage, electricity and gas. Another relevant result is the acquisition of a number of 152 equipment and 1 software.

The implementation of the project brought benefits for the company that diversified its current activity, by creating an infrastructure for the production of electric vehicles for personal transport, but also by improving the production process of these vehicles resulting from the research-development activity.

The factory is to produce, for sale, light electric vehicles and motors for light electric vehicles.

The dictionary definition is: A moped is a vehicle with two, three or four wheels, whose maximum construction speed does not exceed 45 km / h and which is equipped with an internal combustion engine, with spark ignition, with a cylinder capacity not exceeding 50 cm^3 or electric, with a rated power of not more than 4 kW.

In the assembly and packaging flow, light electric vehicles include:

- Mechanically machined parts
- Painted parts, both metal and plastic.
- Electric motors tested
- Components purchased from sub-suppliers that go directly into light vehicles: batteries, mirrors, brakes, horns, tire wheels, etc. The components come to the assembly stations with the electric bus, brought from the component warehouse.

Nextrom predicted that in any field, the future requires innovation and it is necessary to develop projects that respect this trend of offering high-performance products with unique qualities, which not only meet an existing demand, but create the desire to have more.

Looking at things in this way, we have managed to create products that adapt to the growing demands of our users and give part of the vision of all those who use them.

- Quality is the element on which we base our activity, being paramount in making products appreciated worldwide. Quality is reflected both in the materials used and in all production processes, from design to service provided to each customer.
- Excellence - translated by the refusal to make compromises from the assumed quality proposal, working with experts in the field, always looking for development opportunities and maintaining the status of reference producer.
- Professionalism is another essential aspect, a characteristic of each team member and support of the idea of quality.

- Passion - the Gentle Electric team is an enthusiastic, passionate about the chosen field, in a permanent process of research, development and improvement.

Fig. 1. E-twow electric kick scooter
Source: *https://e-twow.ro/*

ELECTRIC BIKE - Gentle Electric - is an extremely reliable and easy to use product offering advanced technical features.

Through the projects implemented by ARIES OLTENIA and PLIMM CALAFAT, the creation of a network for electric bicycles in the entire cross-border area Romania-Bulgaria began in order to achieve an improved individual mobility of sustainable transport.

For these projects were provided a number of 120 Electric Bicycles with built-in GPS and online tracking, as well as 35 pcs - Charging stations made of a metal panel with a diameter of 600X800 mm, fixed on a metal support, 5 built-in electrical outlets in device with overcurrent protection.

RideSharing E-twow system

The sharing systems for electric vehicles, in our case foldable electric scooters model E-twow, came in order to reduce carbon emissions and ease congestion on public roads, while reducing travel costs for users.

3. Conclusions

In a globalized economy where life is moving so fast, most consumption habits revolve around public transport, common housing and common work spaces. According to existing statistics, transport accounts for 24% of global CO2 emissions. With fewer vehicles on our roads, carbon dioxide levels will be reduced, giving us cleaner air and a healthier environment, which is why E-twow, after the introduction of the foldable electric scooter as a mode of transport, now presents a solution of RideSharing suitable for our cities.

The model we propose is a socially responsible and sustainable business model, coming to meet the needs of the community. The RideSharing E-twow system

provides electric scooters, a docking and charging stand for them, so that, after use, the user parks the scooter in a specially designated space, without disturbing pedestrians or other traffic participants. Through an intuitive application, E-twow RideSharing, now the problem of urban transport is simplified, and E-twow docking stands bring elegance to the system and help to decongest traffic while avoiding sad images of electric scooters parked or abandoned in completely unsuitable areas.

The RideSharing E-twow system was successfully implemented together with the town halls of Timișoara, Oradea and Suceava, being now an integral part of the public transport systems in these cities. You can also use an E-twow scooter in the sharing system in Norway, Malta, Serbia, Slovenia, Croatia, Turkey. Many corporations in Romania and abroad have purchased similar systems with E-twow scooters used in closed circuit mode by employees and their collaborators to replace the use of cars in short distances (10km).

With E-twow RideSharing, people benefit from using a private vehicle, without the costs and responsibilities of ownership. We can use the vehicle whenever we want and pay only for the trips we make, without worrying about maintenance, repairs and insurance.

Fig. 2. E-twow docking stand
Source: https://e-twow.ro/

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Smart mobility - Challenges for mobility policies and spatial planning

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Abstract

Smart mobility - Connected, Autonomous, Shared, Electric (CASE) mobility – it is shown to become a complex landscape of new transport technologies, infrastructures, services and systems based on Information and Communication Technology (ICT). Smart mobility will be generated, will serve and will be contained by smart urban systems, and this mechanism of mutual influences have to be well managed both through smart spatial planning and through specific smart mobility policies, in order to maintain the balance between accessibility and quality of urban life requirements. In the context of intense concerns regarding the evolution of smart mobility and its holistic effects, the paper proposes a synopsis of the potential social, economic, environmental, spatial impacts of emerging Intelligent Transport Systems (ITS), based on which two objectives are met: 1. drawing guidelines for smart mobility policies design, and 2. identifying the main categories of foreseeable spatial impacts of smart mobility.

The study builds on the conclusions of the author's documentation and research, individually and in national and international projects. There is a forward-looking approach, starting from a synthesis of current knowledge on smart mobility, based on information selected by the triangulation method. The paper concludes on the features of ITS-oriented mobility supply, on the related mobility behaviors, and on both positive potential impacts, which should be developed and encouraged by ITS policies and negative potential impacts, which should be strongly limited by these future policies. There are also identified the main categories of envisageables spatial - functional urban effects and transformations generated by ITS - at the level of the road network, street morphology, architectural-urban programs, urban structure - whose further analyze and understanding is mandatory for preparing cities to properly respond to the challenges and demands of smart mobility, while maintaining and even enhancing the quality of urban living.

Keywords: *Intelligent Transport Systems (ITS), mobility policies for its, smart city, connected autonomous shared electric vehicles (CASE-V).*

1. Introduction

The evolution of humanity faces a new paradigm shift – towards the "smart" human development - triggered by the disruptive evolution of science and technology, and particularly by that of the Information and Communication Technologies (ICT) - 5G technology, large databases (Big Data), Internet of Things (IoT). This new challenge occured in the context of the strong concerns for environmental protection, for curbing and limiting climate change by decarbonising the economy and the mobility.[16] Intelligent human development thus preserves the logic of sustainability, further capitalizing on the performances and efficientization announced by the digitization and robotization of activities. This new, global „*smart development*" paradigm triggers changes of all the planning models specific to various fields, leading, for example, to "smart mobility" and "smart city" new planning approaches.

A *smart city* will be an urban territory (urban area) that will integrate complex information and communication technology (ICT) able to collect and manage large amounts of data, to connect many systems and to ground real-time responses so as to enhance the lives of citizens. "IoT sensors, video cameras, social media, and other inputs act as a nervous system, providing the city operator and citizens with constant feedback so they can make informed decisions." [8]

Smart mobility is about to become an ICT-based, multimodal, sustainable, optimized urban mobility system within the smart city, interconnecting many different types of ITS through smart management. New, specific, mobility policies are to be developed. [11],[17], [25],[37]

In the context of intense concerns regarding the evolution of smart mobility, this paper identifies *a synopsis of the positive and negative potential impacts of emerging Intelligent Transport Systems* (ITS): *spatial, social, economic, environmental,*. Based on it, some general principles for designing *ITS-oriented mobility policies* further adress bowth the *positif potential to be harnessed through „pull", incitative measures* and *the negative potential whose manifestation should be mitigated through „push", dissuasive measures*. The main categories of foreseeable spatial impacts of smart mobility are also identified.

2. The research method

The study builds on the conclusions of the author's documentation and research works, individually and in national and international projects, and particularly on that related to WISE-ACT, COST project. There is a *forward-looking and thinking approach*, relying on the current knowledge on smart mobility. This general state of the art framework was achieved, using the triangulation method, through the analyze of three categories of information: theoretical and research studies - *reports and predictive studies on smart techology advancements* [2],[3],[6],[10],[15],[22],[24],[26],[27],[28],[29],[35],[36], [39], [40],[47], *surveys* on relevant public perception [1],[12],[13],[21],[23],[44],[48] and *multidisciplinary discussions on technical and planning issues* (with transport and environment engineers, urban planners, sociologists).

3. Intelligent transport systems - potential features and impacts

After several decades of quasi-linear evolution, in the recent years, the transports experience a disruptive evolution triggered by the accelerated development of ICT: *new transport technologies that integrate ICT* - autonomous and connected vehicles (drones, autonomous cars, flying cars with / without driver), intermodality and interoperability - *new types of ICT based mobility services* (on-demand transport, sharing schemes - car-sharing, bike-sharing, scooter sharing, ride-sharing, integrated transport services - MaaS, etc.), and even *challenging, new, spectacular transport systems* (such as Urban Air Mobility, hyperloop). [10],[14],[15],[18],[41],[50].

These evolutions come with a huge but yet partially unpredictable potential to change the mobility landscape in terms of *urban mobility supply* (infrastructure, fleets, services), *travel behavior* (modal options, travel characteristics) and also in terms of *urban, environmental, social, economic, impacts*, *both positive and negative*. In the frame of the current knowledge, through a looking-forward approach, it was identified *a synoptic table of the foreseeable potential impacts generated by the new characteristics of Intelligent Transport Systems - autonomy, connectivity, sharing and electrification*. (Table 1), [4],[5],[37], [42], [45],[46],[50]

Table 1. The sinoptic of the potential impacts of the Intelligent Transport Systems

SMART MOBILITY-ITS features	**MOBILITY BEHAVIOUR** Potential trends positive ☐ negative ☐	**Potential impact(s) on** positive ☐ negative ☐		
		Mobility	**Urban space**	**Social, economic, environment**
SHARED (car-sharing, bike sharing, scooter sharing, ride-sharing)	**Mobility behaviour less based on personal car use and reorientation towards shared-vehicles** *(requires social acceptability)*	▪ **Lowered motorization rate** (no. motor vehicles / 1000 inhabitants)	▪ **Less urban space and less built surface consumed by parking**	▪ **Lower costs of personal car use** (elimination of costs related to their ownership) ▪ **Limitation of social exclusion / discrimination related to transport**
Diversified shared fleets (with different types of vehicles); Customized transport	**Differentiated choice and use of vehicles**, depending on the travel purpose and needs, on the passenger's number, etc.	▪ **Optimized, efficient transport**	▪ **Less road space consumed by traffic and its improved (re)allocation**	▪ **Lower / optimized costs of individual travels** ▪ **Lower negative environmental impact**

AUTONOMY (& robotization) – Self-driving cars - level 5 (SAE International, [43])	**More car users (children, the elderly, people without a driver's license, blind people, etc.) -** *Increased demand for car use* **Higher travel time budget** (as a result of using travel time for other activities as well)	▪ **Higher volumes of individual motorized travel** ▪ **Increased commuting in terms of distance and traffic volume** (due to the use of travel time for other activities) ▪ **Increased traffic congestion**	▪ **Higher urban space consumed by traffic** ▪ **Low quality of public space** *or* ▪ **Efficient use of road space** (through automatic driving and parking)	▪ **Economic benefits** - travel time saving - (many) use of travel time for other activities ▪ **Environmental benefits** through automatic eco-driving (including energy saving functions) ▪ **Limiting social exclusion related to transport** ▪ **Decrease of accidents & fatalities**
Transport on demand - Possibility to "call a car" in any location, at any time (with smart devices)	**Mobility behaviour less oriented on personal car use**	▪ **Lower motorization rate of the population** ▪ **Flexibility and customization of transport services** ▪ **Reduced "last mile" related issues**	▪ **Improved accessibility to transport within low-density peripheral and periurban areas**	▪ **Increased users' satisfaction with public transport systems**
CONNECTI-VITY	**New social culture and practices related to IoT**	▪ **Connection and transfer of information, in real time**, with other vehicles and other elements of the environment, **interoperability** ▪ **Optimized traffic management –** lower traffic congestion	**Traffic management adapted to the situations of the urban areas - pollution, congestion, etc**. (multimodal variants – MaaS, bypass routes, etc.)	**Benefits deriving from the optimization of transport systems** (social and economic, related to time saving, environmental benefits related to reducing pollution, etc.)
		▪ **security issues - multiple vulnerabilities**		

ELECTRIC TECHNO-LOGY	**Gradual replacement of the private vehicles on fossil fuel with electric vehicles (**supported by incentives and deterrents)	**Decarbonization of mobility**	**Integration in the territory and in the public space of the infrastructure for ICT and for charging electric vehicles**	**Low economic and environmental costs** (if green energy is used)

Source: *Synthesis made by the author*

Concluding, the new features of Intelligent Transport Systems bring a significant potential for positive impacts:

- *on mobility behavior(s)* (less oriented on personal car use, more oriented on shared-mobility, public transport, lower car ownership),
- *on urban mobility* (optimized and efficientized transport, through improved traffic management and interoperability, travel time savings, flexible and customized transport, modal split restructured in favor of a more convenient and attractive public transport, including sharing systems, fewer and lower traffic jams, reduced "last mile related issues – new door to door accessibility , lower motorization rate, new forms of accessibility – „urban aerial accessibility")
- *on urban space* (efficientized use of public space – its lower consumption by moving or stationary cars, improved ambience through contextualized mobility schemes, improved accessibility to transport within low-density peripheral and peri-urban built areas), [19], [20], [49]
- *economic* (travel time savings, multi-use of travel time, reduced costs of private use of cars by increasing their utilisation rate within shared fleets)
- *social* (mitigation of social exclusion related to accessibility and mobility, through transport on demand and autonomous vehicles, decrease of accidents and fatalities rate, increase of users' satisfaction with public and shared transport)
- *environmental* (reduced pollution, curbed and limited climate change – decarbonizing urban mobility [16])

At the same time, as shown in Table 1, ITS new features might also generate negative impacts, especially related to the use of autonomous, self-driving vehicles (level 5 robo-cars). That new type of driverless technology would be additionally used by categories of people who previously did not have the opportunity to use a car independently (children, elderly, people without a driver's license, blind people, etc.). That could lead to an increase of the individual motorized travels and thus of the traffic volume, with higher space consumption and pollution.

Also, the possibility to use the travel time for other activities as well could lead to the increase of daily travel time budget, of daily commuting journeys length, and thus of the traffic volume. It could also lead to an effect of increased urban sprawl, in a larger and less dense periurban area, with lower potential to be well served by public transport.

Important concerns are also related to the vulnerabilities of computerized transport systems, such as cyberattacks.

Harnessing the positive potential while limiting as much as possible the expressing of the negative potential can be achieved only through intelligent policies for smart mobility.

4. Policies for smart mobility - Benchmarks

4.1. From city to metropolis. From plans to policies for urban mobility

In the last decades (since ’60 in western countries, since ’90 in eastern, former communist countries), there has been a spectacular evolution of urban settlements, characterized by demographic and territorial growth. „Today, 55% of the world’s population lives in urban areas, a proportion that is expected to increase to 68% by 2050. Projections show that urbanization, the gradual shift in residence of the human population from rural to urban areas, combined with the overall growth of the world’s population could add another 2.5 billion people to urban areas by 2050(…). By 2030, the world is projected to have 43 mega-cities with more than 10 million inhabitants, most of them in developing regions.” [29]

Urban territories have transgressed administrative boundaries of main *cities* and have evolved from single Territorial Administrative Units to urban systems that we now call "*Functional Urban Areas*" (FUAs) or *metropolitan areas*. FUA is a larger area of daily life, calibrated by the daily commuting flows between a main city and its surrounding localities that it influences and polarizes. This phenomenon of urban expansion has been triggered by the spectacular evolution of transport systems (especially by the exponential increase of automobility and by the rise of vehicles speed performance). [32]

Metropolitan travel systems achieved a complexity that could no longer be managed through the caduques principles, models, methods and tools of the classic "traffic planning". This approach became obviously inadequate, seen the high magnitude and unsustainable trends of the motorized traffic negative impacts. Since the ‘70s, with the adoption of sustainable development logic, mobility approach and planning also stepped towards a new paradigm, that of *sustainable mobility*. This involved complex changes of principles, methods, tools, models. (Fig. 1), [32]

A general, major change has been the shift from travel systems planning through *short-term sectoral approache*s, such as "traffic plan", "transport plan", "traffic study", to *integrated, multidisciplinary planning*, based on a *long-term vision*, which before setting action plans builds *sectoral mobility strategies and policies aimed at creating a multimodal mobility offer, for the (re)model of mobility behaviors in the logic of sustainability.* This logic is mainly translated into two major specific objectives: 1. *reducing the ecological footprint of mobility* and 2. its “urbanization”, in the sense of its more *harmonious, contextualized insertion, in urban territories, tissues and spaces.* (Fig.1), [32]

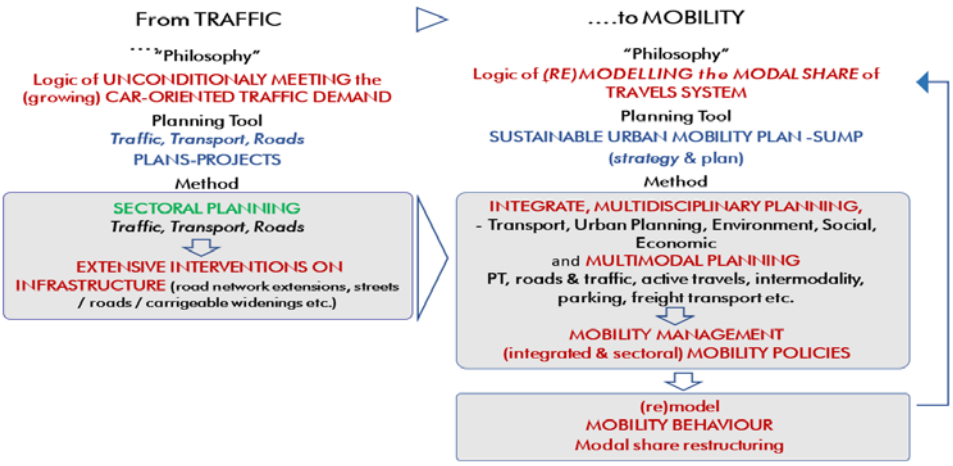

Fig. 1. Mobility paradigm change – "from Traffic to Mobility"
***Source*:** Negulescu Mihaela, Mobility Plans and Policies- master course, UAUIM

Also, mobility policies are no longer focused only on creating *"hard" offer* - infrastructure, fleets and transport services (which require significant investments) - but also identify ***"soft" measures*** – pricing and taxation, regulations, information campaigns etc. (which do not involve high costs). Both categories of measures are thought in a systemic way, coherently and convergently, in order to obtain *incentive effects* and *dissuasive effects*, through which the mobility behavior of the population can be influenced and channeled towards achieving the previously mentioned specific objectives. [32]

4.2. Smart Mobility policies

As previously shown, ITS come with new features and new challenges, with a huge positive potential, but also with a potential for negative impacts (point 3). Appropriate specific planning and implementation frameworks (institutional, legislative, regulatory, financing) have to be developed for smart mobility policies - for Connected Automated Shared Electric (CASE) mobility. The new, smart transport technologies, systems and services have to be integrated so that their positive potential is effectively exploited, through incentives / pull mesures, and the evolution towards potentially negative effects, through dissuasive / push measures, is discouraged. (Fig.2), [38]

Based on the synoptic table 1, we can conclude that smart mobility policies have to build new mobility schemes and coherent packages of hard and soft measures (related to infrastructure, fleets, services, regulations, financing and business models etc.) aimed mainly at:

- Encouraging mobility behaviors based on the individual or in common use of shared vehicle fleets (public transport, car-sharing, bike-sharing, scooter-sharing, car-rental, ride-sharing), which would lead to a reduced motorization rate and a lower urban space consumption by parking. For the

individual use of shared vehicles, micro-mobility systems with small vehicles are especially encouraged.

- Encouraging transport on demand schemes, which would reduce dependence on one's owned car and could improve the accessibility of the low-density areas, poorly served by traditional, planned forms of public transport.
- Discouraging individual mobility with autonomous vehicles, for long-distance journeys, which could increase traffic volumes, traffic jams, and exacerbate the consumption of urban space by moving and stationary vehicles.

Smart mobility policies, acting as mobility behavior modelers, should also be designed taking into account the levels of acceptability, the perceptions and social expectations, the attitude of transport users' towards CASE schemes, that are identified through public consultations and surveys. [34]

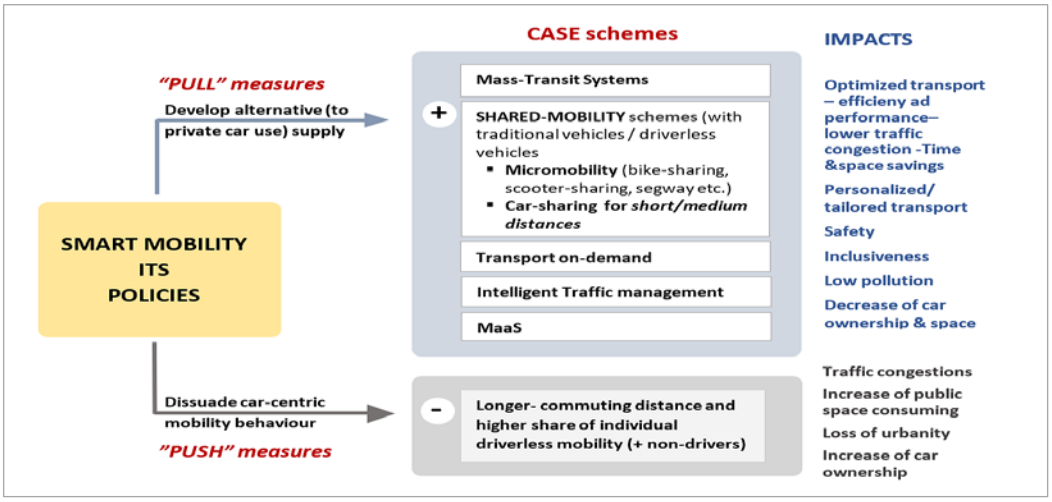

Fig. 2. Push&pull general approach of Smart Mobility policies – CASE schemes and impacts
Source: *the author*

5. Smart mobility in smart cities

Urban planning and design, in the broader logic of the "*smart city*", will also have to relate and to adapt to the new features of ITS, to deal with *new forms of accessibility*, with *new spatial requirements and potential impacts*, that are too little studied and understood yet. The *accelerated evolution of transport technologies* is in high contrast to the *inertia of urban settlements* which thus do not achieve adequate Automation-readiness', that can be defined as „the capability of making structured and informed decisions about the comprehensive deployment of CAVs in a mixed road environment". [7]. This could lead to an "urban shock" *when smart mobility systems will emerge within urban environments that are not ready to properly contain*

them, when the regulatory framework is not sufficiently prepared to manage the new technological reality. This might be comparable to the shock of the explosive grew of automobility, since '50s, that generated huge negative impacts, due to its poor management. Therefore, without delay, there is a need for prospective studies on *models of intelligent, non-conflicting, contextualized insertion of ITS in urban territories and spaces*. [9],[30],[42],[45],

Based on current knowledge and anticipative studies on the characteristics of emerging technologies (connected autonomous vehicles – aerial and terrestrial), several major directions for adapting cities to new transport models can be anticipated, in a forward-looking approach:

- *Integration of ICT intelligent infrastructure* (sensors, meters, 5G antennas, etc.) *in the urban territory and space* (regulations, locations, aesthetics) [39]
- *Remodeling of the road infrastructure*, taking into account both new functional requirements of the ITS, and urban exigencies [2],[3],[30], [33],[37],[42]:
- Reorganization of the *road networks* (hierarchy, connectivity, differentiation, specialization etc.)
- Reorganization of *streets morphology* (allocation and configuration of space) and *rules of their use* (regulations related to speed, priority of passage, conditioned access, use of curb space etc.)
- *Smart streets – streets that integrate the smart environment hypostasis*, (fig. 3)
- *New intelligent parking systems*, without driver, on street or off street, for classic vehicles and/or for self-driving and self-parking cars (more efficient in terms of space and time consumption, due to automated parking and reduced maneuvering space), with new architectural models an attention payed to their integration into the urban space and landscape.) (fig.4)
- *Integration of new intelligent mobility schemes* (shared fleets, driverless transport schemes) in urban territories - location, sizing, functionalities, design(s)
- *New urban and architectural programs related to ITS* (multifunctional hubs of shared fleets with shared use - shared mobility, heliports for drones, etc.)
- New regulatory framework and *(yet unregulated) models of urban aerial space use by the Urban Air Mobility ("vertical" mobility)*

At a structural level, urban territories will probably face challenges related to the tendencies of extension of daily life-territories (urban areas), due to the use of travel time budget also for other activities and also due to a larger digitalisation of jobs and public services.

The need for a better quality of urban living conditions the future ITS design, in terms of decreasing pollution and space consumption exigencies. Electrification of transport technology it is expected to meet the target of mobility decarbonization. For *limiting the consumption of urban space* by moving or stationary vehicles there is need for a large focus on *shared-mobility schemes*, *intelligent parking models* and on the *use of small vehicles for individual transport* (cars – fig. 4, bicycles, scooters,

segways, etc.). [19] A good example for the kind of small vehicles to be used in dense urban environments is the electric two-seat pod, with "robot wheels" named "city-car", designed at the Massachusetts Institute of Technology by the Smart Cities Research Group, lead by William J Mitchell. Hiriko Driving Mobility consortium built on that concept the prototype Hiriko Fold, a folding two-seat urban electric car. (fig.4).

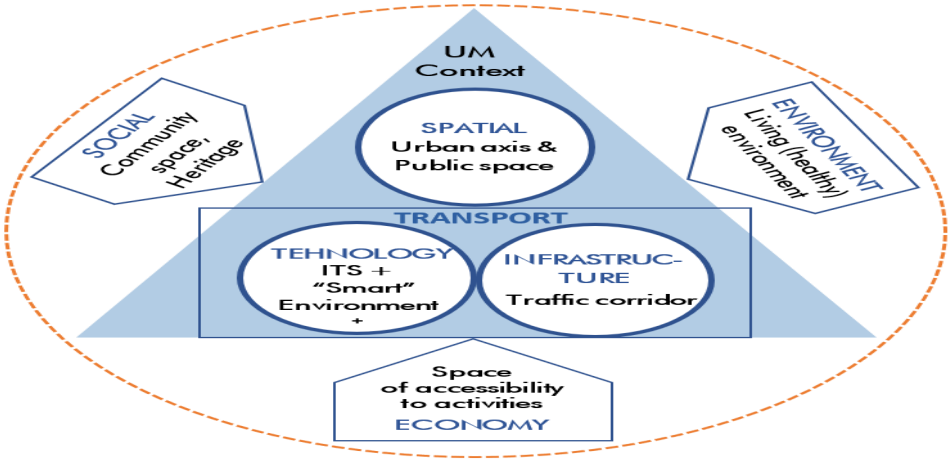

Fig. 3. Holistic planning of streets, integrating three hypostases: 1. Urban axis, community space and urban landscape, 2. Traffic infrastructure, 3. Smart environment for ITS
Source: *Negulescu, Mihaela, 2019, Smart Street reDesign- The first multidisciplinary student workshop in the field of urban mobility, in Romania - Research through project, IGLOO no 190/iun-iul 2019*

Fig. 4. Small vehicles: a) MIT's Stackable City Car, *Source: https://inhabitat.com/transportation-tuesday-mits-stackable-city-car/, b)* Stackable cars - Light weight L category electric vehicle that can be stacked together to gain space – to be developed in the Easily Distributed Personal Rapid Transit (ESPRIT) project, ***Source:*** *ESPRIT project http://www.esprit-transport-system.eu/*

6. Conclusions

For the deployment of new intelligent transport systems (vehicles, services, infrastructure) in the smart cities of the near future, beyond a whole specific ecosystem (legislative, regulatory, institutional, financing and business-models) that is to be organized, *smart mobility policies should be developed, so as to meet, in a balance manner*, *both accessibility and quality of urban living exigencies*.

The Smart city, as the physical container of the new forms of smart mobility, will also have to adapt to new spatial and functional requirements and change certain of its structural, morphological, configurative features. All these challenges require prospective, forward-looking approaches to achieve adequate "automation-readiness" and to avoid disfunctional eruption of the ITS in a not properly planned and managed context.

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The infosecurity polygon concept

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Abstract

In support of research/development in infosecurity in the Republic of Moldova, the PINFOSEC polygon is being implemented. The polygon will create the conditions and provide the necessary infrastructure and tools for conducting experiments/research/adaptations/developments, based on which practical recommendations will be elaborated and differentiated infomatics security (i-security) solutions will be proposed, taking into account the particularities of the republic. PINFOSEC concept defines basic objectives, determines functional structure, describes technological platform (SECIM), outlines SECIM modules and formulates principles of creating the system of infosecurity models (SIMOSI) for application as needed. SECIM modules will be implemented within the SIMOSI system, through simulations their characteristics will be researched, and further the afferent, depending on the case, i-security solutions will be developed to strengthen performances. Within PINFOSEC infospace, the INFOSEC website will be integrated. Its aim is to inform public administration institutions, economic agents, organizations and population about dangers, vulnerabilities, incidents, means and necessary actions of i-security and of other important aspects in the field. To begin with, the results of an incipient assessment of i-security state in enterprises/organizations/institutions (EOIs) are at the base of works within the polygon. These results are obtained by an

online survey using 24 indicators. According to this survey, the percentage of EOIs with high i-security performance for EOIs with over 500 employees is about twice as high as that for EOIs with up to 10 employees. It is estimated that PINFOSEC will significantly contribute to creating the necessary conditions for improving the i-security of EOIs and of population in the republic.

Keywords: *information security, infosecurity model, polygon functional structure, polygon platform..*

1. Introduction

Information is a strategic resource. Many parts of it are confidential (personal data, commercial secret, state secret). E-commerce is widely used, various online financial transfers take place, etc. Unauthorized access to such information, but also massive, targeted (as the case may be) misinformation of population, especially through Internet, leads to considerable losses, slowing down the pace of economic growth and population welfare. The estimates of International Monetary Fund [1] show that in 2015 they had losses due to cyber attacks approx. 32% of companies, and 18% are not sure that they did not suffer from such attacks. According to the impact, cybercrime ranks 2nd in various economic crimes [1]. Cybersecurity Ventures predicts cybercrime will cost the world in excess of $6 trillion in 2021 [2] that is approx. 4% of global GDP. If in proportion to global losses, then in the Republic of Moldova they will constitute, starting with 2021, over 8 billion MDL annually. IT frauds causes losses of 0.5-5% of the total expenditure of public institutions [3]. The survey in the field of informatics security (i-security), conducted in Moldova in 2017 [4], showed that all users who use informatics means (i-means) need at least general knowledge in i-security. At the same time, in the period 2005-2014, the share of group organized cyber-attacks increased four times, reaching approx. 80% of the total [5]. Respectively, cyber-attacks are becoming more sophisticated, and counteracting them - increasingly difficult, requiring deep knowledge and related research. Applying local i-security solutions only temporarily reduces the risks. Moreover, the appropriate solution implemented today may in a relatively short time become insufficient.

The increasing severity of cybercrimes and the rising complexity of cyber-attacks accentuate the importance of research/development in i-security. It is required an overall approach to i-security with dynamic adaptation to concrete situations. The paper is intended to describe general aspects related to the destination, purpose, objectives, requirements, structure and functionalities of the PINFOSEC i-security polygon, as well as the platform and tools for its creation. First, an early estimate of the state of i-security in the Republic of Moldova is presented.

2. Informatics security state in the Republc of Moldova

At the moment, Moldovan official statistical data that would reflect the degree of i-security in the republic are not known [6]. The survey (23 questions), realized in

2017 under the Erasmus + LMPI project [4], was focused on identifying target professions and training needs on informatics security in Moldova and not on assessing the degree of i-security in the republic. At the same time, the Republic of Moldova appears in some international evaluations in the field (for example, Global Cybersecurity Index, GCIv3, 2018/2019 [7] and National Cyber Security Index – NCSI 2020 [8]), that show a slightly more advanced degree of infosecurity in Moldova than the international average.

The first trial to estimate the i-security state in Moldova was done in 2020 (May 25 - June 20) by an online survey [6]. Research was focused on EOIs. Five categories of EOIs were defined according to the number of employees (very small - up to 10 employees, small - 11-50 employees, small-medium - 51-100 employees, medium - 101-500 employees and large - over 500 employees), and each of them distinguishes between ICT-EOIs (EOIs related to Information and Communication Technologies sector - ICT) and non-ICT-EOIs (EOIs not-related to ICT sector). So, in total there were 10 categories of EOIs. For the incipient infosecurity state estimation, 24 indicators were used in the survey. The set of indicators was determined based on respective international practice, including that described in [7-10], and some limitations. The survey results are described in report [6]. Graphs of the dependence of ICT-EOIs (%ICT-EOIs) and non-ICT-EOIs (%non-ICT-EOIs) percentage on 23 indicators (indicators 3-26) are shown in Fig. 1.

From Fig. 1, it can be seen that the ICT-EOIs percentage in i-security varies from 34.1% to 94.1%. Only at 34.1% of EOIs is ensured high i-security performance in terms of IPS/WIPS use at all perimeter nodes of the EOI informatics network (indicator 15) and, likewise, the use of IDS/WIDS at all perimeter nodes of the EOI informatics network (indicator 14 - 35.2%). These two indicators are critical (the least EOIs have high i-security performance) for both ICT-EOIs and non-ICT-EOIs. A low degree of i-security is also in terms of testing external and internal penetration to identify vulnerabilities and attack vectors on EOI informatics space (indicator 22 - 59.1%), the use, in sensitive cases, of secure dedicated computers (indicator 7 - 68.2%) and performing the i-security audit of new informatics applications/systems before implementation (indicator 12 - 69.3%).

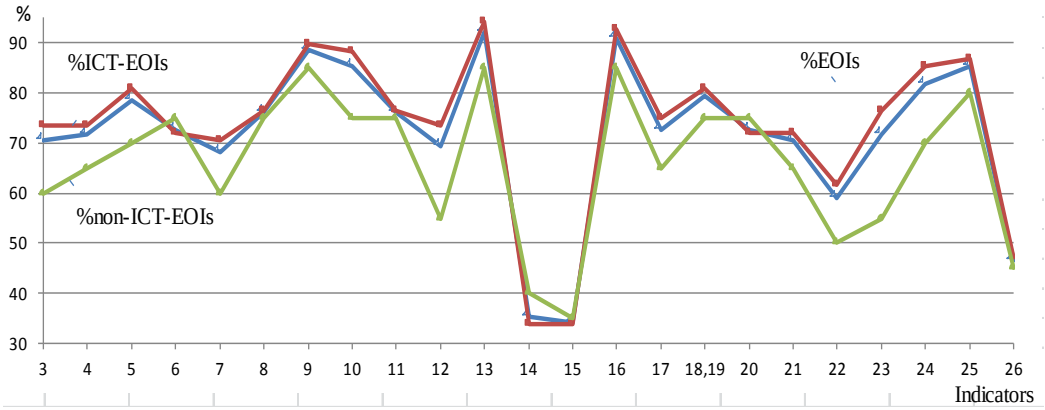

Fig. 1. The %EOIs, %ICT-EOIs and %non-ICT-EOIs dependence on indocators 3-26 [6].

The best situation regarding i-security is with the automatic creation of backups of sensitive information on secure servers (indicator 13 - 92.0%). A relatively high degree of i-security is also in terms of regulating access to resources (indicator 16 - 90.0%), the use of VPN (indicator 9 - 88.6%), the use of firewalls (indicator 10 - 85.2%) and informing employees about the implications of i-security, including possible malicious software (indicator 25 - 85.2%). Also, the unweighted average value of %EOI, %ICT-EOIs and %non-ICT-EOIs on the 23 i-security indicators constitutes:

- for EOI - 71.7%;
- for ICT-EOIs - 73.3%;
- for non-ICT-EOIs - 66.1%.

According to this survey, the percentage of EOIs with high i-security performance for EOIs with over 500 employees is about twice as high as that for EOIs with up to 10 employees (Fig. 2).

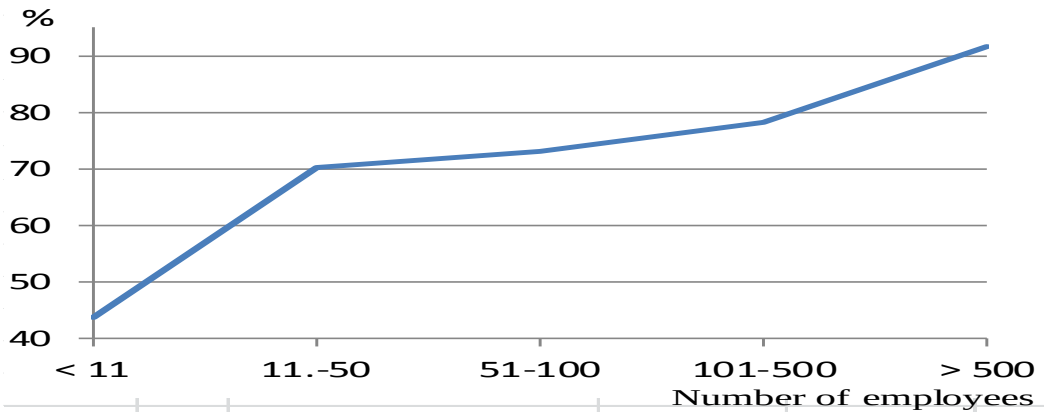

Fig. 2. The %EOIs average value (on indicators 3-26) dependence on the number of employees [6].

Thus, even according to this narrow set of 24 indicators (for example, the ETSI set contains 97 indicators [9], and the CIS one - 171 indicators [10]), it can be concluded that the state of EOIs i-security is relatively low, which confirms the need for additional measures in the field.

3. Destination, purpose and objectives of PINFOSEC polygon

PINFOSEC polygon is intended for experimentation, research, adaptation and development (ERAD-ment) of i-security solutions in support of needs of the Republic of Moldova. The purpose of launching the polygon is to create conditions, provide necessary infrastructure and tools for ERAD-ment and propose practical recommendations, solutions aimed to differentiated informatics securing, taking into account the Moldova particularities. The basic objectives regarding the PINFOSEC polygon consist in:

1. Creation of an extensible platform for the ERAD-ment of i-security solutions (SECIM).

2. Development of SECIM modules for the ERAD-ment of i-security solutions.

3. Development of a system of i-security models (SIMOSI) for application as needed.

4. Implementation of SECIM modules within the SIMOSI system, research through simulation of their i-security features and their development to strengthen performance.

5. Integration with the INFOSEC website for differentiated information of public administration institutions, economic agents and population regarding the dangers, vulnerabilities, means and activities on i-security, thus forming the PINFOSEC informatics space (i-space).

SECIM platform must form the technological support of ERAD-ed means of i-security. SECIM modules must be created as adaptations/developments of means of i-security. Based on SIMOSI i-security models, concrete solutions for differentiated i-security have to be generated, adapted to the needs of respective categories of entities in Moldova. The INFOSEC specialized website will facilitate the initiation in the field of EOIs and population and their target orientation in the diversity of information related to i-security.

4. Functional structure of the polygon

PINFOSEC i-space will be created as a secure virtual computer network (RINFOSEC) within the Techinical University of Moldova (TUM) i-infrastructure (Fig. 3). Within RINFOSEC, equipment can be used only within the PINFOSEC i-space. PINFOSEC means will be used to create, configure and emulate various informatics infrastructures and cyber incident situations, intended for the ERAD-ment of i-security means in accordance with objectives defined in section 3. Therefore RINFOSEC will include such i-means as: network stations, routers, switches, wireless access points, data transfer channels, transmission media, including wireless ones, i-tools, i-applications, specialized software, various information resources, etc. The basic technological solution of resource cooperation for exploring the PINFOSEC i-space will be a client-server one with five distinct categories of network stations (Fig. 3):

- PINFOSEC servers;
- PINFOSEC-Internet server that will host the INFOSEC website;
- Internet client stations - computers, smartphones, etc. outside the PINFOSEC i-space;
- PINFOSEC-Internet client stations - computers, smartphones, etc. outside the PINFOSEC i-space, but with restricted access to it;
- PINFOSEC client stations - computers, smartphones, etc. within the PINFOSEC i-space.

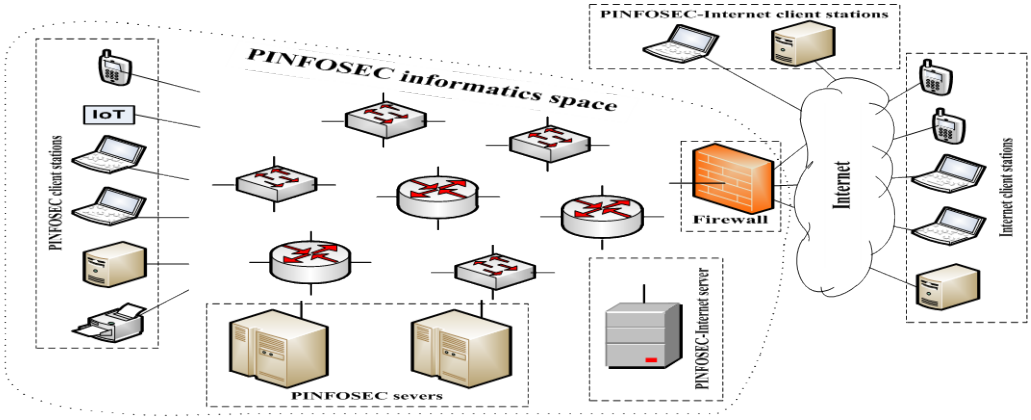

Fig. 3. PINFOSEC general funcţional structure.

PINFOSEC servers will be used for the ERAD-ment of i-security means. Their functions can also be performed within servers that perform other functions than those of PINFOSEC, within the i-infrastructure of TUM with the respective i-security. The PINFOSEC-Internet server (which will host the INFOSEC website) will serve both for Internet access of users to public information, and for some works of ERAD-ment of i-security means. Internet client stations (outside the PINFOSEC i-space) will be used to access the public information of INFOSEC website and, in part, to restricted access of some PINFOSEC resources through the INFOSEC website. PINFOSEC client stations (within the PINFOSEC i-space) will be used by users, depending on rights granted, for configuration, administration and ERAD-ment of i-security means. PINFOSEC-Internet client stations (outside the PINFOSEC i-space) will be used by users (Administrators and Operators) to access the public information of INFOSEC website and to restricted access of PINFOSEC resources through the INFOSEC website. If necessary, along with client-server technology, other technologies for network resource cooperation will be used.

Access to PINFOSEC i-space will be restricted. According to the level (rights) of access, three categories of users of PINFOSEC i-space will be distinguished: visitors, operators and administrators. For the three categories of users, two types of interfaces will be used: the PINFOSEC Administrator Interface - for administrator and operator users, and the INFOSEC Visitor Interface, also called Public Interface - for visiting users of INFOSEC website, including administrators and operators in quality of visitors. The Administrator Interface will be with limited access, authorization being obtained through a username, password and IP address of the access station, and the Public Interface will be with unlimited public access. So:

- Administrators constitute a distinct group of users who have unlimited access to the Public Interface of INFOSEC website and, through the Administrator Interface, to the Management System of PINFOSEC i-space;
- Operators constitute a distinct group of users who have unlimited access to the website Public Interface and limited access, through the Administrator Interface, to the Management System of PINFOSEC i-space. The rights and

access functions to PINFOSEC i-space Management System are defined by Administrators for each operator;

- Visitors are Internet users who have unlimited access to the Public Interface of
- INFOSEC website, and through this, possibly, to some PINFOSEC resources.

In other words, all users, including Visitors, will have access, through the Public Interface, to the content of INFOSEC website, and Administrators and Operators will have access, through the Administrator Interface, to the PINFOSEC i-space Management System. In order to increase the security of PINFOSEC i-space, Administrators and Operators must be able to access the PINFOSEC i-space Management System only from certain computers, obtaining for this purpose an additional authorization, in addition to name and password, after the IP address of the computer, from which the access in question is attempted. Upon entering the system, depending on the nature of access, the system will display to the user either the Public Interface or the Administrator Interface. Visitors must also be able to access via the FTP service to copy very large content files from INFOSEC website. As client computers, when accessing the resources of PINFOSEC i-space, can serve the Visitors computers and also the Administrators computers and those of Operators. The access to Internet Server of PINFOSEC i-space will be made:

- for users - from any computer with Internet access;
- for administrators and operators - from certain computers in the TUM Informatics Network and, if necessary, a small number of other stations with Internet access.

The network interconnection of Internet and PINFOSEC-Internet client stations and of PINFOSEC-Internet server will be performed through Internet, and within PINFOSEC i-space will be performed through means of TUM Informatics Network, using routers, switches, transfer data media and, if necessary, other equipment. The infrastructure of PINFOSEC i-space will be reconfigured, depending on the investigated i-security means. The performance required for client stations used by PINFOSEC users depends on resource requirements of operating systems and applications used to access PINFOSEC resources and to receive, store, and render responses to requested requests. Thus, there are no special performance requirements for Internet client stations. For PINFOSEC-Internet and PINFOSEC client stations, these requirements also depend on specialized software to be researched, the experiments to be performed, but, initially, special performance requirements are not also submitted. Obviously, running applications with advanced graphics or video will require respective performances at client station used for this purpose (VRAM memory capacity, processor productivity, etc.). Of course, the main focus is on PINFOSEC-Internet server and PINFOSEC servers. The specificity of PINFOSEC-Internet server consists, first of all, in the fact that it will contain a relatively voluminous Database and File System; secondly, it is intended to serve a wide range of users online in real time. Special resources may be required in some research for PINFOSEC servers as well. At the same time, in order to ensure the minimum reliability requirements, it may be appropriate, in some cases, to use the reservation of resources.

5. Some PINFOSEC polygon functional aspects

As mentioned in Section 3, SECIM platform will form the technological support of i-security means that will be ERAD-ed within the PINFOSEC polygon. SECIM modules will be adaptations/developments of some means of i-security. They will be developed using as a starting point, for example, the CIS Controls set of actions/sub-controls [10] or similar, including those aimed at meeting the performance requirements, as measured by the ETSI Ifomation Security Indicators [9]. Based on SIMOSI i-security models, concrete differentiated i-security solutions will be generated, adapted to needs of various categories of entities in Moldova, considerably facilitating the respective activities and, at the same time, strengthening the expected effects. The SECIM platform extensibility will allow the resultant continuation of the ERAD of i-security solutions in rhythm with the advancement of theoretical results and of practical means in the field.

Within PINFOSEC polygon, such means could be implemented/researched as:

1. Vulnerability management systems (vulnerability knowledge base, connected to such international vulnerability databases as: https://nvd.nist.gov/, https://vuldb.com/, https://www.cvedetails.com/, https://www.exploit-db.com/, https://www.rapid7.com/. Vulnerability detection and prioritization, automation and efficient integration with existing security infrastructure and processes - (*Vulnerability Manager*).

2. Real-time event monitoring and management tools for detecting threats and vulnerabilities. Correlation capabilities to identify fraudulent schemes and abnormal user activity. Traffic analysis to detect threats that cannot be detected by standard tools, such as IPS/AV/Firewall - (*SIEM*).

3. Models/instruments with penetration tests. Ability to simulate attacks and prioritize critical resources for protection.

4. Security risk identification and prioritization systems to help reduce threat exposure and the risk of data loss, information risk management. Risk analysis associated with the human factor - Human Risk Analytics. Models of Security Risk Analysis Methodologies according to ISO 27005, NIST 800-30, such as BSI IT-Grundschutz (Germany), Mehari and Ebios (France), CRAMM (United Kingdom), etc.

5. Tools for reporting the conformity of security systems to comply with the requirements of national and/or international regulations (GD RM 201, ISO 27001, ISO 22301, ISO 27017, CIS Controls, PCI DSS, GDPR, NIST, OWASP, etc.) or their violation.

6. Models for identification and selection of control measures. Analysis and integration of best practice frameworks, combining COBIT 5, PCI DSS, ISO 2700k, NIST SP800-53, CSI and GDPR to ensure a comprehensive security approach. Elaboration and monitoring of identified risks treatment plan (*Risk Manager*).

7. Template packages for SIMOSI: context, security requirements and objectives, policies and procedures, nomenclatures with assets, vulnerabilities and threats, etc. (*Toolkit*).

8. IT tools and techniques regarding the audit activity in i-security (*SecAudit*);

9. Automation of i-crime investigation techniques - (*Digital forensics*).

10. Educational platform - a special environment for training, awareness programs, training of hacking skills, etc. (*EduSec*).

INFOSEC website will ensure the prompt information of EOIs and population on vulnerabilities, risks, means, incidents and actions of computer security and other important aspects in the field, including their target orientation in the diversity of online information related to i-security.

6. Conclusion

The concept addresses the major aspects related to elaboration, implementation, maintenance and development of PINFOSEC polygon, starting from the definition of purpose, objectives and basic requirements towards it and to the elucidation of respective strategic technological solutions. PINFOSEC polygon will significantly contribute to the creation of necessary conditions for improving the security of informatics resources of enterprises, organizations and public administration institutions and those of population in Moldova. At the same time, the conditions for training of highly qualified young specialists and for the continuous training of specialists in informatics security and information technologies in general will be improved.

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The role of PPPs in creating sustainable cities - Lessons for cities in Sub-Saharan Africa

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Abstract

Cities remain an anchor for society. As cities emerge, they fascinate and inspire generations. Existing literature reveals that the term "cities" resonates with opportunities that are increasing difficult to meet with reducing central transfers. Based on a review of literature, this study reveals while central transfers have caused administrative financial distress and messy cities. Existing literature reveals that while PPPs have been adopted among cities in the developed world, adoption in Sub-Saharan Africa (SSA) has been slim despite dire need for escalating service alongside the passing of PPP Policy, legal and regulatory framework with immense literature pointing to capacity gaps. Based on a systematic review of literature this study provides lessons that can guide the applicability of PPPs in cities in SSA. The outcome of this paper is relevant because it adds to knowledge necessary to deliver services through PPPs in Sub-Saharan Africa (SSA), the application of PPPs can enable cities in remaining relevant to their dwellers and visitors while resolving to some extent administrative financial stress that characterises cities in the developing world.

Keywords: *Cities, Public Private Partnerships, private not-for-profit, private-for-profit.*

1. Introduction

The investigation of how cities emerge and transform, continues to fascinate and inspire. While some governments seek to reinvent cities, others are pondering of ways to sustain them. Other governments across the globe have ventured into creating new cities. In Uganda, seven (7) new cities have been rolled out as at 1st July 2020. In Rwanda, preparations are ongoing for creation of new cities. In countries like South Africa, Burundi, Zimbabwe, multiple cities existed but quite distressed in delivering service. Society expects that cities are designed to be smart and eco-friendly taking advantage of all their unique features and qualities [23]. This study conceptualises the idea that city planning management is about strengthening a city's capacity to respond to change. The study argues that, increasing organic revenue to meet demands of cities is unsustainable. As such, we assert that a city of required urban atmosphere needs new approaches such as public private partnerships to thrive as sustainable cities. While other approaches like Municipal or city bonds exist in the developed world, developing countries such as Uganda have not developed neither provided such bonds on the market's menu. In this context, PPPs have emerged as one of the delivery options that cities can embrace [60].

Recent studies view cities as a dominant force in any nation's economic growth and development journey across the world [39]. To illustrate, three largest cities in China occupy only 5%of land but are responsible for 40% of GDP. While in countries like Uganda, the Capital City of Kampala is associated with 60% contribution of GDP [18]. The opportunities have attracted population densities that have overstretched service delivery capacity in some cities. This has resulted into: congested schools; traffic jams; road nuisances such as hawking activity; unmanaged waste and slums. Existing literature indicates that to become a city that is liveable and cherished by dwellers, a city must offer services that are in tandem with the size and needs of the urban dwellers [04; 33]. Such services include: electricity, healthcare, jobs, access to basic resources, adequate housing, sanitation and opportunities. Notwithstanding, public safety and responses to climatic changes are required deliverables of city administrators [39].

Cities display have throughout history been known as centres of excellence for: education; politics; commerce [22,05,48] healthcare; housing; mobility; green spaces; leisure; innovation; entrepreneurship; innovation; business; commerce social services; culture and industry [33]. They are centres of productive jobs which do not arise by mistake but rather by well-designed urban systems [20]. Further to this, they are viewed as places for showcasing gigantism and passion [39]. According to the United Nations cities are assets as they provide solutions and act as drivers of economic and social development [58]. A city is deemed to be the nation's connector to the outside world, a status provided by its technology, transportation, telecommunication systems [58].

A city is further acknowledged to be the biggest market in any given country for goods and services while at the same act as the core centre for employment, jobs and livelihoods [33]. Empirical studies by [33] indicates that cities play an important role in growing Gross Domestic Product (GDP), noting that cities tend to be

associated with greater output per capita than other areas. Green energy, green spaces and natural habitats are requisites for cities and must be highly competitive for international capital and that their enterprises must be highly competitive in trade. Successful cities are characterized by ability to provide personal security, prosperity defined in great jobs and wealth, equity in terms of investment, entrepreneurship, hard work and openness to the world economy, sustainability, nature earth, liberty in terms of freedoms of conceivability and democracy, where needs of city dwellers and citizens at large are listened to and incorporated in the city's planning [04].

Cities and municipalities have financed their development using traditional approaches using traditional financial instruments meet their development agenda [35].These have included fees and charges (congestion charges, parking fees, high occupancy tool lane, building permits, utility tariffs and fees and electricity user fees), grants (general grants with environmental indicators, specific grants for environmental goods and services, matching grants), land based income (development charges/impact fees, value capture, higher density building rights, loans and green bonds, carbon finance (clean development mechanism or joint implementation ,voluntary carbon offsets).

An estimated 3 million people move to cities every week. By 2050, city dwellers are expected to outnumber their rural counterparts by a ratio of 2:1. Saddled with legacy infrastructure and limited budgets, many urban areas are struggling to keep pace with such rapid growth. The result is increased congestion, reduced quality of life, lost economic potential, and negative health outcomes [17]. While budgets of cities and local government administration were traditionally adequate, they are now constrained while at times underfunded due to rising dwellers by night but more importantly rise of numbers of dwellers during the day [33]. As municipality and city populations increase, new demands for transport, healthcare, social amenities like parks, golf courses, markets, tourism, sports and sporting, facilities, decent accommodation, education. Cities must be energetic, full of inspiration and remain a habitat for enthusiastic communities of nationals and diverse communities [04].

Amidst this context, cities find it difficult to provide necessary character and services for city dwellers and visitors, thus derailing the achievement of UN SDG 11: Sustainable Cities and Communities. To reduce pressure on existing financing available to cities, has come the adoption of blended financing option, public private partnerships (PPPs). Cities around the world are increasingly looking to implement initiatives that respond to these challenges. Just 16 percent of cities are able to self-fund required infrastructure projects. As a result, cities are enlisting the support of private and non-profit partners to advance their smart city agendas [17]. Public Private Partnerships in the SMART sector as argued in this study, differ from traditional PPPs and deserve particular attention for several reasons. PPPs for SMART projects often represent small-scale projects involving technological infrastructure and solutions rather than large-scale physical infrastructure. In fact, SMART PPPs often build on conventional PPPs, adding a SMART technology element

to infrastructure projects. For these reasons, they are sometimes less visible and tangible for the final user [55]. This study sets out to answer three distinct research questions namely: What sectors are PPPs implemented in cities? What are the PPP models implemented across sectors in cities? and; What are the critical success factors for PPPs uptake in cities?

2. Public private partnerships

Globally, the term PPPs in government circles has been adopted to refer to collaborations between the government and private sector coproduction and delivery of public services [42;49]. PPPs can be defined as an arrangement that "is created when a government agency enters into a long-term (typically 25- to 50-year) concession agreement with a project-based legal entity called a special purpose vehicle (SPV), under which the SPV has the right and obligation to finance, design, build, operate and maintain a facility (or some subset of these roles) in accordance with contractually specified performance standards." [39]. PPPs have also been defined as a procurement method that is feasible for specialized infrastructure [53] projects, confirming earlier studies that argue PPPs as a procurement method for large risky public infrastructure works [15].

During the same period, studies by [32; 30 and 57] affirm the view that PPPs have been implemented as a procurement strategy for large public sector projects. Others suggest that PPPs a mere BOOT contracting strategy. Inconsistent with this view [45] argue that PPPs differ from procurement in way that PPPs carefully involve the identification and allocation of risks to parties that are well suited to manage the risks. In other studies, it has been argued that PPPs have been adopted as a sourcing method for transport infrastructure [55]. While other scholars too define PPPs as "the integrated risk-sharing agreements that hold both public and private partners to account for the project's success" [59; 260]. This view has been re-echoed by [41] that acknowledges that public infrastructure such as roads have been procured through PPPs. While some distinction exists, a review of existing literature we can deduce that PPPs are a strategic procurement method that is adopted for complex, high value needs where the private sector provides financing unlike other methods of procurement where the state provides financing.

Within cities, PPPs have supported administrators to improve provision of facilities, goods and services such as transport, water, waste management. Most PPP contracts have provided value for money and have helped to solve serious problems of coverage and quality of service both in the developed and developing world [31]. However, some outcomes have been problematic, with failures in many PPP contracts, including breakdowns and early termination of contracts. In fact, most PPP contracts are renegotiated. In a study for Latin America (sample of 1,000 contracts), it was also discovered that 75 per cent of the water concession contracts were renegotiated on average 1.6 years after their signature [34]. Under this circumstance there is bilateral bargaining to restore a mutually acceptable situation for the parties, which undermines the legitimacy of the original contract award.

Nonetheless, it is PPPs and Procurement are and continue to remain cousins. The two terms are intangible. Coexistence of the coexistence of PPPs and procurement are recognized in recent studies [65; 66; 10; 63; 44 and 67]. In addition, it is argued that while PPPs have been implemented across a diverse sector the concept has been applied in urban renewal [68].

Other studies indicate that improvements in public utilities infrastructure (water, roads, electricity, telecommunications, ports, airports) are a necessary condition for enhanced economic performance and poverty reduction [49]. As new cities emerge, this situation posits cities as a lab for trials and accommodation of errors. However, we argue that by learning lessons from existing adoption of PPPs in cities and urban places, nations reinvent and start new liveable and vibrant cities with limited expensive redesigns and reworks.

It is further opined most cities are characterized with high population densities. Such densities expose cities to nuisances such as traffic jams, development of slums [12]. To manage these jams and lost time by city dwellers, cities have developed transit systems manned by buses under bus rapid transport systems, or light train service. Due to budgetary deficits, cities have privatized metros to private investors driven by the need to tap into private finance while seeking for efficient and effective managerial economies. [12] argues that PPPs models have been applied in cities such as Beijing, Shenzhen, and Hangzhou have applied PPP models with operations of PPP lines contracted to private companies. While PPP models have been applied, benefits of this initiative marketisation however, hasn't helped. While it is acknowledged that that metros in Tokyo and Hong Kong have operated with some profits, transit rail systems run on operational deficit [12].

East Asian cities (and countries) differ from most western cities (and countries) in size of metropolitan areas and population densities. The capital and large cities of East Asia typically have populations well above 5 million, high population densities, motor vehicle restriction measures in place, and high proportion of trips made by public transport. Public transport mode shares in Hong Kong, Singapore, Seoul and Tokyo are in excess of 50 percent [69]. These characteristics are favourable for large scale urban rail developments, in particular heavy metro development. Mega populations and high train densities have several implications for urban rail transit operations. In this section, we discuss three distinctive features of East Asian urban rail transit that differentiate them from those in most U.S. and European cities, viz., high fare box recovery, successful land value capture, and vertical structure of urban rail transit companies.

3. PPP experiences in the cities in different parts of the world

While existing literature provides some empirical evidences on the benefits of PPPs from developed country perspectives [37], literature on evidences of successful toll concession PPP projects in the roads sector of many cities in developing countries remain scanty and unfound despite uptake of PPP projects in many countries that has lasted over a decade. This section reviews literature of some of the PPP projects seen across the world. For instance, in North America, the

government of Canada has adopted a number of PPP Projects to improve infrastructure in her cities such as Ontario where a 30-year Design Build Finance Maintain contract for the ministry of justice has been undertaken [70]. It should however be noted that there have been a number of problems with PPP projects in the major cities of United States. In California for instance, State Route (SR) 91 in Orange County was a privately financed project that built additional electronic variable toll lanes along the existing SR 91 highway route in the cities of Los Angeles, San Francisco and San Jose. However, economic growth in the area led to growing congestion on surrounding highways [71].

For South America, in 2016, there were a total of 13 hospitals in operation under the PPP model, located in Brazil, Chile, Colombia, Mexico and Peru [72] PPPs have also been used in courts and courthouses, administrative centres, police stations, town halls or sports stadiums throughout Latin America [73].

With Europe, some PPPs in the cities of the Netherlands have provided disappointing results [26]. However, despite not meeting expectations, some PPPs in public transport are acknowledged to have delivered to expectations such as the A59 motorway between the cities of Geffen and Oss, high speed train that link between Belgium border and Amsterdam under the BOOT Concession. Similar events of disappointment in urban toll concession PPP projects in the roads sector have been reported in many of the European cities. The UK has got more experience in the use of PPPs to refurbish, develop and maintain infrastructure in different sectors such as railways, roads, water, sanitation, education and health sectors in her major cities of London, Manchestor, Edenbough, Glassgow, Liverpool, Dublin, Bermingham and black pool than any other country in Europe [2].

In 1992, the UK government passed a legislation to promote the application of Private Finance Initiative (PFI) PPP model, and with the accomplishment of a batch highway infrastructure projects, authority and scholars in England summarized the new progress and experience of PFI. As of March 2016, there were 716 PPP projects in the UK with a capital value of £59.4 billion. The four largest sectors for PPP projects were the health sector, with a value of approximately £13 billion, followed by defence and education at £9.5 billion and £8.6 billion, respectively. The transport sector had £7.8 billion of PPP activity [71]. The cost of capital for the first 12 hospitals made with PFI is about 1.2 billion euros and when the projects are evaluated over the life span of 30 years, the cost to the state is about 6 billion euros. In Asia and Pacific region, China's PPPs which are mostly Build Operate Transfer (BOT), are used in sewerage treatment through local governments granting concession contracts to the private sector. A new list of PPP projects involving 320.7 billion US dollars of total investment selected from a total of 2053 projects submitted by local governments was introduced in September 2016, as part of the country's efforts to promote investment amid an economic downturn [62].

It has been argued that China Public Private Partnerships Centre under the Ministry of Finance (MoF) announced that a total of 11 260 PPP-funded projects were registered, 1351 projects of which were signed with a combined investment of 2.2 trillion Yuan, by the end of 2016[62:2]. The country boasts many other large scale PPP projects that are already in existence. Australia has a long history of PPPs.

Cases include the Cross City Tunnel toll concession PPP project in the roads sector connecting the cities of Sydney, Melbourne and Perth went into receivership in 2006 with debts amounting to $570 million has continued to be constrained by refinancing constraints. Perth Airport is run by a private company financed mostly by superannuation funds, including being owned by a subsidiary of the Australian Government's Future Fund. It is reported that most territories in Australia use the Build Own Operate Transfer (BOOT) model to do away with constraints associated with budget financing because fewer public funds are used when implementing PPPs projects in the roads sector. Accordingly, it has been recognised that in such context the bulk of the funds come from the private sector in countries like Kenya [74].

The first PPP project in Australia was the Harbour Tunnel in Sydney. Construction began in 1987, and operation started five years later at a cost of US$749 million. Others include the Melbourne 14-mile toll way [71:23]. In West Africa, the energy sector and road sector especially in her major cities of Lagos, Abuja, Ibadan, Port Harcourt, Kano and Kaduna have been earmarked as fundamental areas for economic growth and development of Nigeria and this is being done through [1: iii]. The Victoria Island –Epe Express toll road commonly known as "Lekki Expressway" is critiqued to have failed as a toll concession PPP projects in the roads sector due to lack of stakeholder engagement and approval [75]. Ghana endorsed the Infrastructure Investment Fund Bill [75]. This is because Ghana looks at PPPs as a financing mechanism for implementing a number of infrastructural projects in the roads sector. Such PPPs are aimed at providing improved public services to the people especially in the transport, energy, housing, water, sanitation and education sectors [75].

In southern Africa, South Africa has more than 50 PPP projects being implemented at provincial level. The majority of them are in Gauteng province and 300 PPPs at municipal level especially in the urban centres of Johannesburg, Pretoria, Cape Town, Durban, East London and Port Elizabeth [77:89]. These include a 30-year Maputo Development Corridor BOT contract between South Africa and Mozambique [78] and a high-speed rail known as the Gautrain [76].

In Botswana, PPP projects include road and physical infrastructure among others. The East African experience shows that PPPs have been implemented in the road sector in Kampala-Uganda, Rwanda, Juba, Bujumbura, Nairobi, Dar es Salam, Dodoma and Arusha. A spike in interest of concession PPP Projects has been witnessed in this region [1]. Other areas that have attracted private investment have included street parking [40]. PPP projects in the water and sanitation sector have been implemented in West Africa and Rwanda.

Much as toll roads are deemed to be strategic assets, they are now either being handed over to the private sector in full (BOT) green PPP or partial (Equity share with state), lease (brownfield approach) or divestitures (sale of or part of assets). In Kenya, PPP projects have included the: Airport Cargo Terminal of the Jomo Kenyatta International airport and; the Grain Terminal of Mombasa port can be seen in major cities of Nairobi; technological advancement and transfer in major cities of Kisumu; Mumbasa, Nyeri, Magadi, Naivasha and Nakuru.

The major highways that have so far been constructed in the Kenyan cities using PPP contractual arrangements include Nairobi-Mombasa road, the second Nyali Bridge, Nairobi Southern Bypass, Nairobi-Nakuru-Mau Summit, and Nairobi-Thika 12 lane road. The popular PPP models used in Kenya have for instance in the road infrastructure have included; Lease Renovate Operate Transfer (LROT), Build Own Operate Remove (BOOR), Build Lease Transfer (BLT), Build Operate Transfer (BOT), Design Construct Manage Finance (DCMF), and Build Own Operate (BOO) (74:20). In 2016, Kenya used a leasing PPP model to implement an agro based project that was focusing on improving food security and nutrition in the country. This was a grain warehouse under the auspices of the warehouse receipt system. A review of literature shows that a few studies on PPPs in Tanzania have been carried out. Most studies focus mainly on management solid waste [79:18]; health service delivery in Dodoma, [8:11] [80] urban waste management in Dar es Salaam, [82:6] and [83:5]. Other PPPs executed have included the concession contract of TICTS container terminal of Dar es Salaam Port in 2000 and the concession contract of the central railway corridor with some private companies in 2007 [84:5]. In fact, there was a PPP arrangement in form of a power purchase agreement involving the Tanzania Electricity Service Company (TANESCO) and Independent Power Tanzania Limited (IPTL).

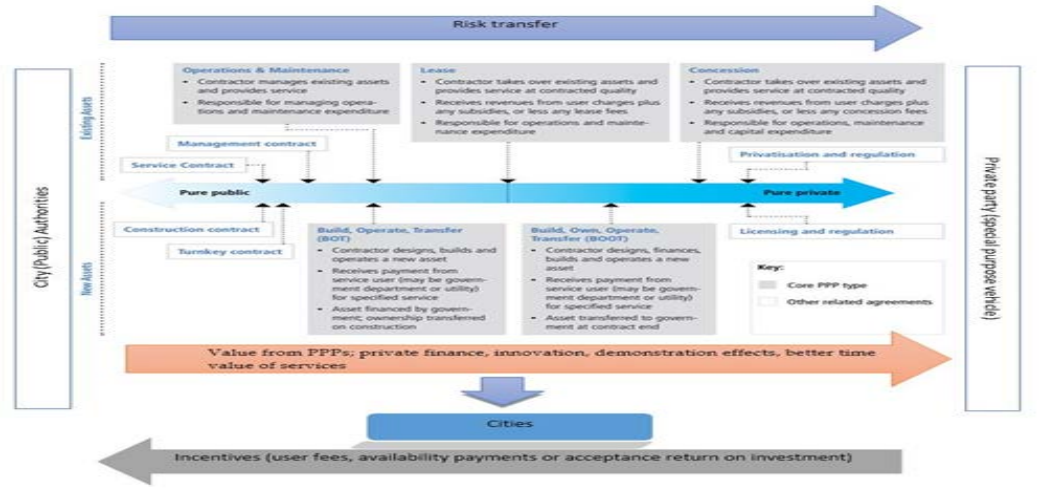

Fig. 1. PPPs and Cities Framework
Source: PPIAF Note 1: PPP Basics and Principles of PPP Framework and modification by authors (2020)

In figure 1, we conceptualize PPPs and cities. The study argues that city authorities usually transfer risk associated with public service delivery such as cost of capital, construction, operation and maintenance risks to the private party, usually known as the special purpose vehicle. In return for acceptance of risk and associated roles, the special purpose vehicle is incentivized through receiving user fees, or availability payment from the city authorities. Availability payment are

conceptualized in line with works of that defines such payments as payments made to the private party for availing a functional asset or service for use by citizens. In reciprocity, PPPs provide value in terms of demonstration effects, private finance, early delivery of services to citizens' innovation.

4. Methodology

As one primary aim was to elucidate the understanding of PPPs and their application in cities on the move to become smart cities. To achieve this objective, the study adopted the study adopted an exploratory design. It has been argued by existing studies that exploratory studies do not provide an understanding of the present and future predications but provide a historical perspective that helps to understand why the current matters are shade and defined they way they are perceived [50]. For collecting data, the main source was review of documentation that included peer reviewed articles. We used Google scholar search engine to search for articles using search words, public private partnerships in municipalities and cities, PPPs in smart cities and PPPs across sectors. Through the search over 1000 articles appeared. We read abstracts and applied delimitation based on search words public private partnerships, cities, public private partnerships and cities, exploratory research methodology. Earlier and similar studies on PPPs such as [56; 6; 85; 26; 86 and 87] and [88] have adopted a methods and materials design. Overall, 100 papers were selected and reviewed under this study.

5. Models of PPPs across city sectors

PPP Models refer to contracting types used in design of public private partnerships. Exiting literature indicates that the adoption of PPP models in cities across the world has been increasing and varying. The Build Operate Transfer has been a popular model [29]. Earlier empirical studies by [67] reveal that under BOT, the government grants a concession right to a private company to construct and provide efficient management of public infrastructure. The BOT model aims at increasing the contribution share of the private sector in infrastructure investment, to relieve the burden of public finance, increase efficiency in the presentation of service while giving firms, who invest in developing countries, the opportunity to transfer their technological infrastructure and experience [89].

Financial and economic aspects have been pular in the evaluation of BOT projects [89]. However, BOT have been largely critiqued for breach of social guards such as environmental and failure by government to provide compensatory trade off benefits in form of reverting foregone expenditure to social sectors like health and education [67]. While studies have acknowledged inconsistency with the application of the model in some sectors as mentioned by [67]), other studies have associated the model with toll road projects [58].

Further to this, there are studies that have been conducted on the application of BOT models in projects such as energy [32; 39]. While PPP models have been associated with challenges, uniquely the BOT model has been faced land acquisition

challenge major challenge asset acquisition [67; 39; 32]. The challenge has majorly been attributed to unfavourable land laws that provide absolute ownership of land by individuals other than the state.

By acknowledging such context, and making BOT PPP attractive to investors studies recommend that government entities should own land acquisition risks and review their land laws to reduce exposure to delayed land acquisition risk that has spiral effects in construction and project completion time. The reasoning is that the government and public entity have power to dictate or issue bylaws that can improve the ease of land acquisition.

Franchising has remained a popular PPP model for delivery of public services in cities. Under franchising PPP arrangement, it is argued that city authorities or public entity, leases equipment to the private party to produce and deliver service while placing direct charges user fees on consumers of services produced [90;91]. The concept has been popular in implementing solid and waste management [7]. In healthcare, franchising PPPs have been implemented in companionship with NGOs to increase to achieve to increase access, affordability and effective health service delivery [90]. Citing Lekki-Epe highway in Lagos-Nigeria, franchising PPP has also been applied in management of toll roads [3]. Other sectors that have evidenced increased uptake in franchise PPPs have involved accommodation.

While the transport and housing sector have received increased uptake of franchising PPPs, success has been limited on a case-to-case basis [7]. The major challenges faced in the implementation of franchise PPP have been majorly the failure to accommodate the interests of the vulnerable and poor in the design of infrastructure and fares charged to access both highway mobility and accommodation units. The assumption is based on the principal agency theory that presupposes that PPP parties come into contact with different objectives [41; 39]. By failing to cater for the poor and most vulnerable, franchise PPP have faced user revolts, abandonment and political risks, affecting the health and objectives of PPPs [3]. The private party seeks to maximize profit while the public entity seeks to offer services to citizens or city dwellers by day and night, calling for the need to provide either subsides or alternatives for the poor.

6. Discussion

6.1 Where can PPPs be applied in City's administration?

To establish sectors in which PPPs are applied in cities we reviewed literature and official documents of the World Bank, Country Reports. Based on the reviews of existing studies, literature indicates that PPPs can be implemented across a range of sectors.

Table 1. PPP types in Cities by sector

AUTHOR	SECTOR	SUBSECTOR	CITY/ COUNTRY	TYPE OF PPPs
	Water	**Piped water**		
[8]	Sanitation and Hygiene	Waste management	Jakarta	out-sourcing of routine repairs, billing and payment collection by Jakarta's water supply utility,
[7]	Sanitation and Hygiene	Waste management	Ghana	franchising, contracting-out, open competition, sub-contracting and leasing
[8],[41]	Transport	Toll Roads	Jakarta	BOOT
[39]	Electricity	Generation, Transmission and Distribution of electricity	Kampala	BOOT
[89],[92], [93]	Housing	Accommodation	Dar el Salam and Botswana,	BOT
[94],[95],96], [97],[98] [13]	Transport	General	General	BOT
94],[95],96],[97],[98] [13]	Transport	General	General	BOT
94],[95],96],[97],[98] [13]	Transport	General	General	BOT
94],[95],96],[97],[98] [13]	Transport	General	General	BOT
[9]	Solid waste management	Waste Management		
[99]	Conservation of Tourism, heritage sites and historical urban environments	Nottingham Lace Market, Nottingham, UK	Nottingham City	BOT

From table 2, it is acknowledged that the adoption and types of PPPs in cities have been diverse. Most PPPs in cities have been in the transport sector. This could be attributed to the history of PPPs in general. From a trace, studies by [68] have linked the transport sector as the first most popular sector for PPP adoption. The analysis also indicates that urban centres like cities follow different models in terms of the degree of public and private-sector involvement in the provision of such city services. However, some patterns hold across the range of city contexts. From the highlight in the table 2, [100] the water and electricity are reported as one of the sectors that as area where the private sector and NGOS has been engaged to delivery of public services to city dwellers in Tanzania. In the water sector, concessions have been structured for piping, maintaining and charging user fees for water consumed by residents. While in waste management PPPs have been adopted in managing waste plants with availability payments constituting the remuneration structure.

According to [7] there has been a significant growth in the generation of urban solid waste, doubling or tripling the amounts in some cities. In addition to the increase in the number of tons generated, the typology and composition of the waste has also changed. Until recently, organic compounds predominated, but now more toxic waste that is difficult to eliminate has gained prevalence as a direct consequence of the region's development, which has led to a growth in the consumption of more industrialized and artificial products. Traditionally solid waste collection and treatment is, overall, the municipality's responsibility. It is Small and medium-sized cities normally pay for these operations from their own funds and generally have relatively low service levels (only 70% of the population has access to waste collection services). On the other hand, larger and more important cities are using concessions and contracts with the private sector ever more frequently, achieving higher coverage levels, but neglecting, as in the rest of public services, the most marginal neighbourhoods and informal settlements.

Waste management has remained a dominant sector where PPPs have been adopted. As cities merge, re-invent and grow, they attract populations that results into increase of waste production. As waste increases, budgets for waste management have moved in the same direction. Based on this undertone, cities have largely adopted PPPs to collect, sort, treat waste and generate value from the waste at no cost to the city authority. In Africa Ghanaian cities such as Accra, Tema and Kumasi have implemented PPPs in waste management [7]. The PPP models used have included; franchising, contracting-out, open competition, sub-contracting and leasing of LGs' equipment to private agents. However, over time contracting-out became the predominant mode of solid waste collection (SWC) and forms about 60%–70% of all the waste collected. The analysis in this article therefore focuses more on contracting-out and less on the other forms of partnerships. Unlike franchising and open competition, where private agents collect fees directly from users, in a contracting-out arrangement the LGs pay the contractors according to the volume (tons) of solid waste collected and hauled to the landfill site. The private firms involved in PPPs range from small and micro waste collection companies to large-scale local and international ones. By the year 2001, over 90% of SWC services in the three cities were being provided by commercial private agents. PPPs are argued to increase quality of services [39] and attract savings.

In the tourism industry, PPPs have been applied to conserve, develop and promote heritage sites and preserve historical urban environments. According to [100] PPP projects with heritage components are often focused on finding viable and sustainable new uses. In such PPPs, the public sector entity will usually seek to public sector provide the larger community with access to the cultural significance. It is also opined that PPPs for preservation of historical urban environments aims identifying and building role of the assets, with the subsequent promise that such access will catalyse wider social, cultural, and economic development in a country. The private investor will usually view the real estate business, capable of generating revenue from new and existing uses. Citing the Nottingham Lace Market, the dilapidated property known as popular market for lace production was revitalized under PPPs. A special purpose vehicle (SPV) Lace Market Development Company,

was created with both the city and private investor having equity stakes. The third sector party Lace Market Heritage Trust was involved to raise grants for the operations of the SPV. It is revealed that market area is now a thriving, mixed-use centre for retail, housing, and culture, with cinemas and media centers as cornerstone developments [100].

A mixed-use development where residential use was encouraged and the largest lace factory, the Adams Building, was converted into a further education college. Shire Hall was adapted as the Galleries of Justice Museum. Hockley Village, adjoining the Lace Market area, is now a shopping centre and entertainment district. Pedestrian links were created between the Lace Market and Nottingham Castle and an underground cave system. The project attracted federal funds and European Commission funds and utilized a number of different PPPs developed from the late 1980s to today. NCC had to be flexible, responsive to change, and pragmatic, to balance identity and authenticity issues with market forces and demands. City commitment and buy-in were essential, though original efforts were civic based (*ibid*).

PPPs for heritage conservation thus usually require higher-than-average levels of government oversight, knowledge of the real estate market, and specialized skills because of their values-based nature, to ensure that the conservation outcomes remain a shared objective. The public sector acts as a catalyst. This calls for a number if measures to be put in place. To illustrate, there has to be: a strong vision by government for revitalization; an investment of public resources; facilitation of dialogue with local communities; sustained political will; sustained government financial support, with up-front estimation of investment needs; quantification of potential returns; secured financial investment as well as good communication between the various sectors and local communities. Further to this the private sector has to be incentivized and multilateral agencies that can provide technical support and continuity outside local political cycles should be involved.

7. Implications and lessons for cities in Sub Saharan Africa

Experience indicates that cities are synonymous with challenges that range from financial distress, inability to manage waste, affordable education in city public schools public transport and failure to provide decent accommodation for everyone resulting into slum other than smart and progressive cities. Cities have also been characterized for lacking the liveability character, lacking recreational centres among other features. In line with sustainable development Goal No.17 Partnerships for goals, we argue that private participation through public private partnerships is vital for delivering smart and progressive cities, the champions of national and global economy. Based on existing experience we provide several lessons that can be adopted for considering uptake of cities.

PPPs are applicable to all sectors. The engagement of private sector participation has no boundary. PPPs should be applied in any sector where opportunity lies for engagement of the private sector. In other words, in order for government to consider going into a PPP arraignment, the project under

consideration should first demonstrate value for money. While PPPs are boundary less, it is important that PPPs are implemented within country context specific national policy, law, regulations, guidelines and administrative orders.

Engaging the private sector players should be synchronized with objectives of the specific investors. For instance, the education, healthcare sectors may be attractive to the private not for profit investors, such organisations will achieve hybrid objectives-social and cost recovery driven pricing. Due to low return on investment and the high cost to serve, such sectors may not be attractive to the profit for profit investors. Experience has shown that private for-profit investors rarely complete their tenure and or are usually unattractive with education, healthcare but rather are more interested in PPP projects in sectors such as accommodation/housing, waste management, water and public transport.

While public transport has been deemed attractive for private investors under PPPs arrangement in cities, it's important to note that successes have been majorly in public bus and commuter taxi operations but not in railway or metros. The reasoning has been that capital and operating investment for railway/metros transport is unaffordable for the private sector. While private sector engagement is necessary, there is need to adopt a hybrid approach for managing metros/railway transport operations in the city.

Existing wisdom reveals that land PPPs can add value to journeys of smart cities. Land PPPs involve transactions where for instance a city authority hands over its land under lease agreement to private developer to construct a modern market with facilities such as 5 start hotels, offices, stalls, leisure facilities such as restaurants, paid for parking lots. Usually, the design of the purpose and assets to be installed can be defined by the city authority or proposed by the private developer for consideration by the city authority under unsolicited bid approach. Value can be retrieved from such idle land, in the form of taxes or licence paid by other tiered investors renting or using premises, provision of access to smart facilities to city dwellers and creation of markets for products and jobs for city dwellers employed in malls or build environment establishments, reduced traffic in the city if such facilities contain storeyed parking facilities.

Cities are usually faced with housing needs arising from now predominantly urban poor populations. The failure to manage such needs has made cities turn into congregations of slums. By use of PPPs to provide affordable accommodation for the urban poor, city administrators can get their cities out of slums.

As central transfers to city authorities and local government continue to reduce, cities have become filthy losing the status of smart cities. By engaging private players under PPPs for to invest in collection, sorting, recycle of waste for manufacturing, re-export or import, waste can get off the streets in cities in the journey towards becoming smart cities.

In the city education sector, private education players such as Bridge Academies have proved that providing quality and cheap education in cities is possible. While it is too early to conclude on whether such have such investors have supported cities to deliver quality and access to basic education, dialogues with such players with proposals to take over school management as the city authority remain

with ole of maintaining infrastructure may be considered. Concession management should ensure that fees charged are affordable and that teachers deployed meet the minimum requirements for employment of teachers by national and city authority standards. Renewal or extension of concessions should be hinged to access, availability, enrolment and pass grades midday and terminal grades.

8. Conclusion

The study reviewed experience of PPPs in cities. PPPs in cities have been implemented in developing and developed countries. The outcome of the study reveals that cities are applicable to sectors but commonly implemented in sectors such as city education, housing transport, waste management, electricity While PPPs have supported journeys of cities on the move, and some have been critiqued on grounds of corruption. PPPs have enabled city administrators to improve the financial, social well-being of dwellers but above all making cities liveable, character of smart cities. Quiet importantly PPPs through provision of jobs, business opportunities, decent mobility, improved sanitation and hygiene that are necessary for smart dwellers in cities. The choice of whether to implement brownfield or Greenfield depends of the structure of the private sector. Social enterprise projects in areas such as education and health may be attractive to the private not for profit (PNFPs) but may not be equally attractive to the private for profit (PFP) investors due to low returns on investment. Finally, PPPs in cities have are seemingly great paths. However, uptake has been limited. The study has provided lessons that city administrators should consider when they attempt to implement PPPs especially for cities in Sub-Saharan Africa that are faced with numerous challenges. Further studies should explore why there exists low uptake of PPPs in municipalities that should transform into cities.

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Smart mobility: a comparison between the social media strategies for the public urban mobility services of Rome and Bucharest

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Abstract

The rapid development of cities, along with the growth of urban population, has brought up many challenges for the organization of human urban mobility in the most sustainable and smart way. The high need for modern arrangements of citizens' movement leads to the necessity for searching alternative solutions to develop urban transportation systems and increase satisfaction of passengers, as well as modern and

user-friendly social channels to provide always updated and useful information to citizens and visitors, at any time and in any place it is required. ***Objectives*** *The main objective of the paper is to analyze to what extend social media platforms stand in as a communication tool for public transportation companies and increase engagement of passengers to the process of mobility systems development, making them active members of a community of information consumers and producers.* ***Prior work*** *The role of social media platforms in urban mobility and the level of satisfaction of citizens with urban mobility services was recently studied by several scholars. However, such a comparative study on two European capital cities concerning this specific topic of interest lacks in the existing literature.* ***Approach*** *This paper presents a comparative analysis concerning the social media strategies of public transportation companies in the urban environment. Empirical analysis is based on two case studies shedding light on the level of development and engagement of passengers on social media platforms in Rome and Bucharest. For this comparison, the collected data were analysed through the SWOT analysis tool in order to clearly highlight the findings and compare the results.* ***Results*** *Our evidence shows that social media platforms should be used by transportation companies to provide two-way communication and use a customers' feedback as a source for continuous improvement of services and facilities, to be in line with citizens' demands and technology providers. Moreover, beneficiaries being interested to identify a higher level of responsibility.* ***Implications*** *The rapid growth of social media platforms creates various possible future scenarios for the customers' involvement. Certain gaps in the development of social media strategies in these two cities can become a possible direction for their further evolution in the scientific research as well as for policy making practices.* ***Value*** *The analysis of social media platforms has shown the main growth points for further development of smart mobility in Rome and Bucharest.*

Keywords: *smart city, smart mobility, sustainable urban development, social media platforms, innovative business models.*

1. Introduction

The world is in a rapid process of urbanization. It is estimated that over 50% of the planet's population lives in cities, and by 2050, approximately 70% of people will live in cities [1]. Cities are attractive for people looking for job security, stability and comfort. There are plenty of business and commercial activities, as well as public services, such as hospitals, schools and university centers in the urban areas. Because of this, they are experiencing accelerated population growth. One of the main problems of cities is how to sustainably and intelligently organize the mobility of city dwellers.

Within cities, one can identify the culture of a population especially based on urban design that reveals the evolution of the city from the historical past to the present. Cities are also an important element in tourism, because they attract visitors from all over the world due to their customs and culture. Technological

advancement has led to the emergence of solutions that solve certain technical problems in everyday urban life. At this moment, the cities are full of sensors with different functions, for regulating the time of lighting the street lights, for regulating car traffic, for security issues.

Rapid population growth, as well as high demand for infrastructure and other resources have led to urban planners, and policymakers need to find new solutions to the challenges of accelerating urbanization. While the challenges of cities remain varied, from inadequate sanitation, drinking water supply, adequate transportation, availability of green spaces, managers propose the adoption of smart solutions to the challenges of cities. A different approach was observed regarding the use of state-of-the-art technology for managing challenges in cities and improving the quality of life, as a precondition for creating smart cities [2].

Smart mobility is in a process of expansion due to the development of smart cities. Due to theoretical and practical approaches, co-productive approaches can be identified, generally in sustainable transdisciplinary projects, which allow the exchange of knowledge from a social point of view to generate effective solutions to complex problems facing the real world [3].

Recent approaches to the intelligence paradigm face problems in answering the question of how a system can be transformed from existing analytical structures to new ways of urgent development in the efficient allocation of available resources. In recent years, there has been a shift from technology-focused solutions to intelligence, to society-oriented perspectives, where goals and requirements are integrated into a variety of processes [4]. These concepts of intelligence try to combine different aspects of sustainability with new digital technologies [5].

Widespread access to the Internet, as well as the development of ITC, have led to new ways of communicating. The need to create social connections were met through the use of online tools, respectively communication platform. They allow the creation of messages and their publication in online environments, so that Internet users can be creators and providers of messages, not just consumers and recipients. In the early 2000s a new communication model that is based on users' creative content, known as Web 2.0 [6] was characterized by information exchange tools as well as social platforms. Nowadays, communication is dominated by services that are able to integrate many forms of content distribution, respectively social platforms that are accessed by many users. Due to accessibility, communities and institutions use this type of communication, because they can be implemented quickly. Social platforms were anticipated by Alvin Toffler [7] and are seen as "gatherings of the future".

Social networks are one of the main communication platforms and are growing. According to global and local statistics, Italy has a population of 60.51 million inhabitants, an urbanization rate of 70%, 80.40 million mobile phone connections, 49.48 million Internet users, representing 82% of the total population and 35 of millions of inhabitants who are active on social media, which represents 58%. The main social network accessed by the inhabitants of Italy is Facebook, with 29 million users, followed by Instagram, with 20 million users, Linkedin with 14

million users, Twitter with 3.17 million users and Snapchat with 3.05 million users[8].

Romania has a population of 19.53 million inhabitants, a degree of urbanization of 54%, 26.88 million mobile phone connections, 15.04 million internet users, which represents that 77% of the total population of the country uses the Internet, 11 million people social media assets, respectively 56% of the population and 9.8 million mobile social users, which represents 50% of the total population. The main social network is Facebook, with 10 million users, Instagram with 3.8 million users, Linkedin with 2.6 million users, Snapchat with 1.4 million users and Twitter with 0.3 million users [9].

In order to offer a high degree of both citizens and visitors satisfaction, public transport companies must adapt to the new mobility behaviours and digital social channels. Consistently with the aim of understanding how modern European municipalities are currently addressing this important issue, our research highlights the impact of social networks on the development of communication within public transport companies in Rome and Bucharest.

Consequently, the main research questions of the present study are:

- *What are the main contact points that characterize the socialization strategy of urban mobility services in Rome and Bucharest?*
- *To what extent do Italians and Romanians interact with Urban Mobility Services' social media channels?*
- *What is the level of satisfaction of the citizens of Rome and Bucharest with public transport?*

2. Brief literature review

To address the main problem of the paper we conducted a brief literature review in order to bring to light the main issues of smart urban transportation, the role of social media in it and its impact on the satisfaction of the citizens. Despite the fact that the first studies on the urban transportation appeared several decades ago [10-12], the role of social media in urban transportation was not an issue until recent years and has become popular with the development of social media services.

Recent studies on smart urban mobility have indicated the main current trends in cities' development that affect urban transportation, among them are: growing of urban population, the rising number of public transport, aging population [13-14].

Several systematic literature reviews on various topics of smart mobility were conducted in recent years. A group of scholars [15] have studied the role of Intelligent Transport Systems (ITS) for people and freight transport and its impact on smart mobility, another group of researchers [16] carried out a bibliometric analysis in order to identify the main trends in smart urban transportation. Among their findings – a rising interest among scholars for the topic in the recent years and especially among Computer Science and Transportation Science Technology researches. Butler et al. (2020) [17] in their systematic literature review on the aptitude of smart mobility to moderate transportation disadvantage have created a

conceptual framework and have revealed the main smart mobility innovations discussed in the literature, their application and future potential. Among other dimensions of transportation disadvantages, the author outlines psychological and information dimensions that refer to the barriers of citizens associated with their safety, perception and their acquaintance with urban transportation.

Big IT and transportation companies also make a contribution to scientific literature by studying smart mobility issues. Hitachi in its research on smart mobility for smart cities [18] sees the development of smart mobility as a possibility to promote more sustainable society. Hitachi has studied mobility concept and outlined "5 layers of transportation functions": transportation user experience, transportation services, information collection, information management and control, transportation company coordination. The authors propose three types of optimization and control for urban transportation. Fujitsu's approach [14] is based in three pillars – "personal mobility", this means the development of balanced combination of private and public mobility; "safe and secure mobility", that is aimed at decrease of traffic accidents and "pleasant mobility", this includes the development of telematics systems for urban transportation.

The overcoming of these barriers by means of social media is deeply intertwined with the development of IT technologies. As it is appears in the scientific literature, the role of IT innovations to solve urban transportation challenges is of high importance. Several scholars studied the importance of Internet of Things (IoT) technologies in smart urban mobility from different perspectives [19-22].

The role of social media in urban mobility was recently studied by several scholars [23-27]. Several case studies on the application of social media tools for urban mobility in European countries were recently explored [23, 28-30] .

One of the research questions of our study is connected to the level of satisfaction of citizens by public transportation systems. Since the main field of the study is smart dimension of public transport we found it useful to examine the scientific papers on the level of satisfaction of the citizens of smart cities and their perception of smart urban initiatives. Several studies were recently conducted in this field [31-34].

The level of satisfaction of citizens with urban mobility services was discussed in the recent scientific literature [35-38].

3.Methodology

Consistently with our aim of developing an evaluation scheme to audit and assess the online contact points and means of communication set by modern European municipalities, the present study presents a multilevel approach [39].

First, it was needed to track the main social media tools that can help citizens and visitors to easily access updated and reliable information about the mobility systems of the cities under investigation (institutional level), by collecting information through the triangulation of several sources (i.e. public reports, newspapers, websites and public databases). In this perspective, the authors decided a set of fundamental online contact points to be analysed and evaluated

through the users reviews: (i) the official website of the managing entity of public mobility services for the municipality; (ii) as per the social networks, it was ensured that both the municipalities had official Facebook and Twitter accounts. Afterwards, the usefulness, accessibility and updating of their contents was evaluated; (iii) the official/recognized mobile applications of the municipality public mobility services.

Moreover, secondary qualitative data - in the form of users comments/posts - were collected thorough the aforementioned online channels to evaluate the overall satisfaction of public mobility users (individual level), in terms of efficiency/effectiveness of the services, level of innovativeness of the services, overall evaluations also compared to the price level of services. This part of the process would allow authors to identify the most important strengths and weaknesses characterizing the urban mobility system and its means of communication. To ensure the higher generalizability of results, the collected data have been codified with reference to the nature of the selected event, by labelling it as a normal working day or reflecting the presence of exogenous factors like strikes, extremely adverse weather, weekends and festivity, lockdowns due to Coronavirus pandemic [40].

In order to answer our third RQ and provide a strong contribution to the literature in this field, this study also run a content analysis of the public posts and comments collected through the selected social media channels. This investigation was carried out based on a sample of overall n.639 records, among public comments and posts on several social media channels. Number, nature and source of the data are detailed in table 1.

Table 1. Data collected through Rome and Bucharest's urban mobility social media platforms

Nature	Source	N. of records
Post	Facebook	7
Comment	Facebook	351
Post	Instagram	1
Comment	Instagram	14
Post	Twitter	109
Comment	Twitter	43
Comment	App	122
Post	Official Web Page	3
Comment	Official Web Page	0
Tot.		Posts = 123 Comments = 516

Next, it was possible to codify the text of the online reviews to identify the most common and significant keywords, corresponding to meaningful indicators of the level of satisfaction about the urban mobility system and its means of communication. To this end,

in order to strengthen the final results and make a strong comparison between the evidence of the two city contexts, the authors analyzed the selected data by firstly open coding the text, and then applying axial and selective coding to narrow the focus for the research purposes [41].

The final step of the methodological approach consists of the conduction of a SWOT analysis, based on the selected urban mobility indicators, in order to highlight both the internal (strengths and weaknesses), and the external perspective (threats and opportunities) characterizing the mobility conditions in the cities analysed. Several studies have recently adopted this analytical tool in the domain of urban mobility research [42-44]. This step allows to clearly compare the two contexts and define the priority areas of intervention that are needed. Indeed, the SWOT analysis tool is suitable to be used for policymaking practices, for defining strategic directions and the implementation of measures towards the fulfilment of efficient and effective urban mobility improvements [45]. This would allow the present study to provide a practical contribution to modern municipal smart mobility management systems.

4. Main results and discussions

4.1. Case study Bucharest

Public transport has a high contribution to reducing energy consumption and environmental pollution. It brings many benefits both locally and regionally. Public transport is one of the main services of public interest that is the responsibility of local authorities.

The quality of public transport services directly contributes to the quality of life of the inhabitants, as well as to the increase of the city's activity from the tourist point of view and to the investments. Public transport services are one of the main activities of the local economy.

The main disadvantages of public transport in Bucharest refer to the poor quality of the vehicle fleet that serves certain areas of the city, the low length of the lanes dedicated to the lack of intermodal centers, and the advantages are low fare compared to other European cities or capitals. The public transport system in Bucharest follows two objects. On the one hand, it must respond to the needs related to the enlargement of the city, respectively the access of the inhabitants to a road and efficient system, and on the other hand, the public transport must respect the European strategies.

From the point of view of respecting public transport, public transport must seek a promotion between mobility, quality of life and economic growth [46], because in urban areas lives or a significant part of the European population [47].

Bucharest is the largest urban agglomeration in Romania with a population of 2,155,240 inhabitants in July 2020 and a density of 8771 inhabitants km2, which represents 13% of the total population of Romania. In the context of the existence of special social and economic opportunities, the real number of the population living, working or learning, in reality, is higher than the registered one.

The passenger transport service in Bucharest and in the metropolitan area has the highest share in Romania as an area of merit and as a number of uses, operates on the principle of continuity and is based on an experience gained in 111 years of

activity for the benefit of the community. It is also a service of general economic interest, as it is based on mobility and access to urban facilities, accessibility to social and health services for all categories of people.

The main economic operator for urban transport in Bucharest and in the metropolitan area is the Bucharest Transport Company STB SA, being created by the reorganization of the Bucharest Autonomous Transport Authority, in September 2018.

The company has one of the largest transport networks in Europe, with a length of 1651 km. The transport network covers an area of 633 km2. The company has about 2000 vehicles (trams, buses, trolleybuses) that make over 700 million urban trips annually. The company has over 11,000 employees [48].

The main contact points that characterize the socialization strategy of the surface public transport company in Bucharest are based on the transmission of information on its own website, on social networks and on the smartphone application. In 2019, 197 information and press releases were published, for direct information of travelers. The site provided information on suspensions or diversions of some routes on the occasion of organizing events in the city, setting up, relocating or changing the name of some stations, supplementing the transport capacity of certain routes, as well as announcements regarding projects in rural areas or various events.

The activity of managing social networks, respectively Facebook, is used for posting press releases, as well as information related to various events conducted by the company or in collaboration with other partners.

The company's Twitter account is mainly used for timely information about all delays, vehicle traffic jams, route changes, as well as for the use of alternative transport routes. In 2019, 1490 informative messages were sent on this social network.

A significant step for the improvement of the transport service was the launch of the INFO STB application in April 2019, which was later renamed INFO TB, is a project developed by the Bucharest Transport Company STB SA. This application can be used by all smarphone owners with an Internet connection. In this application, you can view the routes of all vehicles, you can choose a destination, and the application will show available routes and will choose the fastest route for the desired destination. The journey can start from where you are or from any other point on the map. The application offers access to a transport network with over 1500 vehicles circulating in Bucharest and in the metropolitan area, integrating surface transport with the underground one. The integration of the subway improves and completes the routes proposed by the application, which will be more efficient, with a shorter allotted time between the point of departure and the point of arrival. Within the application you can view on the map the complete route of a line or just a direction of the route and you can save your favorite routes. If a problem occurs with one of the routes, the application will send a notification to that effect. In the page dedicated to routes, you can view on the map in real time the vehicles on one direction of that route. You can select a station from the dedicated main page and you can see all the vehicles that stop at that station and what are the

waiting times for each. In addition, with the help of the application, you can pay for the trip.

In a study on attitudes and perceptions in urban mobility and public transport in Bucharest, conducted by the Research Institute for Quality of Life within the Romanian Academy, conducted in May 2018, on a sample of 1753 respondents. The average age of the respondents is 32 years old, with a university education in proportion of 90%, the owners of a car in proportion of 75%. In terms of travel in Bucharest, the most common vehicle is the subway, often used by 51%, followed by buses, trams and trolleybuses in 43%, personal cars in 24%, taxis and bicycles in 12% and scooters in the proportion of 2% [49].

Regarding the frequency of use, 28% of them use it daily, 31% use it between 5 and 6 days a week, and the rest use it less than 3 times a week. The average use of round-trip public transport is between 70 minutes and 80 minutes. The nearest station is located on average at 7 minutes, and 11 minutes is the average waiting period at the station.

In terms of conflict and violence in public transport, 88% had a feeling of insecurity in public transport, 96% witnessed verbal violence between passengers, 72% witnessed violence between drivers and passengers, 93% witnessed quarrels between ticketless passengers and controllers, 64% went without a ticket, and 57% were harassed in public transport or waiting stations.

Regarding the satisfaction with the accessibility and use of public transport, 41% of the respondents consider an accessibility of public transport, 32% use this type of transport in winter, 18% agree with the frequency of means of transport, and 5% consider an accessibility high for people with reduced mobility. At the level of satisfaction with the public transport facility, 70% agree with the tariffs, 21% are satisfied with the places available in public transport, 16% agree with the cleaning in vehicles, and 9% are satisfied with the air conditioning in public transport.

From the point of view of the strategy of improving public transport in terms of taxes, 76% are willing to pay more per ticket, 74% want to charge car access in the central area of the city, and 25% want to be free public transport for the inhabitants of Bucharest. Regarding the priority access and the special lanes, 92% consider that special lanes are introduced only for the surface public transport in the central areas, 77% want the means of transport to have priority on the small streets. And 86% want bicycles to have priority on small streets. In terms of waiting times and stations, 60% believe that the stations of means of transport should be more frequent, and 99% want the arrival time of vehicles to be announced.

In the study, the subject of civic behavior is also approached. Within it, 32% of the respondents addressed the district mayor's office to solve a problem, 26% made requests or complaints to public transport companies, and 66% participated in protests to solve community problems. The study also shows the availability of giving up the use of personal cars in favor of public transport, 93% would like this.

4.1.1. SWOT analysis

In order to better understand the conceptual and the purpose of the communication strategy at Societatea de Transport Bucuresti STB SA, an analysis of the clients' posts and comments was made, and the results are presented in the SWOT analysis. The most popular social networks are Facebook, with over 4,000 followers, Twitter with almost 2,000 followers, Instagram with about 100 followers and INFO TB application with over 100,000 downloads.

Table 2 shows the amount and type of data collected through these social networks and then analyzed to achieve the purpose of the paper. Data were collected with reference to three different exogenous scenarios, representative of the most common types of days: normal working days, public strikes and holidays.

Table 2. Data collected through Bucharest's urban mobility social media platforms

Nature	Source	N. of records
Post	Facebook	3
Comment	Facebook	146
Post	Instagram	0
Comment	Instagram	0
Post	Twitter	14
Comment	Twitter	0
Comment	App	0
Post	Official Web Page	3
Comment	Official Web Page	0
Tot.		Posts = 23 Comments = 146

To systematize this data, a SWOT analysis was performed.

The main *strengths* of public transport in Bucharest is represented by the dense network and with a high potential. Within the city there are over 150 routes, both in the city and in the metropolitan area. The rates for making the trips are low compared to other cities in Europe, there are many payment methods, including through the INFO TB application or by SMS. The fleet is partially modern, with hybrid buses, with low fuel consumption and buses from 2018.

In terms of *weaknesses*, the lack of single lanes for public transport, especially buses and trolleybuses, leads to substantial delays. Drivers of these vehicles often face the blocking of stations, because the city does not have enough parking spaces. The lack of an authority to manage surface and underground transport leads to the application of different policies to the two types of transport.

Among the main *opportunities*, the new urban projects for attracting new flows of passengers refer to attracting those people who travel with their own vehicles. In a new urban project, with single lanes dedicated to public transport, they could give up their own vehicle, for a much faster trip. In order to reduce the traffic in the city, park & ride systems can be arranged on the outskirts of the city, which should be correlated with the public transport terminals.

In terms of *threats*, the number of vehicles in the city is growing, leading to a congestion of traffic. The new residential neighborhoods that are being built on the outskirts of the city or in the metropolitan area do not provide for the integration of public transport, and this leads to overcrowding and various technical improvisations to integrate public transport.

Table 3. SWOT Analysis based on Urban Mobility Posts/Comments about Bucharest

Strengths	**Weaknesses**
- Dense network with high potential - Low rates compared to other neighboring countries - Public transport allows a variety of options - Partially modernized fleet	- Lack of lanes or single lanes for public transport - The lack of parking spaces leads to the blockade of public transport vehicles - Areas where several routes overlap over long distances - Lack of an authority to control both surface and underground transport
Opportunities	**Threats**
- New urban projects to attract new flows of travelers - Park & ride systems on the outskirts of the city related to public transport terminals - The fact that certain routes are crowded shows a high demand for public transport - Reviewing traffic programs for efficiency	- Number of vehicles growing in the city - Blocking other vehicle stations - Urban plans for new shopping centers or residential neighborhoods do not provide for the integration of public transport from the beginning and later there are various improvisations.

4.2. Case study Rome

The city of Rome has 4,342,212 citizens (2019) with the population density: 812/km2. According to Deloitte City Mobility Index 2020 about 60% of Romans use private transport, 20 % choose public transport, 18% of citizens travel by walking and 2% use bicycles for their everyday routine (https://www2.deloitte.com/content/dam/insights/us/articles/4331_Deloitte-City-Mobility-Index/Rome_GlobalCityMobility_WEB.pdf). This situation provokes one of the main problems for urban mobility system in Rome - high pollution due to a big number of private transport. Together with the old and undersized fleet it represents the main challenges for the Roman transportation system.

Rome has the Sustainable Urban Mobility Plan (PUMS) developed in 2019 by Roma Servizi per la Mobilità, a company at 100% owed by Roman authorities. The main objectives of the plan are stipulated as follows: to provide all citizens with transport options to access key destinations and services, improve safety conditions, reduce atmospheric and noise pollution, greenhouse gas emissions and energy consumption, increase the efficiency and economy of the transport of people and goods, contribute to the attractiveness of the area and the quality of the urban environment (https://www.pumsroma.it/ilpiano/obiettivi-del-piano/).

Rome's public transport company is ATAC S.p.A. According to ATAC official website it is the first urban mobility company in Italy and one of the largest local public transport companies in Europe.

ATAC manages all forms of public transport in the metropolitan area of Rome: surface and underground transport, railways and parking. ATAC network covers an area of approximately 2,200 square kilometers, ATAC infrastructure comprises 20 operational offices and depots, over 8,500 bus, tram and metro stops etc.

There are more than 11,000 employees in ATAC, the staff is divided at those who play a front-end role (drivers, train drivers, station operators, ticket office workers and inspectors) and those who work in the office, in the support area.

The main ATAC S.p.A. objectives are: customer orientation, service improvement, worker health and safety. One of the main challenges for ATAC nowadays is to make the city more sustainable and livable. In this regard it is important to provide the city with transport solutions and mobility infrastructures, as well as related services that together make urban mobility compatible with the quality of life standards, respect for the environment and individual and collective security.

The running ATAC initiatives reflect the main objectives of the company. The present projects have been developed with a view to the continuous improvement of urban mobility, through solutions that aim at innovation and environmental sustainability. One of such projects is +Ricicli +Viaggi (literally "the more you recycle – the more you travel") is aimed at the collection / recycling of PET plastic bottles through the machines present in subway stations. For each PET bottle the passenger receives an eco-bonus of 5 Euro cents that can be used to purchase travel tickets. Bike friendly initiative provides passengers with the possibility to take there folding and normal bikes to surface and underground transport thereby encouraging the use of bikes in the city.

In order to measure the quality perception of services provided by ATAC, the customer satisfaction survey is conducted annually (https://www.atac.roma.it/files/doc.asp?r=6685). Speaking about surface transport, based on the official data 34% of passengers was satisfied with the ATAC services in 2018, comparing to 34,6% in 2017 and 43,5% in 2016. The trend is opposite in underground transport – 52,8% of passengers was satisfied in 2018, comparing to 51,9 % and 50,3% in 2017 and 2016 respectively.

The analysis of the suggestions and proposals received in 2018 is also provided by the report. All in all 24.753 messages were received, 5,79% sent privately and 94,21% were expressed publicly. 85,56% of all messages were reports of different types, 12,91% were information requests, 1,18% for proposals and 0,34% for gratitude expression.

For online information on timetables and traffic routes on any changes or temporary interruptions of the service, events and projects of ATAC, several tools are used : the ATAC official website (www.atac.roma.it); the "travel with ATAC" App, profile in Whatsapp, the official social channels of ATAC S.p.A. in Facebook, Instagram, Twitter and YouTube.

4.2.1. SWOT Analysis

In order to understand the concept and purpose of social media strategy of ATAC S.p.A. an analysis of posts and customer comments was conducted. The results are presented in SWOT analysis. The most popular accounts among customers of ATAC S.p.A. are Twitter with 326 000 followers, Facebook with more than 40 000 followers and Instagram with 10 000 followers. ATAC S.p.A. actively uses these channels of communication but the very message and its frequency differs from channel to channel. Twitter is used for urgent notifications about changes in timetable, incidents, cancellations and the engagement of customers is quite low, most of the posts remain without comments, but at the same time the reaction of ATAC S.P.A. to the questions asked by customers is quicker and more frequent, Customers in twitter usually ask urgent questions about the state of the transport, do not express much their opinions, do not leave reports. In engagement of customers on Facebook is the highest of all ATAC S.p.A. social media platforms. On Facebook ATAC S.p.A. usually publishes announcements about upcoming events, ecological initiatives, implemented innovations. The post usually get from 30 to 200 comments and provoke discussion among followers without frequent comments from ATAC S.p.A. Instagram is not frequently used by ATAC S.p.A., posts get little comments and almost no discussion. All in all the customers express their opinions, proposals and complaints on ATAC S.p.A. social media platforms.

Table 4 shows the quantity and type of data collected through these social media, and then analysed to achieve the purpose of the paper. Also in this case, data have been collected with reference to three different exogenous scenarios, representative of the most frequent day types: normal working days, public strikes and festive days.

Table 4. Data collected through Rome's urban mobility social media platforms

Nature	Source	N. of records
Post	Facebook	4
Comment	Facebook	205
Post	Instagram	1
Comment	Instagram	14
Post	Twitter	95
Comment	Twitter	43
Comment	App	108
Post	Official Web Page	0
Comment	Official Web Page	0
Tot.		Posts = 100 Comments = 370

In order to systemize them, a SWOT analysis was conducted.

The main *strengths* of Roman public transport can be described in terms of continuous improvement. ATAC S.p.A. consistently takes measures to improve its services and infrastructure by introducing new fleet (with ecological hybrid vehicles) and opening new metro stations and itineraries of electric buses. ATAC

S.p.A. also promotes innovative sustainable ecological initiatives and the municipality of Rome supports several sharing platforms (both private and public), for cars, bike, moto and scooters, with several solutions based on full electric fleets. In order to promote and support these initiatives the Sustainable Urban Mobility Plan (PUMS) was developed in 2019. Also in Rome public transport rates are low if compared to the average of the European capital cities.

The *weaknesses* of Rome public mobility services can be divided in several categories. One of them is poor infrastructure, like dirty metro stations and old equipment that can lead to breakdown of facilities. Ecological problems are also a downside of Roman public transport – noisy vehicles and poor ecological state of the average public fleet that is one of the reason of air pollution in Rome. Undersized fleet together with uneven coverage and some inefficient public routes create major problems for citizens and visitors' mobility; another risk is currently related to COVID-19 pandemic – customers often complain about difficult social distancing and drivers and passengers who do not wear masks. Among other problems are unreasonable frequent strikes and unreliable and incomplete official mobile app.

In short, Ecological hazard and pandemic risks are the main *threats* for Roman public transport in the short run prospective. Implementation of new ecological norms can lead to a suspension of old fleet that do not meet new ecological requirements and hence can provoke a collapse in urban transportation system. Pandemic risks can cause limitations in public transport lines, more strikes and worsening of economic conditions.

The *opportunities* for Roman public transport consist in organization of comfortable infrastructure for passengers. It involves increase in the number and types of innovative sustainable ecological initiatives. Increase of the fleet will allow having a more widespread service, also improving the accuracy of the schedule and the perceived quality of the service. In times of COVID-19 pandemic it is particularly important because of the social distancing, which involves a strong reduction of seats in the vehicles. Another opportunity is the introduction of more efficient and sustainable public vehicles that can reduce the environmental impact, in terms of both air and acoustic pollution. Development of a brand new reliable and efficient mobile application, continuously updated about public transport schedules, routes, current position, possible problems, and offering a multitude of auxiliary services (ticket purchase, help centre chat, etc.) will have an impact on the citizen's quality of life and on the perceived image of the service. It is also important to deal with Covid-19 challenges providing more social distancing in public transport, taking measures to control wearing masks by passengers and drivers, to pay attention to visual information about pandemic response in transport and at the transportation facilities. The SWOT analysis described so far is presented in table 5.

Table 5. SWOT Analysis based on Urban Mobility Posts/Comments about Rome

Strengths	**Weaknesses**
- Innovative sustainable ecological initiatives (e.g. used plastic bottles for tickets machine; "ColoriAmoAtac") - New buses fleet - New lines of electric buses - Several car/bike/moto and scooter sharing platforms, also based on full electric solutions (public/private) - Low rates in comparison to the avareage of the Europaen capitals	- Poorly maintained and noisy fleet of public vehicles - Dirty metro stations - Limited number of public transports in comparison to citizens/city extension - The outskirts of the city are not always covered by public transport lines - Inefficient public transport routes - Difficult/impossible social distancing on public transports (risk connected to Covid-19 pandemic) - Dangerous drivers behaviours (bad driving, sometimes not wearing masks, etc.) - Long waiting times - Public transport schedule often not respected (mainly for buses) - Unreasonable frequent strikes - Unreliable and incomplete official mobile app in terms of time schedules, real-time updates, public transports routes and map representation, extra services offered
Opportunities	**Threats**
- Increase the number and types of innovative sustainable ecological initiatives - More efficient and sustainable public vehicles (fleet renewal) - Development of a brand new reliable and efficient mobile application, continuously updated about public transports schedules, routes, current position, possible problems, and offering a multitude of ancillary services (ticket purchase, help center chat, etc.) - More sharing solutions based on electric vehicles - More attention to social distancing due to the pandemic - More services and information provided to citizens and visitors in cleaner metro station	- Ecological hazard (ecological sustainability of the public fleet) - Prolongation of the pandemic in connection to limited public transport lines and possible strikes - Some lines or stations could be closed for the pandemic risks

5. Conclusion

In the last years, the rapid development of cities, along with the growth of urban population, has brought up many challenges for the organization of human urban mobility in the most sustainable and smart way. Effective urban mobility systems must be developed in accordance with the expansion of cities and their metropolitan areas. The high necessity for modern arrangements of citizens' movement leads to the need for searching alternative solutions to urban transportation systems alongside with inclusive and modern communication contact points. The main attention should be payed to environmentally friendly, accessible and cost-effective public transport. In this context, innovative solutions

have to be in line with citizens' demand of interactivity and with technological innovative solutions developed and widespread in the ICT market.

Indeed, public transport companies have to face new requirements. This article shows a comparison between the social media strategy of public transport management in Rome and Bucharest, based on the SWOT analysis built on the analysis of posts and comments published on social networks. Through these channels, citizens can express their wishes and dissatisfaction. The results show that in Bucharest, compared to Rome, public transport is not so developed in terms of social networks. One of the main differences between the two companies is that the transport company in Rome has all types of transport, including underground, while the company in Bucharest has only surface transport means.

Moreover, from the analyses carried out, it is possible to maintain that nowadays, citizens of large European cities are very active on social networks in terms of interactions concerning the possibility of improving services for the community.

A common result to both the cities considered is the lack of a systemic social media strategy, aimed at providing the citizens and visitors with updated and clear information available anytime and anywhere, alongside with a necessary improvement in the integration between new mobility solutions (e.g. electric mobility, bike, scooter and car sharing, mobility as a service tools etc.) and a renewed and sustainable fleet of conventional public transport services. Furthermore, the Covid-19 pandemic forces urban mobility systems to make efficiency improvements in order to minimize health risks.

As a main limitation, the present study refers to a limited number of social media posts/messages. Although the sample of data is not low in absolute terms (639 total records), in order to generalize the obtained evidence further research is needed to confirm the present results. A comparison with other European capital cities, using the same methodology and focusing on similar issues, would be also beneficial to the research in this field.

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Overview of smart governance: A new approach to Jambi city policy innovation

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Abstract

The concept of the smart city established as a solution of the urban complex problem. The goal of the smart city concept is modern urban management using technical tools that offer state-of-the-art technologies, considering the applicable ecological standards while saving resources and achieving the expected results. In line with this, the government needs to build integrated information, communication and technology services. Therefore, the government has legalized a regulation relating to smart city policy. In 2019, Indonesia introduce The Movement Towards 100 Smart Cities as the joint programs implemented by Ministry of Communication and Information, Ministry of Home Affairs, Ministry of Public Works & Housing, National Development Planning Agency and the Presidential Staff Office. The program aims to guide districts / cities in formulating Smart City master plans in order to further maximize the use of technology through digital transformation, both in improving community services and accelerating the potential resources that exists in each local government. Governments need to step up their efforts to fulfil the basic infrastructure needs of citizens, raise more revenue, construct clear regulatory frameworks to mitigate the technological risks involved, develop human capital, ensure digital inclusivity, and promote environmental sustainability. This article use qualitiative with descriptive approach to examines the state of smart city development in Indonesian local government especially in the aspect of smart governance that have been implemented through 2017-2020, which includes understanding the conceptualisations, motivations, and unique drivers behind (and barriers to) smarty city implementation, which so far contributed to the development of 50 innovation-based applications in the City of Jambi.

Keywords: *Smart governance, public services, digital transformation.*

1. Introduction

The rapid development of today's development, should be faced by preparing various strategies to deal with it, especially in the era of the 4.0 industrial revolution

characterized by increased connectivity, interaction, and modernization of technology and information that is able to change various aspects in human life. The 4.0 industry revolution gives the opportunity to mastery technology as the key to determining national competitiveness. Therefore, mastering technologies such as the *internet of thing, artifificial intelligence*, *human-machine interfaces*, robotic and sensory technology, and 3D technology will sustain development in the era of the 4.0 industrial revolution.

In accordance with the era of the 4.0 Industrial Revolution, the government needs to build an integrated information and communication technology based service *(e-government).* With the integrated system of the community will feel the impact and benefits of the advancement of Information technology and communication where the service becomes easy, fast, inexpensive, and quality such as facilities in the management of correspondence and licensing, ease in public complaints, transparency in public services, adequate transfortation means, and so forth.

The form of the program implemented by the Government through the Ministry of Communication and Informatics, Ministry of Interior, Ministry of PUPR, Bappenas and presidential staff office is the movement to 100 Smart City (hereinafter abbreviated to SC) which is a joint program of the Ministry. This Program aims to invite Kab/Kota can to plan the Master Plan SC in order to further improve the use of technology, both in improving service to the community and accommodating the potential contained in each region (www.kominfo.go.id).

Smart City is an application of the *internet of things (IoT)*. The role of the Internet to realize the concept of SC is so important to support the delivery of information and perform the action through the network with minimal human intervention, so as to perform various functions automatically. With the *Internet of thing* in the SC program will unite the community in a fast and precise service.

To overcome the problems faced by the community. Through the concept of smart city, make the government's auth can be more instant, and give impact to the community. The first step, smart city construction was prioritized in 24 cities with a benchmark of budget availability. The district/city is as follows:

Table 1. District/City Movement Program 100 Smart City in Indonesia

No	District	No	City
1	Banyuwangi	1	Tomohon
2	Lombok Timur	2	Sukabumi
3	Badung	3	Samarinda
4	Sleman	4	Bandung
5	Banyuasin	5	Semarang
6	Bojonegoro	6	Tangerang
7	Gresik	7	Bekasi
8	Sidoarjo	8	Bogor
9	Mimika	9	Cirebon
10	Kutai Kertanegara	10	Pelalawan
11	Siak	11	Makasar
		12	Tangerang Selatan
		13	Jambi

Source: *www.kominfo.go.id, 2020*

Jambi City is one of the cities that continues to develop the smart City program in every aspect of community life. The basic concept of development is efficiency in budgeting to provide effective public services, making it easier for people to obtain services using information technology. However, in its application each city has different problems including the city of Jambi, such as inadequate supporting infrastructure, the readiness of local government, one of them in terms of budget, and the community that stutters technology.

Smart City in Jambi has started since 2014 then. In the implementation, there are still constraints such as human resources limitation because not all regional device organizations have experts in the IT field. Another obstacle is the city of Jambi faced with considerable challenges such as a high population increase, less reliable transportation, as well as infrastructure that has not supported, the quality of public service that has not been in accordance with the expectations of society and the number of practice Pungli, and most importantly the challenge to the limited financial resources become a problem in order to realize the program Smart City (Smart City) in City Jambi. Based on the phenomenon that has been outlined, researchers are interested to study in more depth about this smart city program in a study titled "Review of Smart City Program implementation" in Jambi city in the Era of Industrial Revolution 4.0.

2. Theoretical framework

There are various definitions of Smart City. Smart City is basically a city management concept by combining all strengths in terms of human resources, natural resources, infrastructure and government by optimizing Information Technology, so that the city is able to make its citizens independent, participatory, comfortable and prosperous. This meaning has been stated by several researchers that a Smart City is a city that is able to manage all its resources to improve the quality of life of its citizens [3] [4] [5] [6] [2]. Giffinger, et al stated that Smart City is a city that has a good performance / appearance that has a forward way from the aspects of the economy, society, government, mobility, environment and life, all of which are built because of good cooperation and are determined by independent citizens. and high awareness [3]. Meijer also stated that Smart City is a city that invests human and social capital and infrastructure, both traditional and modern, to promote sustainable economic growth and improve the quality of life, through the management of natural resources wisely and participatory [3].

Some researchers say that Smart City has certain characteristics, but in general Smart City has the characteristics of Smart Economy, Smart People, Smart Governance, Smart Mobility, Smart Environment, Smart Living [3] [1] [8] [7]. However, it can be seen clearly that several research sources emphasize that one of the characteristics of a Smart City is Smart Governance, which will be an important focus in this research. Christian and Roscia added in their research the indicators of each characteristic of Smart City, where, for example, Smart Governance has indicators: Participation in decision-making, public and social services, Transparent Governance, political strategies and perspectives [1].

Table 2. Smart City Indicators According to Christian and Roscia [1]

CHARACTERISTICS	INDICATORS
Smart Economy	**Innovative Spirit**
	Entrepreneurship
	Economic Image and Trademarks
	Productivity
	Flexibility of labor market
	International embeddedness
	Ability to transform
Smart Mobility	**Local accessibiity**
	(inter)national Accessibility
	Availability of ICT-Infrastructure
	Sustainable, innovative and safe transport systems
Smart Environment	**Attractiveness of natural conditions**
	Pollution
	environment protection
	sustainable resource management
Smart People	**Level of qualification**
	Affinity to lifelong learning
	Social and ethnic plurality
	Flecibility
	Creativity
	Cosmopolitanism/Open-mindedness
	Participation in public life
Smart Living	**Cultural facilities**
	Health conditions
	Individual safety
	Housing quality
	Education facilities
	Touristic attractiveness
Smart Governance	**Participation in decision-making**
	Public and social services
	Transparent governance
	Political strategies and perspectives

Source: *Cristian and Roscia, 2012*

3. Research methods

The study uses a descriptive method with a qualitative approach. With this method the researcher seeks to describe the implementation of Smart City program in Jambi City in the revolution of the 4.0 industry by sampling as a research informant is the institution and apparatus involved in the implementation of the smart city program, namely the Office of Communication and Informatics City of Jambi which is located at Jln. Jend. Basuki Rahmat No. 1 Kota Baru Jambi – Indonesia 36128. Data is collected through observation activities, interviews and documentation. Then the data is analyzed with interactive models which include data reduction, data presentation, and withdrawal of conclusions.

4. Results and discussion

4.1.Implementation of Smart City Program in Jambi City

Jambi City has focused as a smart city, this program is beginning with the preparation of Master Plan Smart City of Jambi City in 2014, together with the element OPD, subdistrict government, government village, head of health centers in the area of Jambi city, as well as board Smart City of Jambi City consisting of all head OPD City Jambi, elements DPRD Jambi city and academics. After the technical guidance of the preparation of Master Plan Smart City Jambi City, the next stage is the implementation of smart city development which began in 2017 and still ongoing until now (2020) under the guidance and mentoring of the Indonesian IT Consultant Association (IKTII).

Service to the community began to be enforced with an IT system connected with all the OPD of Jambi city government. In order to improve the implementation of Smart city, Jambi city government has always coordinated with the head of SKPD to expose problems in the respective institutions that can be solved through technology so as to facilitate in serving the community.

In building and implementing Smart City, Jambi City is the first area in Sumatera has a City Operation Centre that is named Jambi City Operation Centre (JCOC). It is a space control of Jambi city which monitors the activities occurring in the City of Jambi, including having the function of monitoring the traffic by implementing the application of the Traffic Control System (ATCS). In addition to displaying the city information, JCOC also monitors public complaints through the SIUPSET app. To support the implementation of JCOC, almost every intersection in Jambi City already installed CCTV. In addition, from the implementation of the Smart city of Jambi City, is with the electronic traffic Law Enform (E-TLE) or called electronic ticketed. Jambi City is the second region to implement E-TLE in Indonesia after DKI Jakarta.

As proof of the success of the Jambi city government in implementing the Smart City program, the city government of Jambi gained appreciation from the central Government through the Ministry of Information and Communication as one of the 25 pilot areas (pilot project) of Smart City in Indonesia. In addition, the city government of Jambi also gained appreciation from one of the leading national magazines engaged in the IT and telecommunications field, IT Works, which initiated the Event TOP IT & TELCO 2018. The city of Jambi has been able to collect two awards, namely Top Leader on IT Leadership 2018 and Top IT Improvement 2018. In the year 2019, the city of Jambi also managed to get 3 awards at the Expo Smart City 2019 exhibition at Balai Sudirman Jakarta. The form of the award is capability Award and Implementation of Smart city governance in the form of Top Digital Implementation 2019 on City Government Level Star 4, Top Digital Transformation Readiness 2019, and Top Leader on Digital Implementation 2019.

Jambi Mayor Syarif Fasha in the 2020 Top Digital Innovation Award Awarding Ceremony confirmed that :

In implementing smart city, we always consider on the basis of need, to overcome various problems that exist in our city. We solve various problems with innovation, which we then apply in technology. Maybe this is different from other regional concepts that think otherwise(Statement of the Mayor of Jambi, Syarif Fasha in the Top Digital Innovation Award 2020 Awarding Ceremony, https://jambikota.go.id/new/2020/05/19/it-telco-2020).

That currently the city of Jambi has indeed transformed as a city that implements the concept of smart city well. Various government activities and public services have been implemented in the form of information technology-based service applications. The concept of smart city of Jambi City is also not separated from the industry 4.0 phase, which demands the utilization of information and communication technology in all aspects of community life, so it can provide benefits and facilitate all public activities.

4.2. New findings that have been applied in order to support the Smart City Program in the city of Jambi

To support the implementation of Smart City program in Jambi City, the city government has launched and has approximately 50 technology innovation applications to support the performance of the Government of Jambi and facilitate the process of service to the community. All these technological innovations can be accessed easily by the community.

The applications include E-TLE, Si upset (Online community complaints Information System), DISHUB Sign On, DISHUB Smart, Si Raja Koja (Information System procurement goods provision of Jambi city), licensing applications, United Nations Info Online, Applications Jambi City (information about the city of Jambi), digitalization archives, Digital clipping applications, and applications PPID (Public Information application). With the various applications of the community services, The Jambi City Government hopes that government services to the public can run effectively and optimally, and can respond to the challenges of the contemporary community to the needs of the service system is fast, integrated, inexpensive and efficient. Even to support Smart city in Jambi City, Jambi city government has built Fiber Optic (Fo) to facilitate and expand the coverage of telecommunication network. Based on smart city dimensions/indicators, as examples of such applications include :

Table 3. Jambi Smart City Applications

No	Smart City Variables	Applications
1	Smart Economy	Sikadd E-Promosi
2	Smart People	Sangkek Aplikasi PPID
3	Smart Government	Sikoja Sikesal Sipaten Sipadek Si Raja Koja
4	Smart Environment	Sippolling
5	Smart Mobility	Transkoja E-Parking E-TLE Dishub Sign On Dishub Smart
6	Smart Living	E-Silola E-Planning Aplikasi Perizinan

Source: *Research data, 2020*

4.3. Barriers and challenges faced in the implementation of Smart City Program in Jambi City

As one of Smart City, Kota Jambi performs various innovations by building integrated services based on applications in various fields, but in its application there are various obstacles and challenges. The barriers are limited financial resources, therefore one solution is to seek the participation of stakeholders in creating a smart city in Jambi. Other obstacles and challenges are the limitation of human resources in the field of information technology, because not all OPD have experts in IT field.

This was supported by interviews with the head of Jambi City Communication and Information Department, Mr. Nirwan that :

Jambi City has focused itself into a smart city. Service to the community is enforced using IT that is connected with all the OPD of Jambi city government. This is to facilitate service and minimize face-to-front between the officers and the community. However, there are constraints in its implementation, which is the limitation of human resources, because not all OPD have experts in IT field. To overcome that problem, we continue to provide mentoring (Interview with Mr. Drs. Nirwan, ME. Head of Jambi City communication and Information Department).

Other obstacles and challenges are the lack of readiness of the community in utilizing such application-based technologies. Even there are still people who do not know to facilitate the service and absorb the aspirations of the government of Jambi City has a variety of supporting applications. As the result of the interview with Nirwan :

Jambi city government already has dozens of applications, among them there are applications for the development planning of Jambi City, service applications, application of complaints and information (Interview with Mr. Drs. Nirwan, ME. Head of Jambi City communication and Information Department).

This opinion is in line with the direction of the Mayor of Jambi, Syarif Fasha in the 2020 Top Digital Innovation Award Awarding Ceremony which said that:

Innovation is a necessity that must be owned by an area to solve various problems that exist in the area and to bring services to the community. The innovation phase is already underway, and we have entered the technology phase. Technology-driven innovation will be a tremendous force in producing excellent service for the community. Currently, all local governments are competing to make innovations (Statement of the Mayor of Jambi, Syarif Fasha in the Top Digital Innovation Award 2020 Awarding Ceremony, https://jambikota.go.id/new/2020/05/19/it-telco-2020).

The opinion as researchers have outlined above. Therefore, Jambi city government is very concerned with the response given by the public to application of such technological innovations as a form of feedback for the government in conducting a improvement to the Smart City Program.

Conclusion

The implementation of Smart City Program in Jambi City has started since the year 2014 is in the order of Master Plan Smart City Jambi City. The implementation of Smart city development began in 2017 and is still ongoing until now (2020) under the guidance and mentoring of the Indonesia IT Consultant Association (IKTII). As proof of the success of the Jambi city government in implementing the Smart City program, the city of Jambi won the Implementation of Smart city governance at Expo Smart City 2019 exhibition at Balai Sudirman Jakarta.

Jambi City is one of 25 cities / regencies in Indonesia chosen by the Ministry of Communication and Information of the Republic of Indonesia, to become a pilot project for implementing smart cities in Indonesia. Various government activities and public services have implemented various information technology-based applications. The Jambi City Government has launched various applications to support the performance of the Jambi City Government and to provide public services. Jambi City is also the first area in the Sumatra region to have an integrated City Operation Center (COC) room, where the city control and monitoring functions are integrated with other control functions, such as the traffic monitoring system (ATCS), monitoring of public complaint services (Application SIKESAL), as well as various other community service functions. Jambi City is also the second city in Indonesia, apart from Jakarta, to implement Electronic Traffic Law Enforcement for the first time through E-TLE (electronic ticket).

n support of the Smart City Program in the city of Jambi, The Jambi city government has launched and has approximately 50 technology innovation applications to facilitate the process of service to the community. All these technological innovations can be accessed easily by the community. However, there are several challenges faced in implementing the Smart City Program in Jambi City is a limited financial resources, limitation of HUMAN resources in information technology, and lack of public readiness to utilize application-based technology.

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Smart city cyber-physical security

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Abstract

Recently, the number of Internet users has increased enormously, this becoming the main way in which states and non-states actors increase their economic and diplomatic capacity through strategic and targeted manipulation with the help of web content that they transmit to citizens. Brilliant urban areas have a bleeding edge obligation to guarantee a protected and safe physical and advanced environment advancing durable and feasible metropolitan improvement for the prosperity of EU residents. S4AllCities incorporates progressed mechanical and authoritative arrangements in a market situated brought together Cyber – Physical Security Management structure, targeting raising the strength of urban communities' frameworks, administrations, ICT frameworks, IoT and cultivating insight and data sharing among city's security partners. A smart city is made up mainly of information and communication technologies (ICT) to develop, implement and promote the practice of sustainable development to address the growing challenges of urbanization. Mostly, ICT is a smart network of objects and machines that are connected and transmit data using both wireless technology and the cloud. IoT-based and cloud-based applications receive, analyze, and manage data in real time to make a good decision about quality of life. People use Smartphones, mobile devices, cars and smart homes for smart city ecosystems. Communities can improve energy distribution, streamline garbage collection, reduce traffic congestion, and even improve IoT air quality. This paper fills a gap in the literature dealing with attacks on critical infrastructure in smart cities and presents envisioned pilots for 3 cities in Europe, as well as experiments in follower cities, one of them being Buzau in Romania.

Keywords: *ICT, wireless technology, urbanization, IoT, CPS, city safety.*

1. Introduction

The notion of smart city is considered a massive one, covering the administration and integrity of the entire configuration with the help of built-in technology. In this situation, surveillance is performed by cyber security, bringing together all components of the configuration, including administration, governance, citizens, healthcare, society, the education system and the environment, using ICT. [7] Cyber security is often described as digital or ICT technologies, which are used by a smart city to improve features and services to make costs more efficient and used resources. [6]

Increased advances in ICT must lead to improved management, operations, and the environment in several ways. As a result, issues related to advanced smart cities are becoming increasingly difficult. This is due to the rate of change which is quite high. This leads to the need for up-to-date technologies and intense web research to bring about organizational change. To gather personal details about people, you can use applications and social networks. [27]

In 2013, it was estimated that in 2020, the global market for smart city solutions will reach $408 billion, according to The Department for Business

Innovation & Skills of the UK, which means that smart cities will represent approximately 24% of the global market. In 2020, the real amount reached $410.8 billion and is estimated to grow to $820.7 billion by 2025 in just 5 years. [12, 31]

As common platforms with services and tools are absent, this prevents the efficient development of the associated ecosystem. A platform has been developed, Smart Citizen Service, which classifies the market into integrated video surveillance, in-vehicle cameras, intelligent healthcare, security and threat management, and intelligent education.

Due to the growth of the urban population, new market opportunities are generated for those in the industry who want to meet the requirements of the Smart City market. A major growth factor in the smart city market is the manifestation of governments' interests for platform providers over independent smart solutions. Some of the major players in this market use their own platform to provide this type of service, Smart City services. Some of these platforms are: CityIQ by Current; Cisco Kinetic by CISCO; OceanConnect by Huawei; Hitachi Vantara by Hitachi; CityNext by Microsoft; IMPACT IoT platform by Nokia; City Intelligent Platform by Siemens.

Technological developments have increased the complexity of the relationship between the cyber domain and the physical domain in many application domains, i.e. manufacturing, healthcare, transport, automobiles, etc. [2]. This complex interaction requirement leads to efficient integration of the cyber domain and the physical domain by Cyber-Physical Systems (CPS) [23]. CPS is a deeply connected communication network in which, as seen in Fig. 1, many embedded computing devices, smart controllers, physical environments, and humans communicate systematically with each other [24, 28].

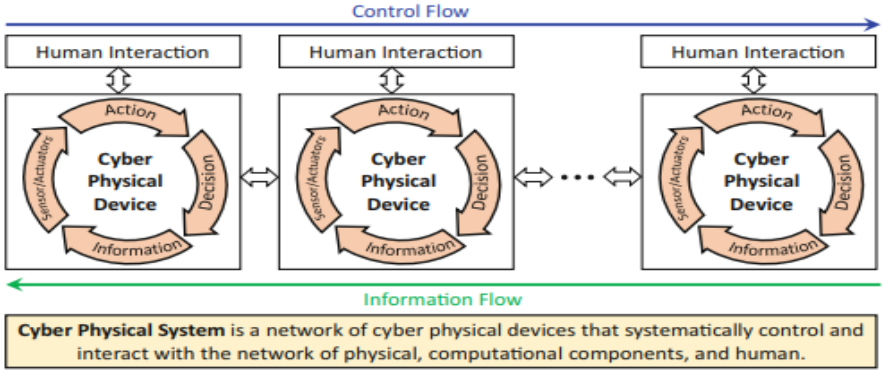

Fig. 1. Key features of a CPS
Source: *[11]*

Usually, by sharing the information and communicating the appropriate control commands, CPS systems communicate with each other. CPS uses sensors to collect data from the physical domain and analyze it by controllers to issue the control commands required to guide/control the physical domain via actuators. The complex and massive integration with humans of networked computing equipment, sensors and actuators in CPS plays an important role in the growth of the Internet of

Things (IoT), in which various cyber and physical (sub)-systems are connected over the Internet [11, 15]. IoT has revolutionized many application fields, such as smart traffic control, healthcare, transport networks, industrial automation, smart grids, autonomous vehicles, and smart homes/buildings due to their ability to manage such complex interactions (as shown in Fig. 2).

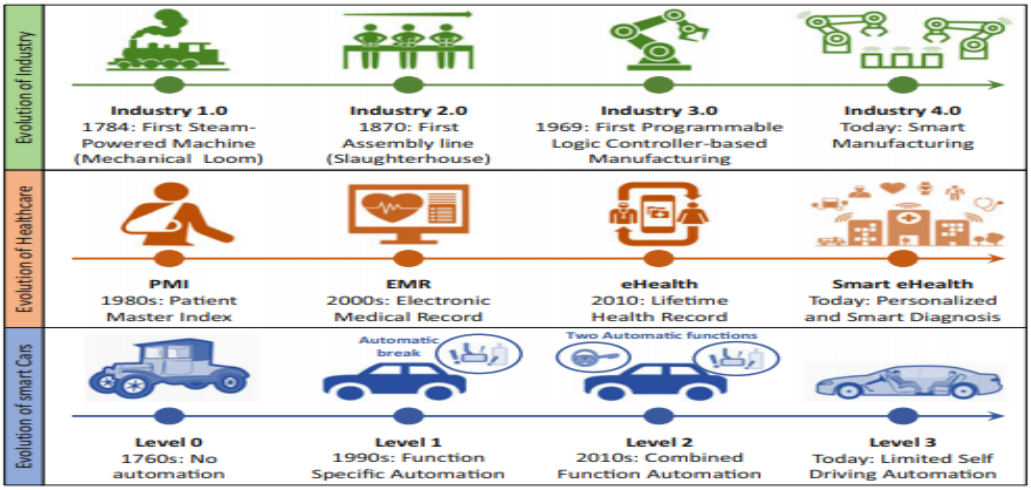

Fig. 2. Timeline of the technological advancements in different applications
Source: *[15]*

In relation to its use in the corresponding industries, the scope and use/opportunities of IoT differ (as shown in Fig. 3). For example, many application fields, such as multimedia, manufacturing, financial firms, etc., used the IoT in several of their applications in 2017, primarily in protection and surveillance, resources, and asset management [21] (as shown in Fig. 3).

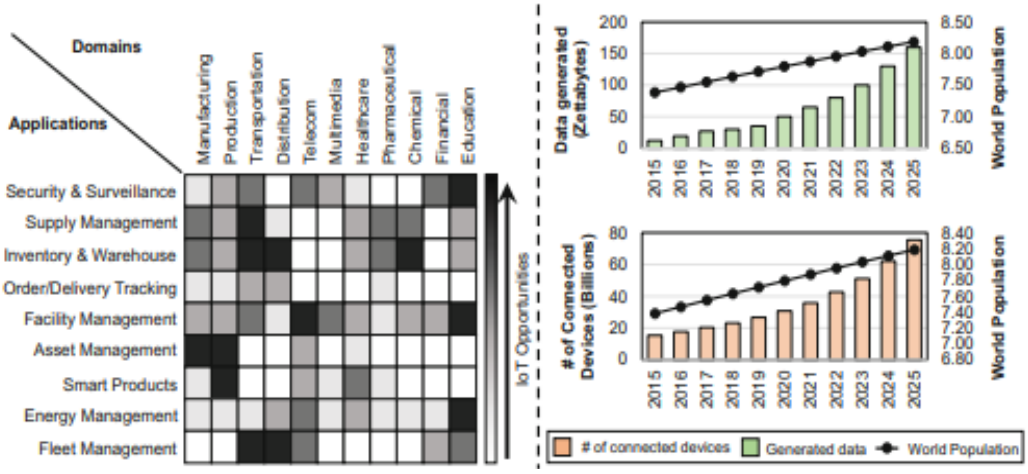

Fig. 3. On the left, a heat map shows the opportunities and scope of the IoT for different applications
Source: [*21].*

The following challenges are coming with the extensive use of IoT in industries, especially in safety-critical applications:

1. One of the main challenges is dealing with the enormous amount of data generated that needs to be stored and processed. An analytical survey by the ”Statista” group for example, indicates that by 2025, almost 75.42 billion connected devices will be used, producing approximately 180 zettabytes of measured data [33], as shown in Fig. 3.
2. CPS is vulnerable to multiple security threats due to the dynamic convergence of the cyber domain (i.e. networked computing devices), physical domain (i.e. actuators) and humans [18, 25]. Therefore many real-world security incidents have been documented. Blocking the city water pipeline [4, 32, 34], hacking the pacemaker [3, 13], anti-lock braking system [29], wheel speed sensor spoofing in smart cars [20, 30], relay attacks (to disable lights)[9] and other industrial attacks [1, 19, 22] are some of the prominent incidents. These incidents allow researchers to answer the following main research questions:
   - How to ensure secure data acquisition from sensors?
   - How to ensure the security of the controllers and corresponding control signals over different CPS layers?
   - How to ensure secure inter-layer, intra-layer, and stack communication of data and control signals?

Researchers have suggested multiple security measures to answer these research concerns, i.e. online identification of anomalies [16, 35], anonymization [11], trusted computing (attestation) [10, 26], data and control signal encryption [8] and verifiable computation. However, the growing number of connected devices and the corresponding data, and resource constraints, make it very difficult to develop safety measures, especially in CPS battery-operated devices. Therefore in order to cope with volatile operating environments over a lifetime, protection measures in the CPS need to be energy efficient yet adaptive and sustainable. In addition, these security mechanisms need to be sufficiently intelligent to adjust to the unexpected attack surface for sustainable stable CPS.

2. Smart city

The goal of this work is to recognize the key trends in scientific literature characterizing smart urban mobility. "Smart city" is currently the most "in vogue" term among academics and administrative/governmental representatives from all over the world that has been discussed and examined. This multidimensional concept is focused primarily on smart technology structured around a few main elements: smart mobility, smart environment, smart governance, smart living, and all that targets the well-being of people. Due to its major effect on the environment through emissions as well as living by needing intelligent transport systems, this work focuses on a hot subject: mobility. A significant topic of modern cities is addressed, namely smart mobility, presenting the key problems and potential solutions, as well as the stakeholders involved and responsible for their implementation.

In recent years, the idea of a smart city, especially smart mobility and intelligent transport systems, has become very common. The authors began verifying the number of publications available in the Web of Science and Scopus databases to examine current research trends among publications dealing with urban smart mobility or the Intelligent Transport System (ITS) (Fig. 4). A study of the number of publications after 2000 was carried out by the scientists, when the number of publications surpassed seven in the Scopus database and two in the WoS database.

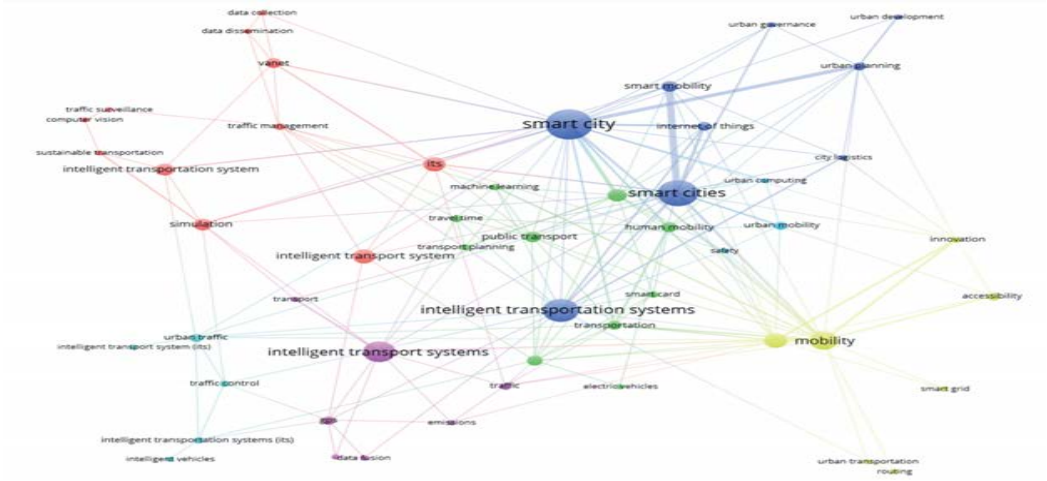

Fig. 4. urban smart mobility or intelligent transport system
Source: *[12]*

3. PS security

A conventional security framework tests the conduct of adventure contact and other side-channel constraints. Nevertheless, these procedures do not apply to cyber-physical systems (CPS) for intricate interdependencies on different layers, exclusively reservations in physical layers [28, 14]. For example, Table 1 illustrates some of the real-world cyber-physical systems (CPS) attacks that exploit the weaknesses at different cyber physical systems (CPS) layers. Subsequently, old-style definitions for threats and consistent threat models cannot be used to examine and progress security measures in cyber physical systems (CPS) [17]. Hence, here in the chapter, we elaborate security exposures in cyber-physical systems (CPS) at different layers of CPS, particular payloads, and linked threat models.

3.1 Security attacks in CPS

The security attacks in CPS differ from traditional cyber attacks to cyber-physical attacks that exploit the vulnerabilities at different CPS layers [5, 28, 36]. Characteristically, these vulnerabilities are characterized based on the cyber-physical systems (CPS) layers. Figure 4 shows different security attacks for CPS with respect to various cyber-physical systems (CPS) layers.

Table 1. Examples of the real-world security attacks on different layers of CPS

CPS layer	Applications	Attacks	Description
Sensors/Actuators	Smart grids	False data injection	Interrupt the data acquisition by feeding false data to sensors
Network	Smart grids	Cyber extortion	Hack and exploit the CPS component that can connect to Internet [37]
Sensors/Actuators	Control system	False data/Signal injection	Corrupting the sensor data (sensors) or control commands (actuators) [38, 39]
Network	Control system	Replay attacks	Hack the network to delay or corrupt control commands [40]
Network or physical	Smart grids	Aurora experiment	Maliciously interrupt brakes [41, 42]
Network	Smart healthcare	False data injection	Corrupt the patient record [43]
Physical	Smart healthcare	Unauthorized injection	Remotely send the false commands to insulin injection pump [43]
Network	Smart cars	Denial of service	Disable the communication with brakes [44, 45]

Source: *[5]*

4. Designing a secure CPS

The above-mentioned security vulnerabilities increase thoughtful alarms over the usage of cyber-physical systems (CPS) in safety-critical applications, like smart home appliances, autonomous vehicles, smart healthcare, industry 4.0. Consequently, there is a compulsory need to develop security measures that are adaptive to unanticipated attacks and bearable enough to deal with long-term influence of environmental changes and technological developments [24].

In short, to design sustainable and secure cyber-physical systems (CPS), the mentioned research challenges must be resolved:

Inclusion of the security in design constraints: Multiple security measures for cyber-physical systems are being put forward so far, but security is not contained within the design constraint in cyber-physical systems design cycle. Consequently, it is domineering to integrate security constrictions into traditional design constraints.

Resource-efficient adaptive design: The complex interaction and integration of physical-domain and cyber-domain make cyber-physical systems extremely vulnerable to unexpected attack surfaces. Furthermore, the restricted resources (in battery-operated CPS) also limit the runtime security measures. So, it is domineering to develop such security measures that are adaptive and also accomplish the energy budget and resources constraints.

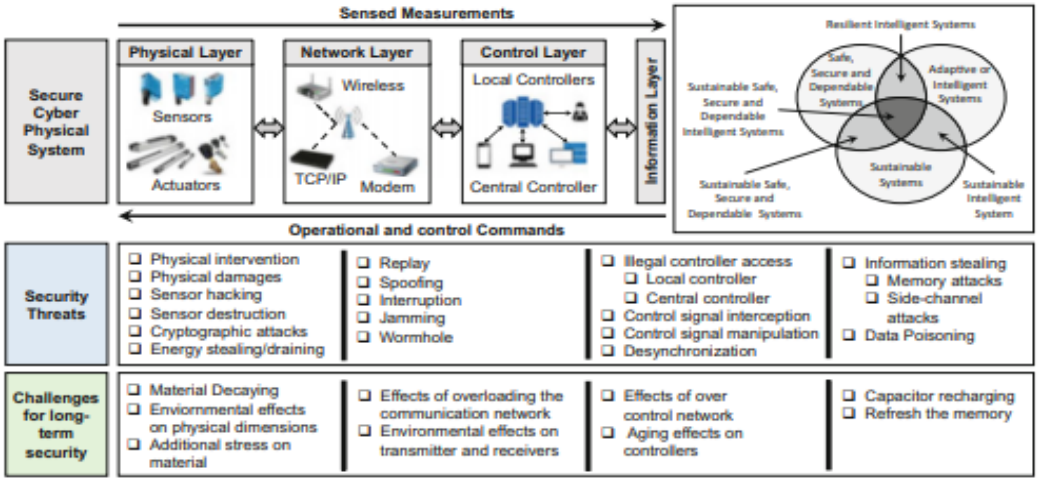

Fig. 4. Security attacks for CPS with respect to several CPS layers and associated challenges for long-term and sustainable security measures for CPS
Source: *[24]*

Secure communication: To design a secure cyber-physical system, it is imperative to guarantee the secure interaction and integration of numerous heterogeneous cyber-physical devices.

Data confidentiality: Information and control signals are an integral part of cyber-physical systems. Thus, it is imperative to ensure the protected communication and storage of the information and control signals.

5. Conclusion

The paper focused on smart cities, how they have developed in recent years, estimates in this area and how it will develop in the future. Most smart cities are made with the help of ICT, without whose help one could not develop, implement and promote. For the related work part, the security of the CPS was taken, a conventional security framework; described security attacks and how they differ from traditional cyber attacks. Also for the related work part, there was talk about designing such a secure CPS.

Acknowledgements

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Improvement of the quality in smart toilet

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Abstract

The development of people in society is influenced by social and economic factors in everyday life, which is why any age group and type of people must be included in our environment and must be offered the independence necessary for a normal life. The focus is on the elderly and disabled people. For helping them, we offer smart toilets, so that they no longer have to worry about basic needs, feeling safe and free to visit places such as malls, hotels, cinemas and concerts. To achieve this goal, the quality of public spaces and the quality of public bathrooms should be improved. Using high technology, this paper aims to develop an intelligent toilet system, especially for the elderly and people with disabilities. In addition to all the benefits of this smart toilet, an air quality monitoring system can be included to start cleaning procedures. It has been shown

that humidity, temperature, amount of water, VOC, O_2 have a great impact on human health. The study began in the iToilet project, which developed a solution that led to a prototype for home use including the ability to adjust the position and height of the toilet and other auxiliary means using several different technologies. Moreover, it was necessary to develop this concept in public spaces, and the Toilet4Me2 project made this possible by exploring and implementing this concept. Furthermore, the Toilet4Me2 system includes an armrest, vertical adjustment mechanisms, tilting lift function and a shower unit, along with emergency identification and detection facilities, plus optional supplements. These facilities are dedicated to elderly and / or disabled users, either able to walk or in a wheelchair.

Keywords: *Smart Toilet, air quality, elderly and disabled people.*

1. Introduction

People's daily life has a major social and economic impact on their development as individuals in society. This is the reason why all the categories should be integrated into our living environment, giving them a chance to be completely independent. The most vulnerable persons are the elderly and people with disabilities. They depend partially or entirely on someone's help, thus affecting their desire to participate in social events or even leave their homes [1]. Smart toilets are playing an important role in daily life, especially in public spaces. There was an essential requirement for the comfort of the user when they were using the smart toilet: self-reliance and autonomy. The lack of attention for public areas can lead to isolation, resulting in this way wider consequences like depression, loneliness and low self-confidence. Providing public smart toilets becomes a necessity due to their accessibility, cleanliness, maintenance, easy design and hygiene. Using this type of toilet, they don't have to worry about basic needs, feeling free to visit places like malls, hotels, cinemas and concerts [2].

To reach this goal, the quality of public spaces, respectively, the quality of public bathrooms should be improved. Using high technology, it can be developed a toilet system which will increase the comfort of using a bathroom. Toilets are an important factor in hospitals, grocery stores, different types of industries, restaurants, etc., because the employees' health improves.

This article is based on the study done in the first project, iToilet, where smart toilets targeted the private environment. Subsequently, the research expanded, reaching the current project, Toilet4me2, in which smart toilets are adapted for the public environment, thus helping people to become more independent and want to go out for various activities.

This paper proposes a smart toilet prototype that is addressed especially to the elderly and people with disabilities. The toilet is designed for public spaces and can deliver a safer and cleaner environment for the users. The used technology allows services like height and tilt lift, arm support, shower, remote control, voice control, emergency detection, personalized setting, self cleaning and automatic light

and door lock. Also, the system includes a number of sensors used for air quality monitoring. Based on these parameters values, the self-cleaning decision will be made. For system testing, a series of questionnaires were used.

In addition, for the analysis of the air quality in the toilet, the coarse particulate matter (PM_{10}), which is less than 10 micrometers in diameter, fine particulate matter ($PM_{2.5}$), which is less than 2.5 micrometers in diameter, humidity and temperature. However, the exposure of SO_2 on human inhalation for asthmatic people in a concise time at concentration gives more significant effect to trigger the asthmatic symptoms compared to PM_{10} and $PM_{2.5}$ [3]. Asthma is a heterogeneous disorder of the conducting airways involving chronic inflammation, declining function and tissue remodeling. The inflammation causes wheezing, breathlessness, chest tightness, and cough for asthmatic individuals, particularly at night and/or early morning.

The rest of the paper is organized as follows. Section 2 explores the state of the art of smart toilet systems. Section 3 discusses the Internet of Things sensors and their benefits. Section 4 investigates the relevant instruments of the system architecture and platform. Section 5 brings conclusions and explains future work.

2. Related work

There are already some smart toilet systems, and the solution proposed in this article comes in addition to functions that existing systems do not have. In the following paragraphs will be briefly presented some solutions already implemented.

One example already implemented is a smart toilet system that uses IoT sensors (odor sensor, IR sensor, sonic sensor and RFID sensor). This intelligent toilet system will perform the following functions: closing and opening the toilet lid, the infrared sensor tracks the dirt accumulated in the toilet and will trigger an alarm. After activating the alarm, the cleanliness of the toilet will be improved by monitoring the activity of the sweeper. Also, this smart toilet system will reduce water consumption [4].

In another article, the main control of a smart toilet is done through a screen that can be controlled by eye movement or by clicking on a hologram similar to the screen itself. This panel can also control air purifiers, internet connection but also music player, thus creating a safe and clean environment improving the health of employees. Before leaving the toilet, a warning message will be sent in case the user has not washed his hands. After using it, an automatic cleaning will be done where the seat will be sanitized, but also the adjacent components. Due to the major problems identified within the urban sanitation systems, solutions have been proposed that must be considered in order to solve them using smart and green urbanism practices with some innovative designs [5].

Another existing example includes an intelligent toilet system that measures certain physiological parameters, such as: ECG, bioelectrical impedance, body fat ratio and body weight. Also, this intelligent toilet system offers the function of health management. Bioelectrical impedance and ECG are measured using electrodes mounted on the smart toilet seat. These measured parameters are sent to an online platform via Bluetooth and certain graphs can be made to monitor health [6].

Another example of an intelligent system already implemented is for public toilets, which are constantly facing a lack of hygiene. In order to replace the hiring of a man to take care of hygiene monitoring, an intelligent automated system was used. IoT sensors were used to measure the water level in the tanks, to find out what the water is used for, or to detect the presence of a person in the toilet. With this data transmitted to the platform, graphs can be made and the cleanliness of the toilets can be predicted. The sensors are connected to the Raspberry Pi, which processes the data and uploads it to the Cloud [7].

3. IoT sensors devices

Special air quality control devices are effective in finding the source of pollution. These tools are used to detect areas that cause allergies or similar symptoms. They can successfully detect temperature, humidity and different pollutants. Indoor Air Quality (IAQ) is a terminology of air quality within and around buildings which is pertinent to the health and comfort of the indoor occupant. The duration of time that people spend in the toilet and the risk to health posed by indoor air are the issues that encourage researchers to conduct the study on indoor air.

For analysis of the air quality inside the toilet room, it is necessary to install the following devices: monitoring unit of toilet maintenance air quality and thermal comfort unit. In Fig.1 is presented the diagram of a smart toilet in our concept.

Fig. 1. Schematic diagram of toilet environment

The monitoring unit of toilet maintenance allows access control, temperature, humidity, pressure, the time spent in the bathroom, if there is a flood, the amount of water consumed, and luminosity [8]. Air humidity has a few health effects. In case of too low humidity, unwanted effects such as skin dryness, eye irritation and respiratory problems occur. A moisture level above normal (45% - 55%) favours the

appearance of mold and fungi that affect humans, walls and furniture. If humidity is high, problems such as rheumatism, allergies and respiratory problems occur.

The sensors that can be mounted on the monitoring unit are:

- Temperature, humidity and pressure;
- Luminosity;
- Water amount consumed
- Liquid level (flood)
- Time spent in the bathroom – as a system alarm

4. Architecture of the system

The amount of time spent in the toilet and the health risk of indoor air are the biggest problem that encourages researchers to carry out the study of indoor air. In addition, humidity, temperature, oxygen, VOC and CO_2, which may have adverse effects on humans inhalation, such as asthmatic symptoms. However, the exposure of humans breath to VOC for asthmatic individuals over a short period has a significant effect on triggering asthmatic symptoms. Asthma is a heterogeneous airway disease involving chronic inflammation, remodelling of tissues. For asthmatic individuals, inflammation causes wheezing, lack of air, chest pressure and cough, especially during the night or early in the morning.

Air humidity has several effects on health. If humidity is high, there are problems such as rheumatism, allergies, and respiratory problems. Thus, the following precautions are required: proper ventilation of the toilet, hygienic conditions, and installation of indoor air quality sensors to have greater accuracy and correctness regarding the level of indoor pollution. A smart toilet indicates the status of our one's own health by using all of the sensors installed in the bathroom can help to reduce fall injuries, or respiratory problems that usually occur with the elderly people. For this reason, we propose a smart device equipped with gas sensors suitable for use as a pollution analysis system. Its utilization will revolutionize the existing methods of screening and keeping track of one's health status, for it opens a platform where toilets can be an ideal place to perform a daily check up of the cleaning especially on a daily basis.

The acquisition platform is composed of modular acquisition nodes (Waspmotes) and the Meshlium device, which acts as IoT-Gateway. The data acquisition modules connect via 4G / WiFi to the Internet or another (private) network to which Meshlium is connected and sends data to it. Once parsed in the Meshlium, the IoT gateway stored the data in a MySQL database that ensures local persistence of data. Sending data to Cloud is done through a software component that serializes data to an MQTT broker. Next, the Adapter component (a software application developed in Python programming language), is basically an MQTT client that subscribes to several topics and stores the data received from the sensor in the database [9]. Data visualization is then realized with an open platform for analytics and monitoring, Grafana. The data flow architecture is presented in Fig.2, and in Fig.3 can be observed the Libelium air quality monitoring node installed at the site location. The Libelium data logger is configured to measure and send data at 15 minutes intervals.

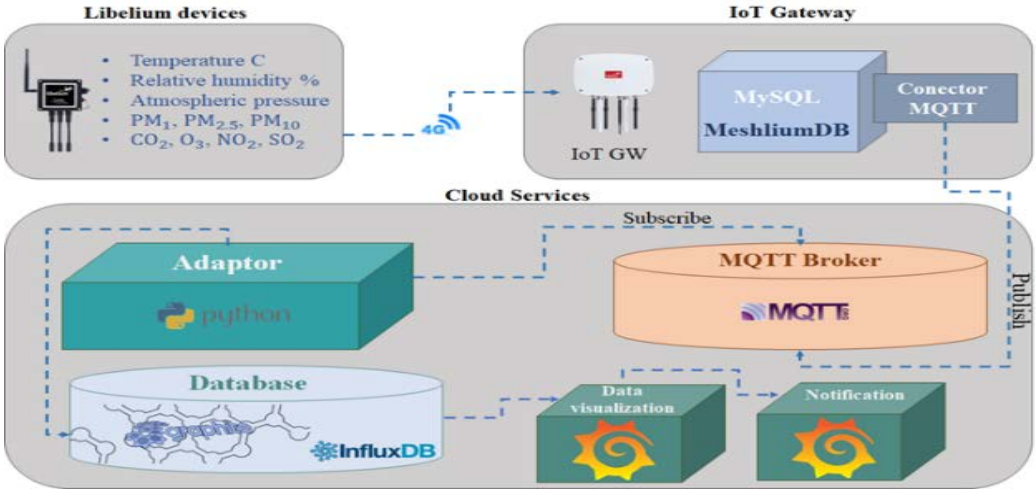

Fig. 2. Data flow architecture

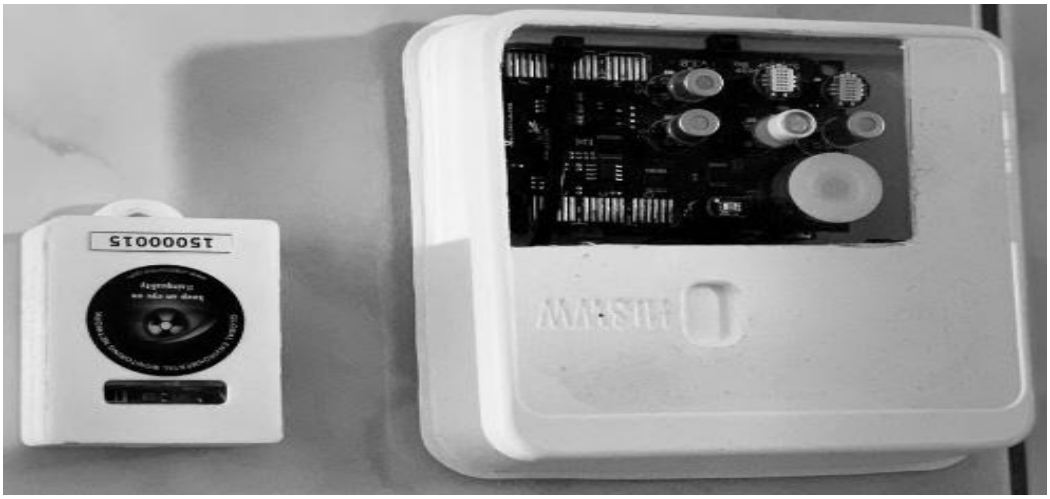

Fig. 3. Monitoring sensors

The overall reference architecture for transmission of data from Air quality monitoring unit and monitoring unit of toilet maintenance will be a Big Data based architecture for IoT devices and will include communication protocol between the server and the platform: MQTT and HTTPS.

These are the communication/ integration options of the smart toilet used and will depend on several factors:

- Temperature, humidity, pressure, air quality parameter
- Alert when the level of water increase, entrance sensor
- Battery: periodicity of the communication

5. Conclusion

In conclusion, improvement of the air quality in a smart toilet for elderly and people with disabilities can provide new enterprise and business solutions for the barrier-free tourism area. The need to study in-depth the innovations and new markets and, possibly, the development and evaluation of prototypes in real life is a step towards introducing older people or people with disabilities into everyday life.

Projects like Toilet4me2 may contribute to a positive development in thinking about shaping public and semi-public spaces to enable older people or disabled people to better participate in public life.

As future work, we plan to implement new sensors so that the smart toilet can be connected through an application on the users' smartphones to enable/disable certain functions of the smart toilet and collect data from it. This way, we can create a database using that data and improve the developed prototype's design based on the information obtained from the users.

Acknowledgements

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Visible light communication for smart cities

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Abstract

Objectives
This paper presents the results of Hybrid-VLC/IR-RF project that can be applied for secure communication using optical spectrum in smart cities. Experiments using this novel communication system is presented inside buildings and applicability for inter-building smart city applications is evaluated

Prior work
Some previous work has focused on integrating new hardware components specific to the VLC/IR-RF hybrid communications system and a brief description of the architecture of the communications system has been presented in a paper at CYSEC conference.

Approach
The paper presents the case study about new ways of implementing the communication interfaces following the improvements that have been made to the VLC/IR-RF laboratory test bench from the hardware and software point of view. Also, performance evaluations in various environmental conditions are presented.

Results
The experiments present integration at prototype level as a test bench for the hybrid VLC communications system. As such, sensor configuration is performed on IoT (Internet of Things) devices and a mobile application is developed for receiving data over MQTT (Message Queuing Telemetry Transport) protocol.

Implications
The practitioners can use this solution for communication beyond WiFi/5G radio spectrum where secure communication is needed in harsh

environments, for example underground metro, electromagnetic shielded/smogged spaces.

Value

The paper presents original work for next generation communication solutions beyond existing wireless communications such as 5G. The attention is focused on the intensive testing of the optical communication system within buildings where SMEs operate, as well as on the evaluation of its functionality for smart cities telemetry.

Keywords: *IoT, security, VLC, optical communication, sensors.*

1. Introduction

The scope of this project is to obtain an intelligent mechanism comprised of an integrated, multifunctional module with IR (infrared) sensor as compact as possible named microbolometer [1]. We target increased performances, reduced costs of implementation and energy [2]. In this paper it is presented the Hybrid VLC/IR-RF project which focuses on these requirements. The micro-bolometer [1] integrated in the VLC device has the function to measure a thermal map. It presents increased sensitivity and reduced energy consumption. In this way, VLC IR RF will be capable of multifunctional detection regarding monitoring of energy usage and ambience control [3].

The structure of the paper is as follows: Section 2 presents the architecture of the system, Section 3 the structure of the Hybrid VLC/IR-RF system, Section 4 presents the The contribution of the hybrid VLC / IR-RF communication system from the point of view of the SmartCity concept, whilst Section 5 concludes the article.

2. Architecture

VLC IR RF's function is to monitor energy consumption and to control ambiental parameters in homes, buildings, offices. This device will be able to run a processing algorithm based on artificial intelligence, therefore it needs computation power and reduced energy consumption, for example to count people or objects, to make difference between more objects, detect energy leakage [4]. Through this project, Beia Consult International contributed to developing, testing and implementation at a large scale of a hybrid system based on VLC-IR/RF communication. This system is compatible with video cameras and embedded devices which function with reduced energy. The hybrid system will be further improved, so in a few years will support building-to-building optical communications [1].

Fig. 1 presents the architecture of the system, which comprises: LED matrix, TX Unit and RX Unit development boards, VLC communication channel.

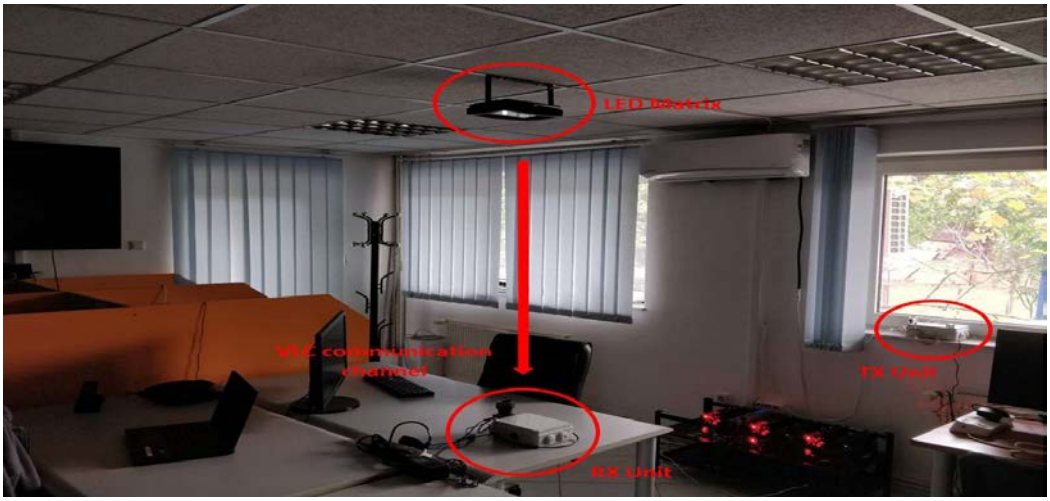

Fig. 1. VLC/IR RF System Architecture

To answer requirements from more business areas, we focused to reach a testbench level in developing the VLC/IR-RF system, to understand the principle of VLC operation, to analyze the effects and if they cause disturbances. The research team involved in this testbed had focused on the number of data packets not received when testing a connection based on an error-correction-free coding method (Fig.2) [2].

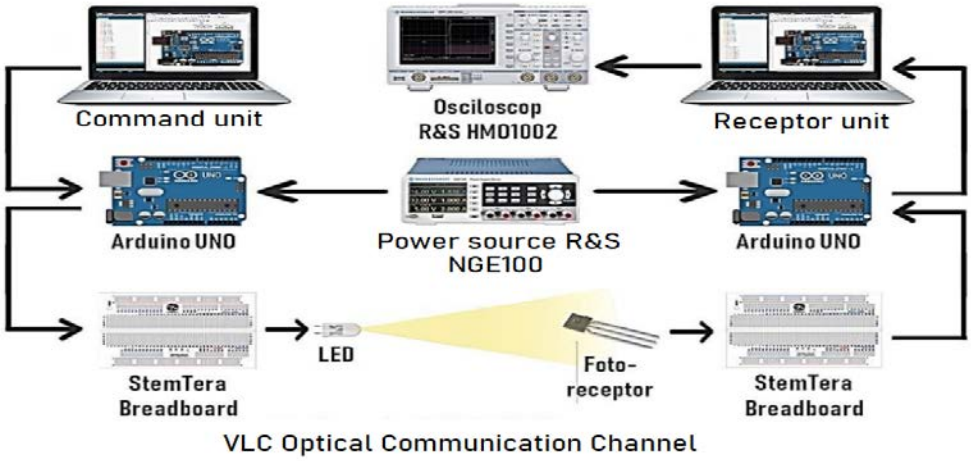

Fig. 2. VLC IR RF TestBench

The focus is to obtain superior transfer rates. Beia Consult International partnered with the National Center NanoFab, Korea, to develop a communication system VLC-IR/RF for answering specific business requirements. Developing and testing the intelligent control system took place at Beia Consult International.

3. Structure

As shown in the picture, the hybrid system VLC IR RF is made up of the following components:

- VLC/IR-RF transmission unit;
- High power LED matrix;
- VLC/IR-RF reception unit;
- Micro-bolometer sensory unit. The micro-bolometer sensory unit was brought to this project by Korean NanoFab National Center. The micro-bolometer acquires thermic images.

3.1. Transmission Unit

The transmission unit can be seen in Fig. 3. Each sensory component used for the transmission unit is described as following:

- LM35 temperature sensor module is used for detecting the moment when the ambient temperature does not fit in the value range declared.
- TSL235R professional light sensor does continuous supervising of light intensity in a certain area. The main scope of this sensory module is the guarantee of a high level of safety of the employees which stay in this area.
- PIR HC-SR501 movement sensor module supervises working areas after termination of work.
- GP2Y1014AU0F dust particle sensor monitors dust concentration inside the testing lab of the communication system;
- Noise detector sensor module which functions after termination of working hours aims for high level of safety in the laboratory.
- Micro-bolometer sensor module which detects detects movement and ambient temperature. In the research laboratory is needed movement monitoring [2].

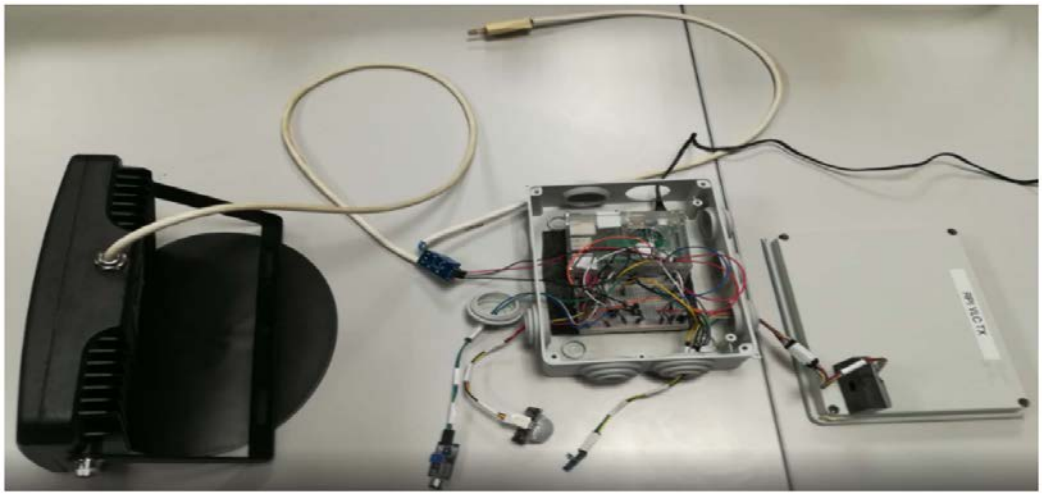

Fig. 3. Transmission unit

The hybrid system VLC has dedicated modules (developed by Beia Consult International Bucharest) that make possible installation of the sensors mentioned in the minicomputer Raspberry Pi 3B+.

3.2. Reception Unit

The photo-detector ThorLabs PDA10A (see Fig. 4) can detect a large range of light radiation values even values close to femtowatts. This photo-detector is embedded in the Receiver module.

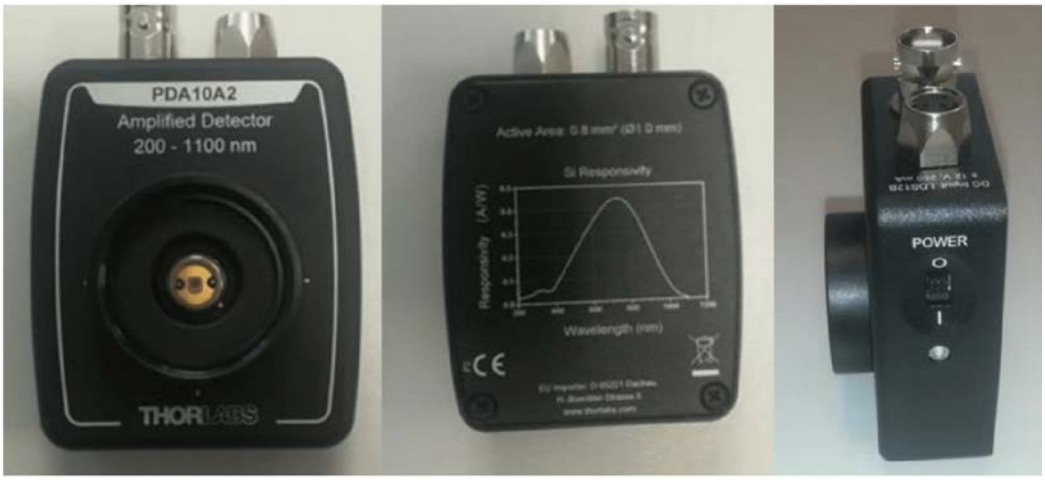

Fig. 4. ThorLabs PDA10A

Because the light received from the LED matrix must fall directly on PDA10A's photo-sensible surface, photographic type optical lenses will redirect the matrix light to it. They can be seen in the Fig. 5, integrated to the Receiver TX.

Fig. 5. Receiver TX

The camera objective was installed successfully to the Thorlabs VLC photo-receptor. The optical communication channel is functioning. Micro-bolometer sensor (Fig. 6) is provided by NanoFab, Korea within this project. Micro-bolometer is placed in a vacuum and thermic isolated from the exterior medium. The size of the vacuum depends on the structure of the pixels from the thermal image results. The infrared radiation is captured by the absorbing material found over the suspension bridge. At the time of absorption of IR radiation the bridge temperature increases. This increase in temperature is noticed by the electronic components in the ultra-low noise reading circuit under the micro-bolometer [1].

Following the acquisition of thermal images by the micro-bolometer, in order for them to reach a processing unit, the camera can be accessed via its IP address. The partners also designed a graphical interface that allows access to the camera and image processing (Fig. 7). This allows real-time viewing of images from the thermal camera; the viewing method can be set for both black and white images and color images depending on the temperature of the viewed elements [1].

Fig. 6 shows the use of micro-bolometer cameras in an office (in order to prevent fires and detect unauthorized personnel), within the hybrid VLC/IR-RF communications system.

Fig. 6. Micro-bolometer unit

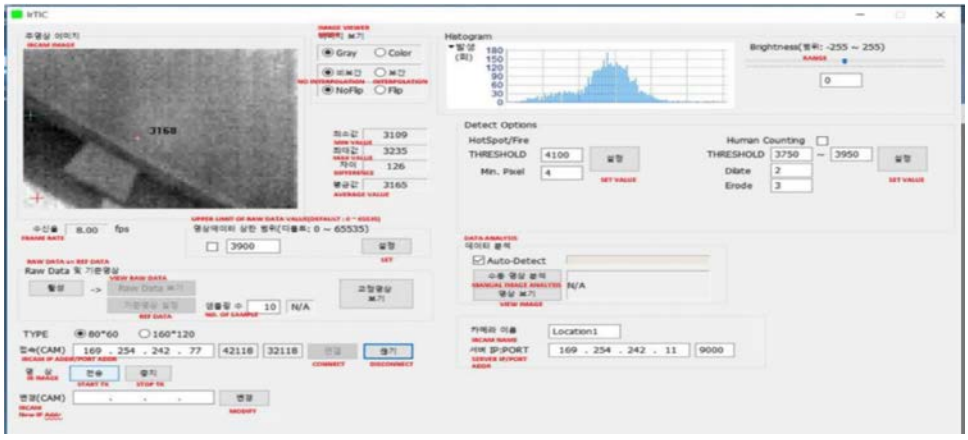

Fig. 7. User Interface

4. The contribution of the hybrid VLC / IR-RF communication system from the point of view of the SmartCity concept

An important aspect worth mentioning below is the contribution that this hybrid VLC/IR-RF communication system can have on the SmartCity concept, if we want to implement it in the near future within the infrastructure specific to outdoor environments, such as road infrastructure (traffic lights, street lighting sources, etc.), but also in the one specific to B2B (Building-to-Building) wireless communication networks (wireless effectively understanding the absence of the data cable-based transmission environment). In order to validate this statement, an additional test of the final system was performed in an outdoor environment, under the direct influence of sunlight, which is for VLC technology one of the largest sources of communication channel disruption. The purpose being to observe the level of performance of the system in circumstances different from those specific to the indoor environment of the research laboratory, was chosen for outdoor testing a day when weather conditions are favorable in terms of BER (Bit Error Rate), which involved the presence of a cloudy character and the absence of precipitation. The results obtained from this test are presented in Fig. 8. The monitoring process was performed within 2 hours, the transmission of the parameters being done once every 10 minutes.

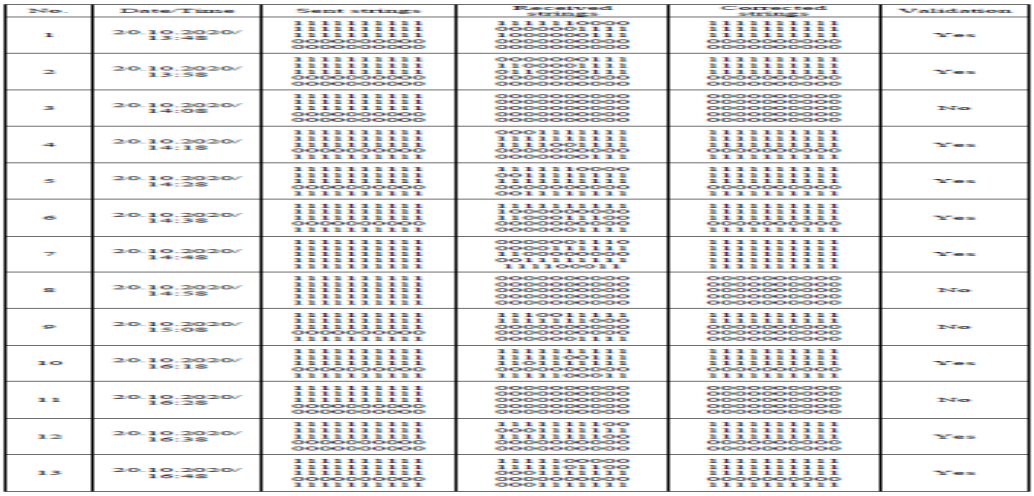

Fig. 8. System monitoring process in outdoor environment

As can be seen, the optical emission source, as well as the reception component, showed an adequate operation of the communication channel, the performance of the system being lower compared to the results obtained indoors. Therefore, this feature demonstrates the potential of this system in terms of improving the existing communication infrastructure at local / national level. By replacing the LED emission source within the VLC transmitter with LED sources with a longer lifespan, the integration into the communication system of optical filters with the role of minimizing the specific disturbance of sunlight, as well as by

using advanced methods of modulation, the hybrid VLC / IR-RF communication system developed by BEIA Consult International, Bucharest, is able to contribute to the modernization trend of Bucharest, from a technological point of view, being able to provide a high level of performance.

Of course, the adoption of such technology at regional / national level will include new challenges in terms of penetration of major industries, the reference being made to the interface with the automotive industry and that of street warning lights (traffic lights, flashing lights, etc.). These technical challenges will be the target of further research, if such an approach proves to be of widespread interest.

6. Conclusion

The emphasis of the paper was on the evaluation of the new system developed by the company BEIA Consult International, from the point of view of the SmartCity concept, with direct reference to the modernization trend of the city of Bucharest. To properly understand this concept, the work was started by analyzing the current state of knowledge about the capabilities that VLC technology has in this regard. Once this approach was completed, the contribution that the final hybrid VLC / IR-RF communications system that had been obtained could have in this direction was presented. To validate this statement, an additional test of the VLC / IR-RF system was performed in an outdoor environment, under the direct influence of sunlight, which is for VLC technology one of the largest sources of communication channel disruption. The results of the outdoor testing were also made available in this activity.

The Hybrid VLC/IR-RF project addresses the active actors on the electronic component development market by developing a device that uses more sensors for smart home and smart grid purposes. It brings increased sensitivity and reduced energy consumption. The device will be capable of multifunctional detection regarding monitoring of energy usage and ambience control in houses, buildings and offices.

Through this project, the technical expertise of Beia Consult International will contribute to the successful development, testing and large-scale implementation of a hybrid VLC-IR / RF communications system specially designed for embedded cameras and devices that require low energy consumption. The aim of the current research activity is to improve current technologies for intelligent control of personal homes and business buildings.

In the future, after the development and testing of the intelligent control system, which will be carried out at the headquarters of Beia Consult International, activities will start to improve the hybrid system so that it will be able in a few years to cope with the establishment of B2B optical communications (Building-to-Building).

The emphasis of the paper was on the evaluation of the new system developed by the company BEIA Consult International, from the point of view of the SmartCity concept, with direct reference to the modernization trend of the city of Bucharest. To properly understand this concept, the work was started by analyzing the current

state of knowledge about the capabilities that VLC technology has in this regard. Once this approach was completed, the contribution that the final hybrid VLC / IR-RF communications system that had been obtained could have in this direction was presented. To validate this statement, an additional test of the VLC / IR-RF system was performed in an outdoor environment, under the direct influence of sunlight, which is for VLC technology one of the largest sources of communication channel disruption. The results of the outdoor testing were also made available in this activity.

Acknowledgements

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Innovative automatic sorting system of the construction and demolition waste materials

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Abstract

Construction and Demolition Waste (CDW) generates nowadays important logistic, provision and environmental issues. Every year 3000 million of Tons are generated in Europe, out of which 25% - 30% is Construction and Demolition Waste (CDW). Construction, renovation, and demolition

projects produce large amounts of CDW that is costly to dispose. Waste processing plants extract useful materials from unsorted waste to reduce recycling costs. However today the problem of automated sorting of CDW is only partially solved, with a large part of the existing activities performed manually and this can be very tricky for dangerous material like asbestos. So far, no sorting system has been developed able to detect the aggregate (containing also pieces of bricks, tiles and glass), which is then often not recovered, or used for applications with very low added value, such as fill material in road construction. The remaining waste is usually converted into refuse derived fuel and burned for energy. This article presents a novel system architecture for sorting Construction and Demolition Waste (CDW) into high-purity, and small-size separated fractions for high-grade applications in the building industry. The method will be a "cutting-edge" technology for a modular robotic system to be easily integrated into customized end-user products. The architecture will be based upon technology for on-fly waste classification and will deliver a necessary technology demonstrator. The first result of the project is to obtain a highly automated and flexible process line for indexing and sorting CDW. Secondly, the system wants to achieve the application of vision sensors and the development of classification algorithms for fast identification and selection of CDW materials. The development of a novel grasping system for rapid CDW material handling and processing also represents a goal for the presented system. The proposed method can overcome environmental issues due to CDW, increasing the overall recycled material and maximize the technical and economic value of recycled materials and products.

Keywords: *robotic arm, classification algorithms, recycling system.*

1. Introduction

Construction and Demolition Waste (CDW) is defined as the solid components of waste streams arising from the construction, demolition, or refurbishment of buildings or infrastructures, but does not contain Municipal Solid Waste, General Commercial, and Industrial Waste, Listed Waste, Hazardous Waste or Radioactive Waste [1]. This definition is slightly different from country to country. The ability to recycle and reuse CDW is essential to reduce environmental impacts in meeting global, national, and regional environment protection targets.

CDW represents various recyclable materials, such as metals, plastics, wood, gypsum, mineral wool, cardboard and paper, and concrete. CDW is generally considered to be harmless for the environment, and thus landfill has been commonly used. Nowadays, regarding the identification of environmental hazards and detection of the value of recycling, research is focusing on the recycling and reuse of materials. Studies have shown that approximately 90% of CDW can be recycled, which reduces the need for landfill sites [2]. The Waste Framework Directive demands the Member States take any needed measures to reach by 2020 a minimum barrier of 70 % by weight of non-hazardous CDW for reuse, recycling, and another recovery of the material backfilling operations (refilling of an excavated area [3].

CDW will be more complex than the existing one, and there is a need for shifting from traditional recycling approaches to novel recycling solutions. A basic step to achieve this objective is a relevant improvement in (automatic) sorting technology using innovative technologies that will increase the percentage of recycled materials and reused structures from CDW. The technical and economic value regarding CDW-derived materials and structures, and the building energy efficiency while minimizing future CDW expected from the next generation of buildings [4].

The rest of the paper is organized as follows: Section 2 of the paper describes the current technology used in recycling for the CDW materials; Section 3 offers information about the innovative automatic sorting system, whilst Section 4 concludes it.

2. Recycling of CDW materials in building application

The main objective of today's society is the conservation of the environment and natural recourses. Current regulations foster the use of recycled aggregates reducing the generation of waste without control and massive use of natural raw materials. Recent estimations indicate that the EU28 has consumed between 1.200 - 1.800 Million tonnes of construction materials per annum for new buildings and refurbishment between 2003 and 2011. Cement, aggregate materials, and bricks are estimated to make up to 90% (by weight) of all materials used [5].

The ongoing technology for recovering aggregate from CDW is based on washing, crushing, and screening processes, typically coupled with a thickener unit and filter press for water recycling. While floating materials and fine fractions are discarded, clean and sorted aggregate sizes are obtained. However, no sorting based on different mineral materials is made, and this influences the quality of the aggregate in terms of physic, chemical, and mechanical properties [6].

One of the goals of the RECICLARM project is to develop a novel system capable of automated indexing and sorting of CDW materials. The proposed system will overtake the limitations of current sorting technologies, developing a highly automated processing line, guaranteeing high throughput and extreme flexibility. Can handle small fragments of CDW (<5 cm), maximizing the percentage of recycled CDW from <50% up to >90%, also optimizing the quality of each fraction/material for high-value applications. Thus, the main RECICLARM results consist of:

1. Highly automated and flexible process line for indexing and sorting CDW;
2. Application of vision sensors and development of classification algorithms for fast identification and selection of CDW materials;
3. Development of a novel grasping system for rapid CDW material handling and processing.

3. Innovative automatic sorting system

One of the RECICLARM project's objectives is developing a fully automatic robot-based system to sort CDW by material classes to allow the recycling of CDW in

high technical and economic value applications in the building industry from a circular economy perspective. The system will separate stones and aggregates bricks, ceramics, glass, plastic, and wood. Then will further recycle sorted material according to the particle size requirements for target applications. The sorting system comprises three elements: a sensing technology, a real-time classification algorithm, and a robotic arm with an end-effector.

Sensing technology: the sensor system aims to detect each CDW particle's surface features moving on a conveyor belt. The system's concept design previews wide spectrum hyperspectral cameras rare based on the X-Ray sensors, NearInfra Red(NIR), and visible sensors. The sensing technology's core innovation is based on the 3D/RGB multispectral cameras and IR sensors, the real-time classification, control strategy coordinating the sensing technology, and the automated cell. The advanced grasping technology manipulates small fragments of CDW. To identify different materials and maximize the quality of sorted materials is used real-time trainable classification algorithm running on a CPU. For that will use a set of sensors:

- A 3D camera or a system composed of RGB cameras will detect the color, shape, position, orientation, and the center point of each object
- Infra-Red (IR) spectral sensors will analyze the molecular structure of the object surface; this will give important information about the material composing the object
- Laser-Induced Breakdown Spectroscopy (LIBS) and Terahertz technology will be studied as possible inspection techniques to be implemented, in conjunction or alternative to IR. It will be investigated to include contact sensing technologies (in particular transducers for impedance spectrum, sound transmission spectrum) to refine or correct the classification results.

All the information collected by the sensors will feed a computer-based classifier for the sorting of the objects.

Classification Algorithm: both spectral and geometric information will be acknowledged by a real-time classification algorithm, whose development environment and hardware are under analysis. Conceptually, the center of gravity of a single CDW part will be identified and detected as the point of the working domain on which the robot end-effector has to pick the target. On the other side, the NIR and reflectance data acquired from the same particle will be fused and elaborated by the algorithm to generate a 2D heat map of the objects on the conveyor belt at a certain time. Regarding the speed of the belt and the information of the heat map, the algorithm will calculate the Cartesian coordinates of the object when the robot picks it and will assign the material class to the object itself.

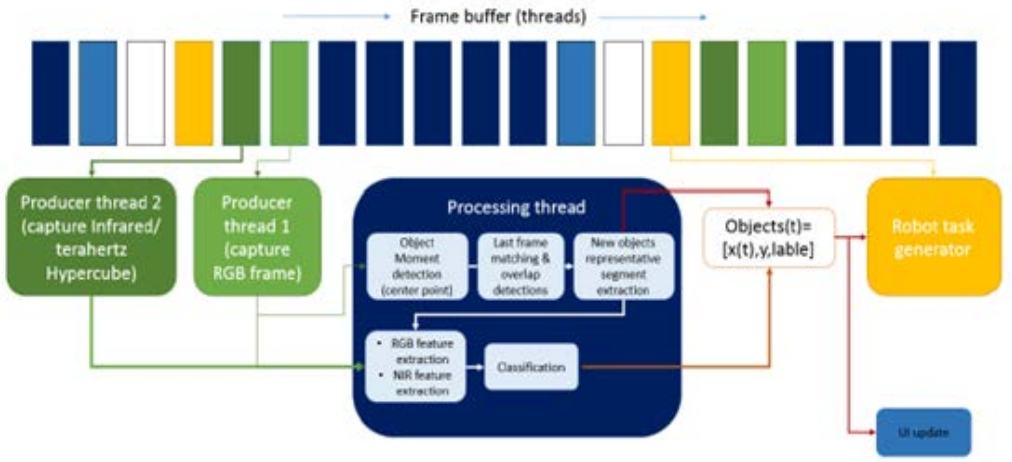

Fig. 1.Sensing software architecture for data fusion and control

Innovative Mechatronic architecture: It is expected that the RECICLARM system will be fed with input waste material in the form of particles, after crushing, on a conveyor belt. According to the classification algorithm's material class, the 6 Degrees of Freedom robotic arm will be used to handle each object and move it to the final position.

Will be developed an advanced grasping to equip the robot for pick and place. The gripper is a crucial part of the project because it strongly affects the type of fractions that can be processed. On one hand, systems such as"Universal jamming gripper" or "FESTO Flexshape gripper" allow the control system to reduce the massive amount of data computed. One robot configuration always complies with the gripper's needs. On the other hand, these flexible grippers may cube damaged by sharp objects, or the particles may not have the required shape to be suitably gripped. The system will handle small objects (<5 cm), which current smart systems cannot, which represent a large fraction of the total CDW. The robotic system will then handle each particle/object, physically separating objects made by different materials. The system's structure follows the control system's trajectories based on the objects' information (position, center point, orientation, shape, material).

Control system: The real-time classification system exploiting 3D/RGB cameras and hyperspectral sensors will provide input to the control system. The robot trajectories will be optimized to directly take the object from the conveyor belt and reach the right container (in the grasping case) in a short cycle time. The final aim is to maximize the system productivity (i.e., the amount of sorted material per time unit) by keeping the error rate as low as possible. Based on the identified objects and their materials, the system will optimize a picking sequence, maximizing the recovered objects' monetary value, thanks to dedicated algorithms.

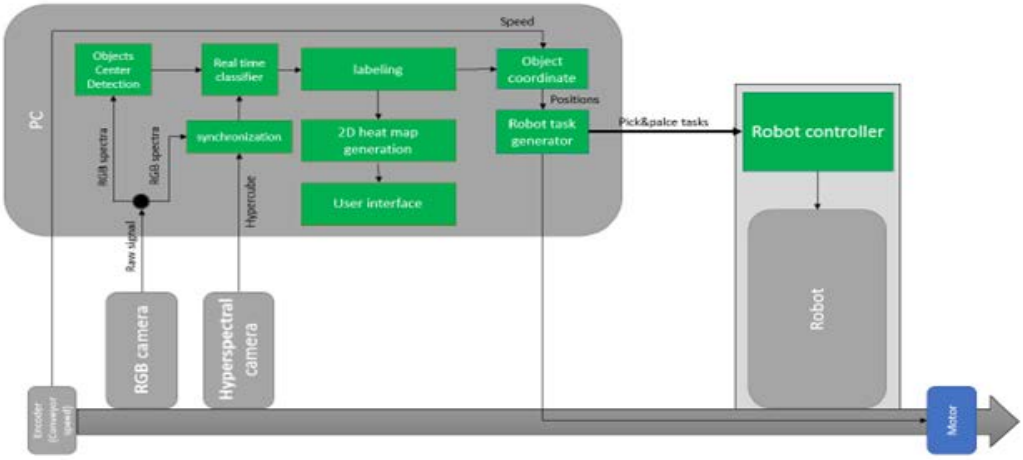

Fig. 2.RECICLARM control system layout

4. Conclusions

The main goal of the RECICLARM project is to develop a fully automatic,robot-based sorting system that will achieve a complete separation of the coarse fractions of CDW materials and obtain sorted classes of aggregates bricks, ceramics, glass, plastics, and wood. Hyperspectral analysis of each particle of crushed CDW will allow us to recognize the nature of different materials. Then will be develop a classifier to drive the robot in physical sorting. The technology will enable new kinds of possibilities for the waste industry. First, with increased automation, companies will easily increase waste sorting efficiency, resulting in a lower cost per produced ton of end fractions. Secondly, with new and improved recognition capabilities, recycling companies will have the opportunity to sort new kinds of waste types of high quality. In the future, using new knowledge can be transferred to other industry sectors, such as the recognition of different materials. As a result, this method can be generalized for the sorting of solid urban waste. Some high-value applications could be experimented with, like automatic separation of valuable materials from disposing of electronic devices. Finally, with advanced grasping technology, waste companies will be able to sort out more materials with fewer machines.

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Adaptarea politicilor fiscal la pandemia Covid 19 Crearea unui sistem fiscal adaptat la lumea digitală

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Abstract

În actualul context generat de Pandemia Covid 19, statele membre au nevoie de venituri fiscale sigure pentru a investi în oamenii şi întreprinderile afectate de criza sanitară. În acelaşi timp, trebuie eliminate obstacolele fiscale şi stimulate întreprinderile din UE să inoveze, să investească şi să se dezvolte. Având în vedere cele de mai sus, în iulie 2020, CE a adoptat Planul de acţiune, ce cuprine măsuri în vederea reducerii sarcinii administrative, a îmbunătăţirii gradului de conformare fiscală şi combaterii evaziunii fiscale. Plan de acţiune care vizează crearea unui sistem de impozitare mai echitabil, mai uşor de utilizat şi mai adaptat la lumea noastră digitală. În cadrul articolului au fost utilizate instrumente specifice precum: clasificarea, sinteza, analiza comparativă, metodele inducţiei şi deducţiei, reprezentarea grafică a evenimentelor şi fenomenelor investigate. Articolul se adresează deopotrivă mediului universitar, celui academic, cât mai ales reprezentanţilor administraţiei fiscale şi factorilor cu putere de decizie în corectarea inegalităţilor create de Pandemia Covid 19.

Cuvinte cheie: *facilităţile fiscale, lumea digitală, reducerea sarcinii administrative, sistem de impozitare*

1. Introducere

Pandemia COVID-19 a dus la scăderea tuturor economiilor ţărilor la nivel mondial şi, implicit, a economiei globale. În actualul context generat de Pandemia Covid 19, statele membre au nevoie de venituri fiscale sigure pentru a investi în oamenii şi întreprinderile afectate de criza sanitară.

Istoria a evidenţiat o creştere a taxelor după crizele economice înregistrate de-a lungul timpului, ceea ce nu este de dorit, cu atât mai mult cu cât luarea unor măsuri de austeritate prea curând ar împiedica o posibilă redresare economică.

Nevoia de venituri bugetare este tot mai mare. Atât contribuabilii, cât şi guvernele vor dori în viitor stabilitate şi vor pune accent pe sustenabilitatea anumitor tipuri de venituri fiscale care, pe fondul unor crize şi tensiuni să aibe capacitatea financiară de a susţine economia.

Urmare a crizei sanitare, lanţurile de aprovizionare concentrate la nivel global şi procesele foarte dependente de oameni sunt reanalizate în acest moment. Automatizarea şi robotizarea vor înlocui tot mai mult forţa de muncă, cu efecte asupra impozitelor privind forţa de muncă.

În prezent majoritatea guvernelor au elaborat programe/planuri de salvgardare economică pe termen mediu şi lung care includ măsuri de adaptare a politicilor fiscale bazate pe:

- simplificarea regulilor pentru a facilita conformarea şi administrarea;
- eficientizarea modului în care sistemul asigură o distribuire corectă a poverii fiscale;
- eliminarea din sistemul fiscal a distorsiunilor şi a lacunelor.

Este mai important ca oricând ca statele membre să aibă venituri fiscale sigure, astfel încât să poată stimula întreprinderile să inoveze, să investească şi să se dezvolte.

2. Pachetul de măsuri apt pentru a contribui la redresarea şi creşterea economiei Europei

Având în vedere cele de mai sus, pe 15 iulie 2020, Comisia Europeană a adoptat Planul de acţiune [5], un nou pachet fiscal ambiţios ce cuprine măsuri în vederea reducerii poverii administrative, a îmbunătăţirii gradului de conformare fiscală şi combaterii evaziunii fiscale. Planul de acţiune este construit pe doi piloni: cel al corectitudinii şi cel al simplicităţii şi are ca principal scop crearea unui sistem de impozitare mai echitabil, mai uşor de utilizat şi mai adaptat la lumea noastră digitală.

Planul de acţiune cuprinde cuprinde trei iniţiative separate:

a) Planul de acţiune pentru o impozitare corectă şi simplă care să sprijine veniturile din recuperare

Planul de acţiune fiscală - conţine 25 de măsuri distincte. Aceste acţiuni vor sprijini contribuabili cinstiţi, eliminând obstacolele la fiecare pas, de la înregistrare la raportare, plată, verificare şi soluţionarea litigiilor. Statele membre trebuie să pună în aplicare aceste iniţiative între 2020 şi 2024 pentru a face impozitarea mai echitabilă, mai simplă şi mai adaptată la tehnologiile moderne.

Planul de acţiune fiscală stabileşte măsuri pentru:

- reducerea poverii fiscale prin eliminarea sarcinilor administrative inutile pentru întreprinderile care operează pe piaţa unică. Simplificarea impozitelor va îmbunătăţi mediul de afaceri, va spori competitivitatea afacerilor şi va contribui la creşterea economică;

- imbunătățirea conformării fiscale, prin aplicarea unor norme legislative flexibile, capabile a asigura venituri bugetare stabile;
- combaterea fraudei şi evaziunii fiscale prin aplicarea unor reguli clare şi a sporirii schimbului de informaţii între statele membre;
- promovarea drepturilor contribuabililor, prin creşterea gradului de conştientizare a drepturilor lor în temeiul legislaţiei UE, simplificarea obligaţiilor lor şi facilitarea respectării acestora.

b) Revizuirea Directivei privind cooperarea administrativă (DAC7)

Comisia a propus modificarea Directivei privind cooperarea administrativă, pentru a extinde normele UE privind transparenţa fiscală la platformele digitale, cee ce va asigura schimbul automat de informaţii între statele membre cu privire la veniturile generate de vânzătorii de pe platformele digitale. Acest lucru va permite autorităţilor naţionale să identifice situaţiile în care ar trebui să plătească impozite şi va reduce, de asemenea, povara administrativă.

c) Comunicare privind buna guvernanţă fiscală în UE şi nu numai

Comunicarea privind buna guvernare fiscală se concentrează pe promovarea unei impozitări corecte şi pe limitarea concurenţei fiscale neloiale în UE. Astfel, Comisia sugerează o reformă a Codului de conduită, care abordează concurenţa fiscală şi abordează practicile fiscale dăunătoare din UE. De asemenea, propune îmbunătăţirea listei privind jurisdicţiile necooperante din afara UE care refuză să respecte standardele convenite la nivel internaţional. Codul de conduită subliniază, de asemenea, abordarea UE de a colabora cu ţările în curs de dezvoltare în domeniul impozitării, în conformitate cu agenda de dezvoltare durabilă 2030.

3. Facilităţi fiscale acordate pentru a contribui la redresarea economiei în România

Având în vedere diminuarea volumului activităţii, în aproximativ toate domeniile (excepţie sectorul construcţii, cel al comerţului online şi implicit al livrărilor la domiciliu), ca urmare a crizei sanitare declanşată în România la sfârşitul lunii februarie, Agenţia Naţională de Administrare Fiscală a luat o serie de măsuri în vederea susţinerii activităţii agenţilor economici care-şi desfăşoară activitatea pe teritoriul României:

- au fost adoptate măsuri legislative în vederea diminuării efectelor economice resimţite de încetinirea activităţii economice la nivel naţional şi internaţional. Astfel, în temeiul Ordonanţelor de urgenţă a Guvernului nr. 29 [2] şi 181 adoptate în 2020, nu se calculează şi nu se datorează dobânzi şi penalităţi de întârziere, pentru obligaţiile fiscale scadente şi neachitate începând cu data intrării în vigoare a prevederilor OUG nr. 29/2020 (martie 2020) şi până la încetarea acestor măsuri (25 decembrie 2020, inclusiv), conform OUG nr. 181/2020). În toată această perioadă, contribuabilii au posibilitatea de a amâna momentul plăţii obligaţiilor bugetare, fără consecinţe fiscale;
- au fost adoptate măsuri legislative care au sprijinit menţinerea conformării voluntare la plată, cum a fost spre exemplu acordarea bonificaţiilor pentru

contribuabilii care şi-au plătit diverse categorii de impozit: impozitul pe profit, impozitul pe veniturile microîntreprinderilor aferente trimestrului I al anului 2020, până la termenul scadent de 25 aprilie 2020 inclusiv, caz în care bonificaţia a fost de 5% pentru contribuabilii mari şi 10% pentru celelalte categorii de contribuabili;

- prin Ordonanţa de urgenţă a Guvernului nr. 48/2020 [3] au fost aprobate o serie de măsuri fiscale pentru contribuabilii care aveau în derulare înlesniri la plată, având în vedere faptul că aceştia se aflau deja în dificultate financiară la momentul acordării înlesnirilor, iar starea de urgenţă le-a îngreunat desfăşurarea activităţii;
- prin Ordonanţa de urgenţă a Guvernului nr.181/2020 [4] au fost aprobate o serie de măsuri fiscale:
- eşalonarea la plată pe o perioadă de cel mult 12 luni pentru obligaţiile fiscale principale şi accesorii a căror scadenţă/termen de plată s-a împlinit după data declarării stării de urgenţă şi nestinse până la data eliberării certificatului de atestare fiscală;
- contribuabilii obligaţi la plata impozitului specific unor activităţi, potrivit Legii nr.170/2016 „*privind impozitul specific unor activităţi*" (din domeniile: hoteluri şi alte facilităţi de cazare similare, restaurant, activităţi de alimentaţie), nu datorează impozit specific pentru perioada octombrie - 31 decembrie 2020.

De asemenea în cursul lunii iulie 2020, a fost aprobat „*Planul operaţional de recuperare a veniturilor al Agenţiei Naţionale de Administrare Fiscală*" [6], care cuprinde trei măsuri distincte:

a) Măsuri de salvgardare a veniturilor, dintre acestea amintim:

- asigurarea posibilităţii de înregistrare fiscală (inclusiv a modificărilor ulterioare) prin mijloace electronice, a tuturor categoriilor de contribuabili;
- analiza şi identificarea domeniilor de activitate ce înregistrează descreşteri, stagnări sau creşteri ale activităţii;
- identificarea primilor mari plătitori (Top 100);
- identificarea primilor mari debitori (Top 100), la data efectuării analizei;
- actualizarea managementului arieratelor, în vederea creşterii gradului de conformare voluntară la plată şi de colectare a creanţelor bugetare;
- efectuarea analizei de risc pentru contribuabilii care prezintă risc pentru administraţia fiscal.

b) Asigurarea disponibilităţii serviciilor pentru contribuabili, acţiuni:

- dezvoltarea serviciilor electronice oferite contribuabililor, de exemplu: crearea posibilităţii depunerii on-line a tuturor declaraţiilor/cererilor pentru persoane fizice şi juridice; dezvoltarea funcţionalităţilor SPV (Spaţiu privat virtual) pentru persoane fizice; punerea în funcţiune a aplicaţiei privind programarea on-line;
- organizarea de sesiuni de asistenţă pe pagina de Facebook a Agenţiei;
- organizarea de campanii de mediatizare, constientizare, de exemplu: publicarea de materiale informative, pe site-ul instituţiei, cu privire la

serviciile dezvoltate şi funcţionalităţile acestora, inclusiv instrucţiuni de utilizare; transmiterea de informări periodice contribuabililor, cu privire la avantajele utilizării serviciilor online (prin publicarea de texte „rulante" în SPV);

- identificarea de noi servicii ce pot fi oferite prin intermediul Call-center-ului (aplicaţie pentru mobil);
- analizarea modului în care se va acorda asistenţă digitalizată de tip Chatbot, prin Call-center.

c) Măsuri pentru susţinerea proceselor de business, vizează continuitatea derulării activităţilor curente ale Agenţiei cu asigurarea condiţiilor de securitate şi sănătate pentru personal şi a contribuabili.

Sunt avute în vedere acţiuni menite a optimza activitatea ANAF, (inclusiv adaptarea la situaţia de criză sanitară traversată în această perioadă), spre exemplu:

- analizarea măsurilor întreprinse în perioada stării de urgenţă şi implementarea în activitatea curentă a lecţiilor de bună practică;
- identificarea activităţilor ANAF mari consumatoare de resurse şi propunerea optimizării acestora.

În prezent ANAF elaborează noua strategie pe termen mediu, obiectivul principal fiind *dezvoltarea unui parteneriat între ANAF şi contribuabili.* Parteneriat în cadrul căruia ANAF îşi propune să oferire contribuabililor servicii de calitate şi să scadă povera administrative prin elaborarea unor proceduri simplificate şi prietenoase, astfel încât aceştia din urmă să înţeleagă sarcinile fiscale pe care le au, să conştientizeze importanţa declarării corecte şi realizarea plăţii impozitelor şi taxelor datorate bugetului de stat în termenul legal.

4. Analiza gradului de colectare a veniturlilor la bugetul statului în perioada ianuarie–octombrie 2020 versus ianuarie–octombrie 2020

Analiza economică a efectelor provocate de criza sanitară, arată că la finalul celui de-al doilea trimestru al anului 2020, comparativ cu aceeaşi perioadă a anului 2019 [1], în România:

- produsul intern brut a scăzut, în termeni reali, cu 10,5%;
- volumul cifrei de afaceri pentru serviciile de piaţă prestate populaţiei s-a diminuat cu 68,0%;
- volumul producţiei industriale s-a redus cu 26,8% şi implicit, cifra de afaceri din industrie a scăzut cu 27,2%;
- volumul cifrei de afaceri pentru comerţul cu amănuntul, cu excepţia autovehiculelor şi a motocicletelor, a scăzut cu 7,3%;
- exporturile au scăzut cu 33,6%, iar importurile au scăzut cu 26,4%;
- valoarea schimburilor intracomunitare de bunuri a fost cu 33,0% mai mica la exporturi şi cu 27,2% mai mică la importuri.

Toate aceste comprimări ale activităţii economice, coroborate cu măsurile fiscale luate de guvern în vederea sprijinirii agenţilor economici au avut o influenţă directă asupra gradului de conformare la plată a contribuabililor şi implicit asupra

veniturilor colectate la buget. Situaţia lunară a încasărilor la bugetul consolidat în perioada ianuarie–octombrie 2020, comparativ cu perioada similară din 2019 este prezentată în tabelul următor:

Tabel 1. Încasări la bugetul consolidat în perioada ianuarie–octombrie 2020, comparative cu ianuarie–octombrie 2019

	2019			2020		
	Sume încasate în termen, aferente sumelor declarate (lei)	**Sume declarate (de plată) (lei)**	**Grad realiza-re %**	**Sume încasate în termen, aferente sumelor declarate (lei)**	**Sume declarate (de plată) (lei)**	**Grad realizare %**
ianuarie	21.250.953.769	25.035.452.700	84,88	23.652.626.871	27.367.798.791	86,43
februarie	15,617,393,403	18,255,949,127	85.55	17,921,961,751	20,500,716,660	87.42
martie	19.552.970.618	22.629.519.479	86,40	16.529.027.238	24.705.467.581	66,90
aprilie	21.656.904.903	25.229.189.945	85,84	20.152.899.275	26.865.469.498	75,01
mai	18.347.568.336	20.983.540.403	87,44	13.649.734.525	18.202.277.406	74,99
iunie	17.926.293.463	20.778.327.513	86,27	15.795.939.674	19.741.149.384	80,02
iulie	24.446.027.922	27.999.748.607	87,31	21.637.272.998	26.935.693.533	80,33
august	19.259.491.580	21.999.503.273	87,55	17.967.781.429	22.757.413.392	78,95
septembrie	18.701.225.079	21.551.303.476	86,78	16.728.061.145	22.015.093.957	75,98
octombrie	23.988.909.359	27.646.639.104	86,77	23.130.893.046	28.465.861.092	81,26

Sursa: *prelucrare proprie pe baza datelor furnizate de: https://www.anaf.ro/*

Analizând graficul privind gradul de conformare la plată în perioada ianuarie – octombrie 2020, comparativ cu aceeaşi perioadă a anului anterior, se observă că doar în lunile ianuarie şi februarie s-a înregistrat un grad de conformare la plată mai mare comarativ cu nivelurile înregistrate în ianuarie şi februarie 2019. În rest pentru toată perioada analizată indicatorul a înregistrat valori sub cele ale perioadelor similare anului anterior. Totodată, se observă că cel mai mic grad de conformare la plată a fost înregistrat în martie 2020, când doar 66,90% din sumele declarate de către contribuabili au fost plătite. Acest fapt este explicabil întrucât, pe 14 martie România a intrat în al treilea scenariu COVID-19, iar la 16 martie preşedintele ţării a emis decretul de stabilire a stării de urgenţă, ceea ce a condus la diminuarea masivă a volumului anumitor activităţi economice, iar pentru altele chiar blocarea definitivă.

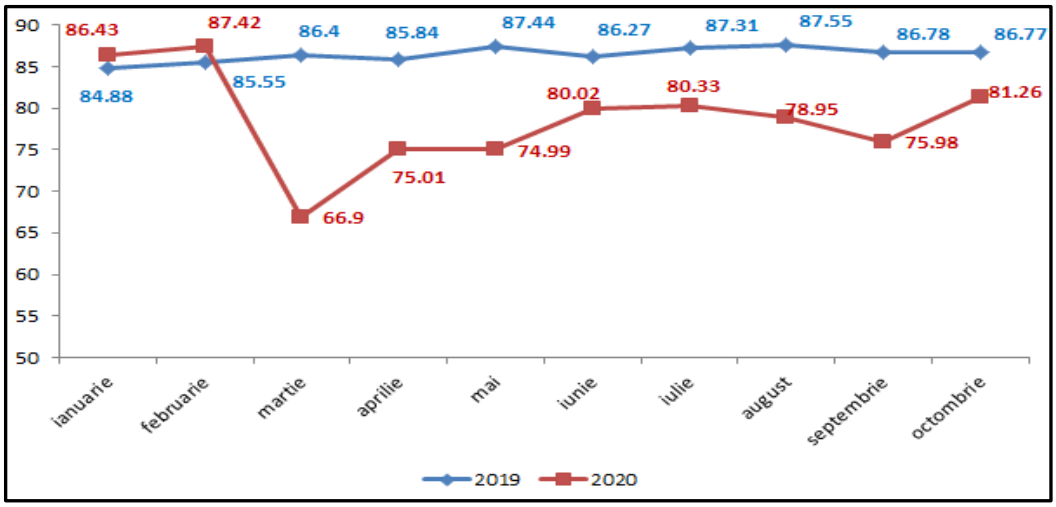

Fig.1. Gradul de conformare la plată
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În ceea ce privește sumele colectate la buget, de asemenea, doar în ianuarie și februarie 2020 acestea au fost mai mari decât în 2019. În rest nivelul de încasare a fost mai mic. Cel mai mare decalaj a fost înregistrat în luna mai, cînd s-a încasat cu 4.697.833.811 lei mai puțin față de sumele încasate în mai 2019.

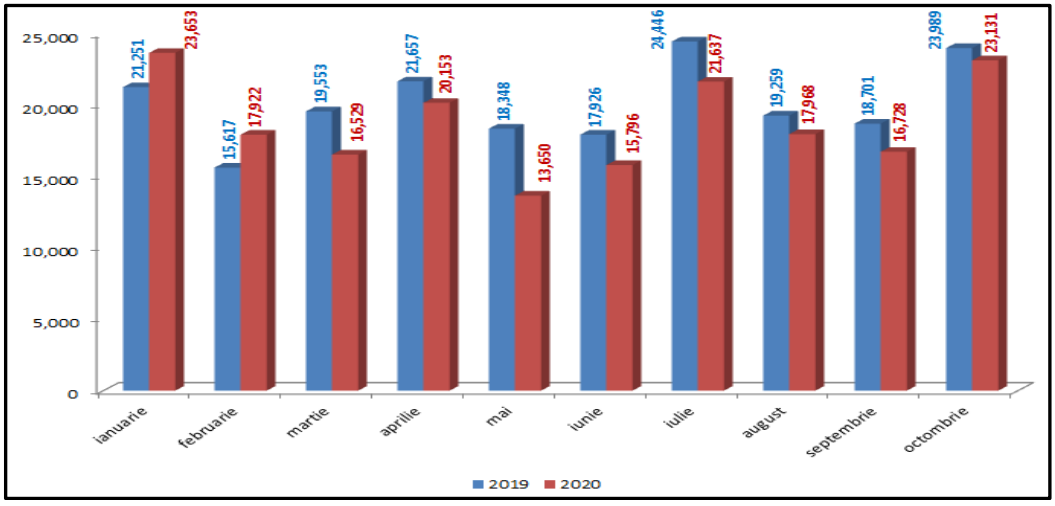

Fig.2. Total sume încasate în termen
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Pe totalul perioadei analizate încasările la buget au scăzut cu 13.581.540.480 lei, față de perioada ianuarie-octombrie 2019, iar gradul de conformare la plata obligațiilor fiscale în primele 10 luni ale anului 2020 comparativ cu perioada similară a anului 2019 a înregistrat o scădere de 7,70 puncte procentule.

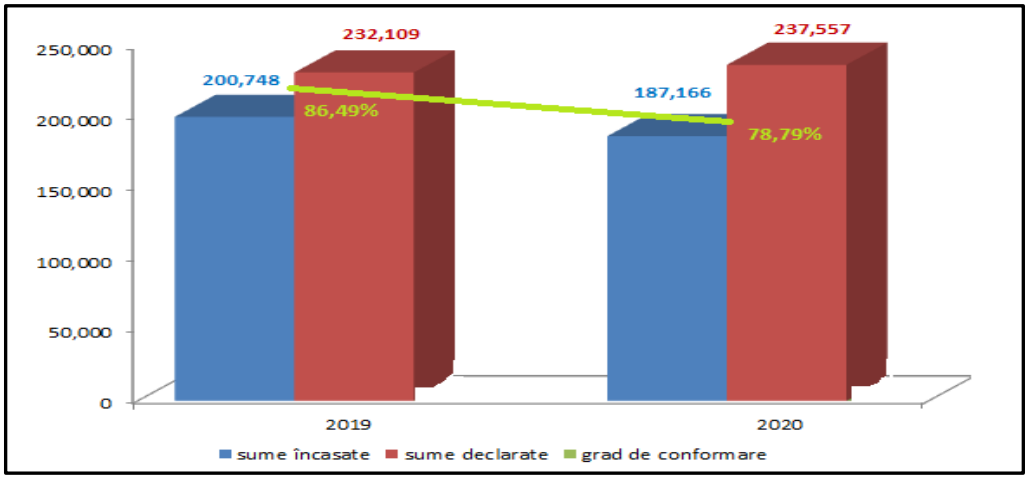

Fig. 3. Total sume încasate în termen, cumulat în primele 10 luni ale anului 2020, comparativ cu aceeaşi perioadă din 2019
Sursa: *prelucrare proprie pe baza datelor furnizate de: https://www.anaf.ro/*

5. Concluzii

Fie că s-au concretizat în amânări, scutiri la plată sau alte înlesniri, facilităţile fiscale reprezintă o componentă decisivă a planurilor de sprijin economic pe care guvernele din toată lumea le-au aplicat în faza iniţială de apariţie a pandemiei, dar şi în a doua etapă de repornire a activităţii. Toate statele europene şi-au ajustat politicile fiscale pentru a răspunde rapid condiţiilor economice atipice ale acestei perioade.

Chiar dacă, în această perioadă, nu au fost făcute modificări pe fond, criza pandemică, a accelerat procesul de adaptare a sistemului fiscal românesc la transformările aduse de tehnologie şi digitalizare. În perioada următoare trebuie continuate eforturile de reformare a administraţiei fiscale şi de informatizare.

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Liderii politicii trebuie să devină smart

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Abstract

În 2020, totul s-a schimbat. Practic, ne-am trezit cu toţii într-o nouă realitate. Dar, întrebarea este: liderii noştri s-au schimbat?
Pe măsură ce tehnologia evoluează atât de rapid şi furios, este esenţial ca liderii politici să evolueze şi ei.
Scopul acestei lucrări este acela de a prezenta caracteristicile pe care trebuie să le posede un lider politic smart într-o lume care a devenit deja mult prea smart pentru mulţi dintre noi.
Dacă vrem, nu doar să supravieţuim, ci şi să prosperăm în anii care urmează, atunci liderii politici trebuie să ţină cont de câteva aspecte esenţiale.
Lucrarea de faţă are la bază cercetarea efectuată în contextul politicii româneşti, unde leadershipul este exercitat preponderent prin forţă, nu prin viziune şi inspiraţie.
Concluziile acestui articol sunt relevante pentru oamenii politici care vor să înţeleagă cum trebuie condusă România când întreaga lume stă sub semnul schimbării.

Cuvinte cheie: *leadership, smart people, guvernare, inteligenţă artificială.*

1. Introducere

Anul 2020 este marcat de pecetea pandemiei de coronavirus care a pus stăpânire peste întreaga planetă şi pe care liderii statelor lumii sunt chemaţi să o gestioneze în cel mai eficient mod cu putinţă.

Ameninţările şi provocările fără precedent cu care se confruntă majoritatea ţărilor ne situează într-un moment istoric fragil şi care, cel mai probabil, se va transpune în cea mai mare criză din toate timpurile: criza de leadership!

În acest sens, trebuie remarcat faptul că suntem în pragul unei „ierni sociale", caracterizată printr-o distanţare tot mai mare în ceea ce priveşte interacţiunea umană, dar tot mai dependentă de tehnologie.

Iar pe fondul evoluţiei rapide şi furioase a tehnologiei, România va trebui să îşi adune toate forţele şi să facă un salt cuantic în tot ceea ce priveşte politica viitorului.

Astfel, liderilor politici români le revine misiunea de a-şi concentra eforturile pentru a insufla o nouă viziune naţională, bazându-se atât pe noile trenduri tehnologice, cât şi pe păstrarea şi respectarea drepturilor şi libertăţilor individuale, dar şi a valorilor şi credinţelor naţionale.

2. Criza de leadership

Dacă e să facem o evaluare obiectivă a stării de fapt în care se află azi România – sărăcie, corupţie, fraude, poluare excesivă, supra birocratizare, lipsa digitalizării, rateurile în gestionarea pandemiei de coronavirus, mizeria sexuală care destabilizează şi dezagregă familia şi aruncă omul în disperare şi decădere – constatăm că, de fapt, suntem într-o criză acută de moralitate.

Iar „lipsa de igienă morală a indivizilor are drept consecinţă, pe lângă instabilitatea familială, chiar şi instabilitatea socială. Dacă nu există o bază morală solidă, se poate ajunge până la tulburări politice grave.” [1]

2.1. Leadership uman versus leadership artificial

Dacă acum ceva vreme, arcul cu săgeată era considerat a fi vârful tehnologiei şi făcea diferenţa pe câmpurile de luptă, azi trăim într-o realitate distinctă, în care tehnologiile smart şi inteligenţa artificială par să preia controlul umanităţii.

Cu toate că s-au scris numeroase cărţi despre leadership, iar istoria abundă în exemple de personalităţi politice marcante care au reuşit să influenţeze în mod pozitiv cursul acesteia, totuşi, azi, nu putem să nu ne adresăm următoarea întrebare: Ce se va alege de umanitate în următoarele decenii? Şi, mai ales, vor fi liderii politici actuali capabili să ne conducă spre un viitor luminos sau vom rătăci printre tenebrele unei lumi artificiale?

Nu mai este niciun secret faptul că tehnologia are capacitatea de a ne influenţa comportamentul şi chiar de a ne schimba radical deciziile, ba chiar de a prezice cu cine vom vota sau de cine ne vom îndrăgosti, fără ca măcar să fim conştienţi de acest lucru.

Mai mult decât atât, anul 2020 este anul oficierii relaţiei dintre om şi chatbot. Cu toate că această relaţie exista deja de ceva vreme, odată cu decretarea stării de urgenţă pe teritoriul României, relaţia cu roboţii a devenit mult mai valoroasă decât cea cu vecinii sau colegii de muncă aflaţi în izolare.

Oricât de hilară ar părea această situaţie, în realitate ea ne dezvăluie faptul că am început să ne cedăm suveranitatea propriei conştiinţe în favoarea unei inteligenţe artificiale, total lipsite de emoţie.

Însă, problemele care vizează securitatea naţională, dificultăţile economice sau zbaterile sociale nu vor putea fi rezolvate cu ajutorul unor algoritmi care facilitează transmiterea mesajelor de către politicieni pe reţelele de socializare.

De aceea, tragem un semnal puternic de alarmă cu privire la atribuirea rolului de lider politic, care nu mai poate fi făcută ca rod al unei simple conjuncturi favorabile sau ca urmare a înţelegerilor intervenite la masa negocierilor din cadrul partidelor politice, ci ea trebuie să îndeplinească anumite criterii.

3. Trăsăturile esenţiale pe care trebuie să le posede liderul politic al viitorului

Arta conducerii nu este despre obţinerea unei poziţii sau funcţii politice, fie ea chiar şi cea mai înaltă funcţie din stat.

Conducerea unei naţiuni nu înseamnă doar să fii liderul acelei naţiuni, ci să conduci oamenii acelei naţiuni din locul în care se află într-un loc mai bun.

Iar pentru asta, liderul politic al viitorului trebuie să întrunească mai multe caracteristici. Nu pretindem că acestea ar fi exhaustive, dar ele sunt esenţiale pentru a putea conduce România spre culmi, şi nu spre declin.

3.1. Să aibă viziune

Cea mai importantă abilitate a unui lider politic este viziunea.

Desigur, sunt mulţi oameni politici care cred că au o viziune naţională, dar, în realitate, ei au doar o versiune despre ceea ce cred că ar putea fi România şi care s-a dovedit a fi destul de îngustă în ultimii 30 de ani.

Viziunea este scânteia care se aprinde în interiorul unui om şi îl înflăcărează permanent să urmeze un anumit drum. Nu este ceva care se creează din exterior. Altfel, nu mai poate fi vorba de viziune, ci de un obiectiv.

Dar, ceea ce îl poate face pe un om politic să devină un lider politic este abilitatea lui de a da viaţă acelei viziuni. Cu alte cuvinte, el trebuie să posede acel *phronesis* sau acea înţelepciune practică de care amintea Aristotel şi care reprezintă capacitatea de a delibera între ceea ce se poate realiza împreună cu abilităţile necesare de a realiza acel lucru. Desigur, nimeni nu urmează doar o viziune. Viziunea fără un lider care să inspire şi să motiveze oamenii e doar o nălucă.

De aceea, viziunea trebuie să provină din inima liderului şi să fie comunicată fiecărei persone implicate în acea mişcare.

3.2. Să inspire încredere

"Încrederea se află la baza ştiinţei conducerii", iar „caracterul este singura armă eficientă împotriva forţelor interne şi externe care duc la dezintegrarea sau colapsul unei naţiuni." [2]

În ceea ce priveşte gradul de încredere pe care cetăţenii îl acordă liderilor politici, este limpede că acesta a scăzut dramatic în ultima perioadă de timp.

Dacă e să ne uităm doar la protestele care au loc acum în Europa, putem lesne înţelege că încrederea în abilitatea statelor de a gestiona criza actuală a fost puternic zdruncinată.

În plus, alegerile nu mai sunt demult despre ideologia de stânga sau de dreapta, ci despre cui ne dăm încrederea pentru a ne decide viitorul.

3.3. Să aibă integritate

Atât campania politică de anul acesta pentru alegerile locale din România, cât şi cea pentru alegerile prezidenţiale din Statele Unite au scos la iveală numeroase

nereguli care au avut loc în cadrul procesului electoral şi care pun la îndoială, nu doar integritatea conducătorilor politici, cât şi democraţia însăşi.

În plus, oricât de mult am implica tehnologia în procesul politic, ea este, până la urmă, coordonată de indivizi. Iar lipsa de integritate şi onestitate a unora dintre cei care decid soarta naţiunii nu poate fi rezolvată prin algoritmi, oricât de sofisticaţi ar fi ei.

Poate că e uşor să te pretinzi a fi integru, dar cu toţii am întâlnit situaţii în care integritatea ne-a fost testată. De aceea, considerăm că, indiferent de gradul aplicaţiilor inteligenţei artificiale, integritatea este şi trebuie să rămână o caracteristică esenţială a liderului politic.

Iar acest lucru presupune ca liderul politic să facă ceea ce este corect şi drept, nu să îşi fundamenteze alegerile strict pe baza opiniei publice.

3.4. Să fie adaptabil

Adaptabilitatea înseamnă „capacitatea de a răspunde ameninţărilor şi oportunităţilor pe măsură ce ele apar." [3]

La nivel individual, presupune ca un lider politic să fie „deschis la idei noi şi chiar să îşi poată schimba opiniile." [3]

De asemenea, „liderilor adaptabili nu le e teamă să îşi asume o nouă direcţie atunci când situaţia o impune" şi, astfel, ei se focusează pe învăţare, şi nu se încăpăţânează pe a avea mereu dreptate. [4]

Altfel spus, un lider politic adaptabil trebuie să îşi poate schimba comportamentul pentru a fi mai eficient în mediul în care operează sau chiar pentru a face modificări mediului respectiv.

3.5. Să îşi (re)cunoscă propriile limitări

Niciun om nu poate cunoaşte toate aspectele dintr-un domeniu sau despre o anumită chestiune, chiar dacă e lider. Iar liderii politici inteligenţi sunt cei care au capacitatea, dar şi curajul, de a recunoaşte lucrurile pe care nu le cunosc.

3.6. Să comunice eficient

Motivul principal pentru care unii politicieni români nu reuşesc să inspire schimbarea pe care şi-o doresc este legată, în mare măsură, de lipsa abilităţii lor de a comunica în mod eficient cu partenerii politici.

Prin urmare, capacitatea lor de a influenţa unele decizii politice este, de multe ori, limitată. Oricât de bune ar fi măsurile propuse, ele nu vor putea fi transpuse în realitate şi asta pentru că nivelul de la care comunici este nivelul de la care conduci.

Cu alte cuvinte, poţi fi un politican foarte bun, dar un lider slab. Astfel, "adevărata măsură a leadership-ului este influenţa – nici mai mult, nici mai puţin."

Iar capacitatea de a conduce „nu poate fi obţinută prin intermediul unei numiri într-o poziţie sau prin primirea unui titlu. Ea se naşte odată cu influenţa...şi trebuie câştigată." [2]

3.7. Să aibă umanitate

Unul dintre aspectele captivante ale lumii moderne este leadership-ul hibrid. Fie că vorbim de domeniul politic, economic sau social, azi conducerea este exercitată atât de către indivizi, cât şi de algoritmi.

Întrebarea este: cât ne (mai) conducem pe noi înşine şi cât ne lăsăm conduşi prin prisma sugestiilor şi percepţiilor care provin din lumea virtuală?

Desigur că, în spatele acestora se află mintea şi efortul unui om. Dar, acest lucru nu este de ajuns pentru a garanta o orientare centrată spre om şi umanitate.

Dacă e să avem în continuare o „lume" în care omul este un scop în sine, şi nu un mijloc, atunci liderii politici ai viitorului trebuie să afirme şi să susţină cu precădere valorile rasei umane, astfel încât ele să prevaleze în faţa oricărei inteligenţe artificiale.

4. Concluzii

Pandemia de COVID-19 ne-a pus faţă în faţă cu cel mai aprig duşman al umanităţii: noi înşine.

Modul în care au reacţionat liderii politici români la întreaga situaţie nu reflectă decât imaginea unei societăţi bolnave, nu de coronavirus, ci de nepăsare, delăsare, neputinţă şi dezolare. Iar acest lucru se petrece în fiecare zi, de 30 de ani încoace.

De aceea, mai mult ca oricând, avem nevoie să depăşim această stare de inerţie mentală şi să trasăm noi direcţii în ceea ce priveşte politica viitorului. Iar această politică trebuie să fie una a demnităţii şi prosperităţii umane, dar şi adaptată la trendurile tehnologice.

În plus, oricât de sofisticată ar fi tehnologia, ea nu va putea înlocui vreodată conştiinţa umană şi nu se va putea transpune în rolul de lider politic.

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The future of bioenergy as a component of smart cities

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Abstract

A thematic in vogue nowadays is bioenergy evolution as a solution for sustainable development, certain global conflicts, etc. Undeniably, bioenergy represents future energy as a component of smart city development. The main problem today is that resources used to obtain energy are limited, non-renewable and unequal distributed on the planet but the energy consumption is growing. Humanity has to find other sources of energy besides oil, coals am gas. There are two directions: nuclear energy and bioenergy. The second option is preferred to be developed for security reasons. The problem in obtaining bioenergy is that storage methods are not efficient for the moment and its production is not equally distributed for the entire period of the year in most states. The purpose of this article is to analyze the future perspective about the strategic resources in the global context where the most important factors are: political environment, usability, price vectors, technologies, and sustainable development.

Keywords: *smart city, bioenergy, strategic resources.*

1. Introduction

The importance of energetical resources is so accentuated due to unequal distribution combined with the energy needs of our society. Thus, there are a lot of diplomatic and military conflicts aroused all around the world because of them. For example UE vs. Russia (diplomatic conflicts for gas), Iraq vs. Kuwait (military conflict for oil) etc. On the other hand, in opposition to the conflicted attitude, states

often are integrated into strategic alliances made for better access to resources. This subject can be approached through certain perspectives.

Firstly, considering the environmental impact of fuels that generate a lot of pollution affecting human health, the next generations and a lot of animal species. Politics is another factor that can easily change the direction of energy evolution. The main reason is that there will be always a battle between states for power and influence. Moreover, a resource is called "strategic" when it is a part of certain strategies that a state wants to apply on the global stage. The technological is shaping up a frame for bioenergy development. The rentability of bioenergy projects depends on the research advance.

The first section will analyze the past and the present in order to understand how the future of bioenergy can be developed as a part of the smart cities concept in contrast with the old sources of energy as fuels. In the beginning, will be defined all the topics relevant to bioenergy. Also, the topic of conflict will be addressed and the alliances of the states.

The second section will contain the actual stage of energy development, pros, and cons for bioenergy and in the last section will be discussed the most important topic of the paper: the future perspective of smart cities through an energy view.

2. The past and the present of energy in a global perspective

Natural resources are defined as natural elements exploited by humans for achieving social welfare but just that resources that have a real impact on social and economic development, unequally distributed on the planet, could be called strategic resources.

Since the XX century, this category is represented by the next energy resources: oil, gas, radioactive metals. It is considered that the global resource for nowadays is the oil and gas is just a regional one even though, in the past, due to the industrial revolution, the most important source of energy was the coal. That period was the beginning of the energy domain supremacy in the economic global context. The atomic energy, besides the other forms of energy, is approached in a different way because of the risks involved. [1]

Global conflicts become atypic in the XXI century due to the technology advance and globalization. An atypic conflict represents a combination of different battle manners, conventionals or not including activities against international low as terrorism, organized crime, mass-media. These tools are used to create an impact on the political and economic environment.

Hybrid war is made by armed battle Through conventional and unconventional methods as manipulating the autochthon people for obtaining political influence in the conflictual area. In this way, the territorial conquest is eased. The political factor becomes complemental for the military one. For example, a separatist movement can be financed by a state which aims to send their armed forces in order to conquer the territory as it happened with the annexation of Crimea by Russian. [2]

Concomitant with military wars, in global politics, is looming economic strategies. Often, the political component comes first over the economic one. This fact is well shaped up in the Donbas conflict. The Russian strategy was to offer gas at a preferential price to the post-Soviet countries (among them Ukraine) exchange for some concession as giving up the aspirations for UE (European Union). Thus, economically this measure is a disservice for Russian but through a geostrategic view, it held back the advance of occidental frontiers in the East of Europe when the Russian goal is to consolidate its influence on the continent. [3]

Well-known are the Middle Eastern conflicts, the most strained zone in the world due to the oil reserves, 47% of the global reserves (Iran 9,3%, Irak 9%, Kuwait 5,9%, Saudi Arabia 15,6%) what prompted the involvement of more states in the local conflicts, states as the USA, Russian, Poland, France, UK etc. The Middle East states are the most imports important oil suppliers for the international market so the stake is big. The most important conflicts of the XX and XXI century were in these areas (The first oil crisis and The Arab-Israeli war from 1973, The second oil crisis from 1979, the war Iran-Iraq from 1980-1988, Iraq invasion of Kuwait from 1990-1991, the 2003 invasion of Iraq. [1]

The first and second oil crisis left behind an increased geostrategic interest of the occident aiming oil-producing countries. The crises make the states realize how important oil access is and also, the influence of global market prices resulted. After the first oil crisis, the USA lost the influence in Iran and Iraq damaging the trade relations based on oil. This impediment is easy to transform into an advantage for Russian. In this context, SUA was implied in the next wars where a key role was played by Saddam Hussein, ex-CIA agent. [3]

Geostrategic resources play an important role in the development of a state economy based on a hard to control dependency for energy. At this level, in international commerce shall be deducted strategic features that inhibit the free-trade notions. Therefore, trade, for some producing countries, is made under a strategic and political approach meant to function as declarations of power on the international plan. For other states that have to import energetical resources, the strategy is to obtain a good price and limitate the energy dependency, so they have to increase the number of countries that they import from. The main problem is that if you are energetically depending on one single state that exports to you the resources that you need, that state can blackmail you to make some compromises under the threat that you will not receive these resources anymore. It is a very important fact as long as it can be seen, on a large scale, that the most developed countries are the biggest consumers of energetic resources and the technology development that is vital nowadays is depending on the energy domain. Furthermore, a new supplier is hard to contract because these kinds of resources are concentrated in not many areas and there are not too many countries that export them. That is the feature that includes the trade with energetical resources in what it is named strategic trade through are made a lot of diplomatic conflicts and alliances. Examples of alliances are OPEC Organization of the (Petroleum Exporting Countries) and GECF(Gas Exporting Countries Forum) and another diplomatic

conflict can be considered the project NABUCCO with its challenge with Russian projects: Blue Stream, South Stream, and North Stream.

Nabucco was a 2004 Austrian project initiated by the USA in 1996 that aims to diversify the delivery routes and the suppliers resulting in economic rentability and energetical security. The start for Nabucco happened when Russian used the "gas tap" during the gas war. This movement symbolized the transition from "hard power" made through military pressure, to "soft power" made through energetical pressure, both of them being equally efficient. Thus, the Russian reaction when Ukraine and Georgia wanted to accede to the EU was to stop providing gas to then in the winters of 2006, 2008 and 2019. The problem was that the Ukraine and Georgia accession to UE means that they are getting out of the Russian influence in the East of Europe and It was a big wake-up call for UE concerning the risks of the future. [4]

Blue stream was the first step made by Russian to give an alternative to Nabucco. It had a big success due to the very optimistic view of UE that considered that in the future the consumption of gas will increase so much so Blue Stream will remain just an alternative to Nabucco, the Nabucco route will be undoubtedly necessary for covering the consumption. Nowadays, Bluestream is finished and UE needs no more economically Nabucco. Now, a new route is efficient just strategically. The results were narrowing the Nabucco project and accentuating the dependency of the transit zone Turkey.

Nord Stream is another Russian project in competition with Nabucco. It was launched in 1997, has started in 2005 and is finished since 2011. Nord Stream is engineered for the direct distribution of gas to Germany. Nord Stream is the friendship result of the German chancellor Gerhard Schroeder and the Russian leader Vladimir Putin.

South Stream is the Russian version for gas supply in the South and the center of Europe. It started in 2012 and was ready for use in 2015.

Shall be observed that the difference is made by objectives. The European one was firstly economic and then strategic but the Russian objective is purely strategic. For the UE is not cost-effective to invest in strategic infrastructure. [5]

Bioenergy has more advantages compared with the old sources. One of them is about the ecologic domain. The pollution is one of the most debated subjects where pollution is discussed as being one of the most dangerous problems nowadays that can affect us and the next generations. Oil and gas consumption results in carbon dioxide, nitrogen oxide, sulfur dioxide, and other derivatives that are eliminated in the air and generate a high level of pollution. For example, when the principal chemic component of natural gas, methane, is burned, the equation (1)is happening:

$$CH_4 + 2\ O_2 = CO_2 + 2\ H_2O + \text{energy released} \quad (1)$$

Where:

CH_4= a methane molecule

$2\ O_2$ = two oxygen molecules

CO_2= the molecule of carbon dioxide

$2\ H_2O$= two molecules of water

Liquefied natural gas has a double carbon concentration and ethane is the principal chemical component that substitutes the methane. Thus, liquefied natural gas pollutes twice as its gaseous form. It is due to an increased level of density. For the liquefied natural gas, the equation (2) is happening:

$$H_4 + 3\ O_2 = 2\ CO_2 + 2\ H_2O + \text{energy released} \quad (2)$$

Where:
H4= a hydrogen molecule
3 O2 = three oxygen molecules
2 CO2= two molecules of carbon dioxide
2 H2O= two molecules of water

Oil represents a mixt between gaseous and liquid hydrocarbons and it is more pollutant then the natural gas. However, the amount of carbon dioxide emitted increases faster compared to the energy generated, which can further lead to an economic-ecological inefficiency in the use of hydrocarbons. Although carbon dioxide is not a toxic substance, due to the large amount that exists in the atmosphere, it generates climate change. It helps the atmosphere to absorb more heat and reflect less, which results in global warming.

Oil is a dense hydrocarbon and contains more impurities that react with other components and become harmful. Among the pollutants emitted by combustion are sulfur dioxide and nitrogen oxide. The two substances are the precursors of nitric acid and sulfuric acid, which are the main determinants of smog and acid rain. Acid rains, most of the time, have devastating effects on flora and fauna, even on the human body at direct contact. [6]

3. The future of energy resources -bioenergy

The geopolitical climate of strategic resources changes over time. As can be seen, resources have increased or decreased in importance depending on technological evolution. In the beginning, pastures and fertile soils were considered the most important resources, then steel and cast-iron. The interests have changed with the Industrial Revolution when the eyes were focused on coal, today oil is considered the most important global resource and it is certain that it won't remain forever.

Fossil fuels are present on Earth in limited quantities and have an unequal distribution across the globe which creates a dependency for some states and represents a significant advantage for others. In the last period, due to technological advancements, it is tried to limit the dependencies by accessing other more accessible forms of energy that can offer favorable perspectives in terms of energy security. [7]

As history has shown, the transit to a new type of energy used by the masses is relatively slow, gradually. For example, approximately 100 years were needed to increase the global demand for coal from 10% to 60%. In the case of oil, from its introduction on the market until reaching a global quota of 50%, it has passed about 60 years.

The world tends to green energy. There are multiple reasons. Global warming and the current level of pollution raise concerns that cause states and international

organizations to encourage the research, development, and implementation of the technology required to obtain bioenergy.

From another perspective, green energy comes from various sources, mostly free (wind, solar, hydro) or easily accessible sources (ethanol obtained from various plants such as sugar cane). Thus, by using it massively, many states will become energy independent. At the same time, although the current technology for obtaining and storing it, is relatively expensive in the long term, it is much more profitable, especially because the environmental costs are minimal. [8]

US President Barack Obama said in one of his speeches that the nation that will rule the world will be the nation that will be the leader in the production of bioenergy, adding that the US will have to be that nation. Geopolitical, green energy will become that resource fairly distributed across the globe, accessible and free of charge, will change the global climate leaving the period of oil glory somewhere in history. Those who master the technology and use it at high capacity will gain a significant competitive advantage over the other states. [9]

The speech of the US President is complemented by the evolution of international investments. For example, in 2004 they totaled $ 36 billion, growing at a rapid pace and reaching in 2010 to $ 145 billion. [10]

The transition to the new energy era depends on cooperation between states from several perspectives:

- Intellectual property rights over clean energy technological innovations,
- Redirecting capital flows to research, development, and implementation of green energy,
- Limited access to the necessary supplies,
- Increasing the importance of bioenergy in international diplomacy.

The declining price of the technology used determines the accessibility that was missing from the new type of energy. However, for the technological advancement of a state in the biofield, states must focus more on long-term support, and also the capital market. [11]

There are already forms of geopolitical uses of it. For example, in countries from the Russian sphere of influence, Eastern Europe (Belarus, Bulgaria, Poland), green energy is used as a barrier to the Russian gas monopoly. The more they make their presence on the market (the power of the wind and ethanol extracted from the biomass used), the more the natural Russian gas loses its importance.

It can be seen new interstate relations and connections between regions. For example, France's effort known as the "Mediterranean solar plan", which consists of concentrating solar hubs in North Africa in order to improve energy security for countries such as Jordan and Morocco but also for European countries that will benefit from solar energy exports of Africa. Another example of collaboration is the strategic alliance between the US and China to manage solar power hubs in Abu Dhabi and solar charging bases in Iran. [8]

With biofuels already in use and electric cars put into circulation, oil is losing importance. On the other side, investments in ethanol have begun to form as a competition for OPEC member countries.

Green energy has succeeded in shadowing even the investments in nuclear energy which, although considered a non-polluting approach, is also a dangerous variant for international security. Due to uranium, the chemical element used to obtain nuclear energy is used in the manufacture of bombs and the technology is similar, this alternative is not well seen. Although it is a cheap form of energy, following World War II it proved to be dangerous enough to be unable to compete with oil today.

Thus, the impact of green energy in geopolitics is materialized by:

- Balancing regional powers,
- Modification of the international account,
- Outlining new strategic relationships.

Although the methods of producing renewable energy that will be used to replace today's fuels are not too accessible. They have a significant disadvantage that slowed down their use rate, such as the lack of an easy storage method for large quantities, there is no possibility of being constantly obtained, natural phenomena not being constant and predictable in the long term.

For example, energy can only be taken from the sun during the day, but it is also necessary at night. The energy that can be taken up during the day is often excess and can cover the need at night but a storage technology is required with a very large capacity. The greater the storage capacity, the longer the energy taken can be stored, distributed to more consumers, offers more security. [12]

The viable technology at the moment is the invention of the physicist Nicola Tesla: the lithium-ion battery. Although not a 21st-century invention, its mass use has been avoided due to high manufacturing costs. The technology has been improved and costs have decreased significantly in the last years (for example more than 14% only between 2007 and 2014 for lithium-ion batteries) becoming sufficiently accessible so that the storage and use of bioenergy become competitive with fuels energy. Significant price drops are expected due to technological advancement and mass production that will start in 2020. In figure 1 can be observed a parallel between cost estimated and demand estimation. [13]

Batteries work through a number of electrochemical cells that use their chemical property to store energy and convert it into electricity. For large batteries used in green energy storage, low-temperature lithium-ion batteries are used.

Lithium-ion batteries are also used for: mobile phones, laptops, but also electric cars, the efficiency of lithium in battery composition being up to three times higher than for other elements. Lithium is used as a medication, too.

Electric cars with lithium-ion batteries are more efficient, less polluting, less loud, accelerate faster and you have to invest less than those running on fuels.Lithium gives the battery, compared to other chemical elements, advantageous properties such as:

- Higher storage capacity for less substance (which reduces battery size),
- Higher power,
- High density due to the energy content of the battery cell,
- Longer battery life, aging, and degradation are slower,

- Maturity and Safety at the battery cell level,
- High supply capacity,
- Favorable loading/unloading characteristics,
- Efficiency in cycling and self-unloading,
- Low cost of batteries and materials,
- Lithium-ion batteries (like other batteries) can be recycled. [13]

The US-initiated project in Nevada "Tesla`s Gigafactory" aims to propel the US state to the first position in Tesla battery production. It started operating in 2017 but will operate at a maximum capacity of 35 GWh of batteries per year starting in 2020. Due to this project, the US will exceed the current global total production. [7]

Currently, the states that are most encouraging the use of Tesla batteries for bioenergy storage are China, Germany, Japan, and the USA. These states are also noted for their support programs for citizens:

In Germany, 30% of the installations costs used in the individual production of bioenergy are subsidized, while Japan subsidizes with over 50% of the costs with the lithium-ion battery installations.

Programs for the implementation of green energy storage systems are being developed in states such as Hawaii, New York, Texas. China is noticed as the largest storage capacity regarding the hydraulic pump. California is the state that aims to make 33% of energy green in 2020 and 50% in 2030, performance supported by support programs. [13]

Australia is expected to be one of the largest markets. Currently, 15% of the houses on the territory of the state use solar installations and their number is increasing. The country has much solar potential and could be a strong exporter of solar energy in the region. Here energy is stored when the price is low and used or distributed when the price increases. A household uses about 80-60% of the energy stored. [10]

As a general remark, we can point out that the field of green energy stored with the lithium-ion battery has an increasingly advantageous character for global politics, environment and business environment. Profitability encourages private investments. Environmental and geopolitical factors encourage states to invest. [8]

The forecasts are the more favorable the more they are expected to make new discoveries regarding chemical reactions of lithium with other elements which would generate lower prices. Over time, humanity can reach the point where the use of oil as fuel is no longer profitable. In figure 2 it can be observed the price evolution of lithium-ion batteries materials.

In the graph above it can be seen that the price for lithium is relatively low compared to the chemical elements price. The technological advancement that leads to lower prices. It is a result of discovering new alloys that have an interaction similar to that of cobalt. Cobalt is a chemical element used initially and it is still used in bioenergy storage. Cobalt is much more expensive compared to the basic elements of the battery. [10]

The high level of technologization that the experts expect to increase in the next years will cam with more than cheaper prices for energy, but also with new

methods to reduce consumption. With sensors help people will control it better through monitoring and making smart some functions as turning on/off the lights.

We can say that lithium will become the resource of the future, probably the most important because, without it, green energy cannot be stored in profitable conditions. Under this condition, Lithium can be the next global resource that can help our society to integrate better in the smart cities environment that will exist for sure in the future?

4. Conclusion

With the increasing importance of the energy field, the concept of energy security has been developed. This reflects the regional character of the geostrategic resources, which aims to reduce the dependence of the consuming states on the producing ones.

Energy investments are increasing in relation to the extent of resource use, the most favorable prospects are those of bioenergy which has registered significant increases in recent years It is expected that the growth trend will be increasingly accentuated due to technological innovations in the bioenergy field. It will bring lower production costs and increased profitability. In my opinion, geostrategy of resources will continue to exist but of a smaller size as the resources used in the energy field will become increasingly accessible through the implementation of new technologies for obtaining and storing bioenergy.

As our society is based on bioenergy, it strengthens its position from year to year. its importance could increase in the future. By adopting a new form of energy, some states, which have recently been neglected in global politics, will acquire strategic qualities and others will lose. Also, bioenergy, due to technological advancement and the ecologic dimension, will favorize the creation of smart cities where everything is high technologized following the concept of sustainable development.

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Cyberbiosecurity. A short review

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Abstract

In the new digital age, life sciences tend to converge with information technology and cybersecurity. With the new developments in biomedical research and the scientific progress of modern biotechnology, there is an exponential multiplication of related information sets, which require cloud storage and advanced methods of management and analysis, as well as ensuring an adequate protection of their content.

The bioeconomy global landscape involves common, multiple and diverse actions (i.e specific policies and framework regulations, international cooperation, national collaboration among interdisciplinary sectors and different actors of the public-private system). At the same time, biosecurity issues highlight a complex and rapidly emerging ecosystem, which involves high-risk vulnerabilities. Moreover, the current pandemic context, generated by the global spread of the new virus, SARS-CoV-2, has pointed out some issues (i.e the importance of strategic autonomy in supply chains - food, medical and pharmaceutical products, the development of critical functional infrastructures, the appropriate prevention and protection measures, including the management of rapid and effective responses to pandemics or other potential malicious actions with regard to the use of infectious biological agents, natural or artificial).

As science evolves, relying on the application of new technologies in areas such as artificial intelligence, process automation, bioinformatics and synthetic biology, vulnerabilities such as data confidentiality (i.e clinical, genetic information), cloud storage, intellectual property, may represent opportunities which could be exploited. Cybersecurity needs to be as robust as possible, anticipating and incorporating possible biological threats into its strategies.

This paper presents a synthetic overview of cyberbiosecurity available data, with the view to emphasize some of its strategic approaches currently used in the world/at the international level.

Keywords: *modern biotechnology, synthetic biology, big data, cybersbioecurity, biosecurity.*

1. Introduction

Latest industrial biotechnologies have gained great interest, due to their wide applications in the economy, human health and environmental protection, areas which are facing global challenges and have generated and still generate deep concerns regarding climate change, environmental pollution, human and animal health, natural resources and biodiversity loss, food shortages and water scarcity. [35]

In a world which is racing in the fourth industrial revolution and also, in the new era of digitalization, there is an increased demand for alternative technologies and sustainable products based on the principles of bioeconomy, such as alternative energy sources, biomass conversion processes, bio-based bulk chemicals, biofuels, renewable feedstocks and medicines etc. Biotechnology has an enormous economic potential and, at the same time, it is promoting innovative applications for our common benefits; it could be considered as a sustainable tool for our future development, in which –omics sciences (genomics, proteomics, metabolomics, transcriptomics) and synthetic biology are used to cope with the most challenging global problems. [35]

Furthermore, in a context which estimates an increase of the global population to 9 billion by 2050 (United Nations: approximately 66% will be urban populations; World Health Organization: 1.5 billion people will be over 65 years), concepts such as smart and climate-neutral cities are gaining the attention of governments and regional/local authorities. World's largest cities have already adopted smart sustainable development goals, decision which has set the path for an estimated global market of $ 1.565 trillion by 2020. This means that smart cities decision-makers have already adopted the paradigm shift, that which we have noticed is being talked about more and more in the current pandemic context of COVID-19, and which means digitalization and implementation of modern and scientifically advanced technologies (i.e to develop smart infrastructures, including to store and manage big data, to automatize technological processes - robotics, systems of communications – WiFi and 5G Internet of things (IoT) technologies). At the same time, this shift creates new risks (often identified as vulnerabilities and threats), especially in terms of security (including cybernetic security, given that all these technologies, sensors, networks and infrastructures are based on internet access). In a report of the European Cyber Security Organisation (ECSO, 2018), the smart city was defined as a complex task, “the integration of data and digital technologies by the human being into a strategic approach to economic, environment, social, technological sustainability for citizen wellbeing”. [2, 4, 8, 12, 37]

As regards the global level, ECSO estimated that approximately 50 billion devices will be connected to the Internet, by 2020, including an increase of 23.97 trillion USD for the Internet of Everything (IoE) market. This represents a real motivation leading to new strategies development, which are necessary to implement (IoT) architectures, and which are not limited to the smart city concept, but also include areas such as human health, agriculture, environment, transport, research & development and education, in which applications of modern biotechnology are successfully replacing devices, chemicals, fuels and energy, foods,

therapeutics etc. From this perspective, special attention should be given to cloud computing (storing big data on cloud platforms) and to the potential of artificial intelligence and special algorithms assessing and analyzing big data. In fact, biological sciences interact with information and computer sciences, being convergent, and such a phenomenon provides opportunities for new emerging fields of multidisciplinary study, like cyberbiosecurity.

Limitation of the study: Although the scientific information regarding the emergent discipline of cyberbiosecurity, especially related to its potential risks (i.e. for people, environment, economy, national security etc.) is not abundant, the present study had briefly reviewed a number of 30 specific articles only to give an overview about the meaning of cybersecurity and biotechnology interactions; also, it is worth noting that scientific papers related to the biosecurity and biosafety field, have not been assessed, due to the huge amount of available data, and mostly due to their impact on both of the strategic/governmental area (including measures and implementation actions at national level) and the technical applications in the multidisciplinary fields involved.

2. Methodology

The methodology utilized in this paper has involved a review method (similar with the scoping review), in which knowledge related to the cyberbiosecurity has been synthesized with the view of a preliminary assessment of a planned theoretical study aiming to encompass larger information about international biosecurity strategies.

3. Cyberbiosecurity

As previously mentioned, biotechnology touches a wide range of economic sectors and generates large percentages of GDP from different industries. One of the major challenges of the 21st century is to develop new bio-based products (including therapeutics and medical devices) or to enhance the quality of the existing ones, in order to obtain novel materials with new properties, and to optimize sustainable technologies for a competitive growing bioeconomy. As regards modern biotechnology, emerging technologies and products (food and feed, pharmaceuticals, chemicals etc.), based on genetic engineering and molecular biology, find applications on the global market, and some of them are completely revolutionary as they prove multiple benefits for the environment and the human wellbeing. In a nutshell, biotechnology is classified on the basis of a “Rainbow code” (since 2012), in which each color is characteristic for a specific area of study/interest, such as: agriculture and environment are represented by green, industrial biotechnology and environmental engineering by white, human health and medicine by red, nutrition and insect biotechnology by yellow, aquatic resources by blue, bioinformatics by gold, arid lands by brown, ethics and law by violet, and bioterrorism and biological weapons by dark/black. Genetically modified (micro)organisms, transgenic organisms, biopolymers, cosmetics, biofuels,

additives, pigments, pharmaceuticals (antioxidants, antimicrobials, antitumorals) represent some of the most important biotechnological applications. [35]

3.1. The need for cyberbiosecurity

3.1.1. Context

Important definitions:

- Article 2 of the Convention on the Biological Diversity (CBD) provides a general definition of "*Biotechnology*", namely that it is "*any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use*". [15]
- European Commission defines "*Bioeconomy*" as a bio-based sector, relying on "*biological resources (animals, plants, micro-organisms and derived biomass, including organic waste), their functions and principles*" and excluding "*health biotechnology and biological medicines*". [16]
- "*Biosecurity*", according to Food and Agriculture Organization of the United Nations (FAO), means "*a strategic and integrated approach to analyse and manage risks in food safety, animal and plant life and health, and biosafety*". [17]

Nowadays, the society faces new challenges, generated by the beggining of a digital era, but also of the 4th industrial revolution. [24] The bioeconomy is a fast-growing sector [27], (in the US it is considered to be the main driver of national GDP, accounting over USD 4 trillion, approx. 25% of US GDP, in 2015) [11, 30], and research and innovation are recognized as priorities for funding and investments, due to their development potential and for their societal benefits. [22] Modern biotechnology has generated multiple industrial advantages, with concrete benefits, but at the same time, (bio)innovation coupled with the implementation of advanced information technologies has identified some new exploitable gaps, and also new risks (although many hypothetical). [7] There is an interest to include elements of economic analysis in the impact assessment undertaken for strategies promoting bioeconomy development and protection, but also to highlight the need for innovative cybersecurity solutions and robust measures to ensure the security of biological infrastructures and biodata. [23] The absence or insufficient control over biological information and materials may involve serious problems, for the economic and national security, but also for human health or the environment. New biosecurity risks have emerged along with the scientific and technological progress due to the convergence of life sciences with computer information sciences, leading to the need for development of a legislative framework to address biological cyber threats. [23, 25]

The field of biotechnology has substantially changed in the last 10-20 years and as regards the emerging new cyber-physical characteristics, only a limited expertise to identify, classify and assess these rising issues is available. The interactions between modern biotechnology and advanced IT technologies (artificial

intelligence, automation, robotics) have led to successful applications, especially in fields such as health (i.e. precision personalized medicine, biomegatronics, smart biosensors), biopharmaceuticals (e.g. development of new drugs, gene therapies), agriculture (i.e. precision agriculture) and, last but not the least, to a revolution in the field of genomics, through the discovery of genome editing technology (CRISPR/Cas9). [5, 26] Thus, a new paradigm has emerged, as a hybridized, interdisciplinary field, known as the cyberbiosecurity, which describes an intersection of disciplines that can not be found in another sector. [25]

3.1.2. Issues and needs

Digitalization, the rapidly growing bioeconomy, and the dependence on biotechnology, as well as the scientific progress of synthetic biology, coupled with dual-use research has led to a new vision and strategic planning on the need to respond to emerging new threats (such as cyberbiological), to develop and to implement measures for the protection, prevention and mitigation of these risks or other potential issues related to ethics, national security, resilience, etc. [36] In other words, digitalization of biological information entails a number of vulnerabilities, threats and risks. Cyber attacks could generate significant impacts on the national bioeconomies, like orienting production towards malicious purposes (i.e. low quality products, loss of technological process integrity, changes in manufacturing infrastructures), threats to patients health (i.e. inefficient medicines, loss of bioproduction, hazardous lots of therapeutic drugs unauthorized access to biomedical data, stealing of trade secrets, loss of intellectual property and of commercial advantage, algorithms or software that may influence the R&D processes, ransomware attacks, data coding, malware coding in DNA etc. [23, 24, 29] Computational biology generates additional security issues and risks that emerge at the border between biotechnology and cyberspace. [29, 34]

At the present date, policies that manage the risks posed by the biological sciences, in which potential threats are traditionally addressed, are divided into two categories, namely biosafety and biosecurity; some examples of biological threats are: exposure to pathogens or toxins or their release into the environment (through accidental or unintentional actions), and their deliberate spread, endangering human, animal and plant health, food supply, etc. (acts of bioterrorism). Existing policies manage a limited number of threats, and the emergence of new risks due to the multidisciplinary nature and the convergence of biological sciences with IT, triggers the need for a cyberbiological legislation, but only after conducting specific research in the field of biological materials and their associated data protection. [10, 29, 39] Specifically, it could be identified needs, such as: an enhanced awareness regarding new threats as a consequence of rapid technological advancement and numerous innovations in life sciences and IT, as well as due to their potential impact on the bioeconomy, society and even national security; a specific regulatory framework development and dedicated measures implementation; a new culture of cyberbiosecurity responsibility, for which is necessary a sustained effort of cybersecurity experts and from those of the life sciences; building a common

language that promotes cyberbiosecurity, as an emerging discipline that requires extra attention from governments, academia and R&D, and particularly from industry; identifing vulnerabilities and creating an effective risk management to protect data security, human health and environment, while providing an enabling framework and adequate funding for cyberbiological innovations.

3.2. Synthetic biology

According to the Royal Academy of Engineering, the synthetic biology "aims to design and engineer biologically based parts, novel devices and systems as well as redesigning existing, natural biological systems". [33]

3.2.1. A short history

Nucleobases, as a base for life on Earth, and which are found in the composition of nucleic acids (DNA and RNA), are arranged in an "alphabet" code through which genetic information is transmitted. During the evolution of the species, they have not changed, but in recent years, with scientific advances, researchers have developed some new pairs of bases; and this could lead in the future to a potential new genetic "alphabet". These artificial pair bases have demonstrated the ability to replicate and function alongside natural nucleobases. Alexander Rich designed a third pair of artificial bases as early as 1962, and pioneering studies related to the study of this newly identified pair started in the late 1980s. [14]

Genetic engineering has its origins in the 1970s, when recombinant DNA technology was discovered, allowing the development of new functions in host organisms. In recent years, the biological sciences, along with bioinformatics have rapidly evolved and made possible genome sequencing and *de novo* synthesis. Moreover, technologies have become more accessible and cheaper. First genetic circuits were created in the 2000s, and a revolutionary method was discovered in the area of genomics in 2013, namely CRISPR-Cas (Clustered Regularly Interspaced Short Palindrome Repeats Cas system) and for which scientists behind it were awarded with the Nobel Prize in Chemistry in 2020. The first genome – of the poliovirus, was synthesized in 2002; a prokaryotic genome, specific to the *Mycoplasma genitalium* JCVI-1.0 strain, was synthesized in 2008; the first artificial cell – Synthia, was created in 2010. All of these discoveries have been triggered more ambitious objectives among scientists, and this led to the Human Genome Project-Write (HGP) launching in 2016, with the major goal to synthesize a complete human genome by 2026, with an estimated funding of USD 100 million. [40]

The field of synthetic biology involves multidisciplinary research, combining biology with chemistry, mathematics, computer science, physics and engineering, and its available funding (public and private) demonstrates the enormous potential for future development and applications.

3.2.2. Applications

Bioinformatics has generated exploitable new targets for cyber attacks, along with synthetic biology evolution (which includes the use of synthetic metabolic engineering techniques to design and develop new genetic circuits). One of the sectors in which synthetic biology and transgenic technologies have a large applicability is that of agricultural and food system R&D. Genetically modified organisms have been included in international and national regulatory policies, but nowadays there is a global trend to promote an industrial transition to obtain food from genetically modified crops, of course using precautionary approaches; however, the need for an update of the existing legislation through some new policies dedicated to monitor products resulting from the application of synthetic biology technologies, as well as setting ethical standards and principles, is a serious reality. Changes in traditional industries, which occurred as a result of the modern biotechnology uses, have led to emerging bioeconomies, but also to solutions for many associated issues related to human health and environment. Transgenic technologies, through which an exogenous genetic material (and more recently, artificial genes) is introduced into the genome of an organism, and which causes approximately predictable changes, or genetic editing, in which the genome is edited accurately but with possible off-target mutations, are increasingly assimilated in agricultural research. In 2018, 191.7 million ha of genetically modified crops were reported worldwide (obtained through the application of transgenic technology), while in 44 countries and regions, products thus obtained were imported (e.g. corn, soybeans, rapeseed, beets, cotton), as processing raw materials. The largest producing countries were: USA, Brazil, Argentina, India, Canada, all of them occupying 91% of the total GMO cultivation area worldwide, but also China, recognized mainly for the production of genetically modified cotton and papaya. By means of synthetic biology, metabolic pathways of plants are modified to improve resistance to diseases or other stressors, or to increase the efficiency of photosynthesis, and CRISPR/Cas9 technology has been widely utilized to improve stress tolerance and increase yields, in crops of rice, wheat, sorghum, rape, potatoes, soybeans, corn, mushrooms, apples, bananas, citrus fruits, and grapes. Moreover, the European Union has decided to regulate "artificial meat" in 2018, as a new food product (it can be obtained by using yeast cells, which have also the ability to synthesize fatty acids from milk or other proteins). All of these technologies could lead to undesirable effects that pose health and environmental risks. For example, exogenous genes inserted into microorganisms could lead to changes in the intestinal flora; gene transfer (e.g. resistant to pesticides, antibiotics) can occur in natural environment, and this could lead to risks for biodiversity and changes in the balance of species populations in certain ecosystems, affecting soil microbiota, invertebrates or insects, and implicitly it could contribute to changes in the soil ecology or it could lead to the development of new pathogens and to pest resistance. There are also some risks involving food safety, due to unintentional mutations following gene editing (e.g. one edited gene may affect the expression of another one), which could determine changes in the populations structure of species, and

even to migration of edited genes to other species. Therefore, a strict regulation and effective measures established for the food management (obtained by genetic modification, and from modern biotechnology uses), as well as clearly definitions of risks associated with synthetic biology, represent an international necessity (USA, EU, New Zealand, France, UK, Australia already have strict control regulations). [13]

Production of (bio)pharmaceuticals and therapeutics, such as artemisinic acid in yeast (anti-malarial drug), and the most cited example of application, attenuated pathogenic agents for synthetic vaccines, antitumoral invasin (obtained by developing a synthetic circuit using a Yersinia pseudotuberculosis strain), bacteriophages designed to produce specific enzymes to lyse biofilms, or utilization of synthetic genes (i.e specific to viruses) to rapidly diagnose diseases like Ebola or Zika (as biosensors on paper), or even the development of sustainable chemicals (biomaterials, biofuels) are amongst the most known applications of synthetic biology. [33, 40]

Some authors consider synthetic biology as of critical importance, due to its industrial potential applications, especially in the field of energy, health, agriculture and environment, and predict it „to produce a new era of wealth generation". They compare its potential economic impact with that of synthetic chemistry, from a century ago, which led to the pharmaceutical development, and assuming even more benefits for economy and society. Among both, the existing and envisaged applications (including those planned to be developed in the next 10-25 years), some are mentioned as follows: in the health and pharmaceuticals sectors – biosensors to detect different anomalies (e.g. arterial disease), urinary tract infections – UTIs (through fluorescent signals when entering in contact with pathogenic agents, including MRSA – methicillin-resistant Staphylococcus aureus) and with targeted drug delivery or to enhance human immune system, some of them associated with biologically based logic gates (i.e. AND, OR, NAND); biologically based memory; artificial monosaccharides; biodegradable nanoparticles; development of new medicines or enhancing the therapeutic properties of the existing ones (including adaptable antibiotics), with reduced side effects; tissue engineering, coupled with 3D bioprinting; in energy field – development of efficient biofuels (especially for aviation); agriculture – gene delivering technologies to produce seeds with enhanced and multiple genetic traits and to maximize the crops' production yields; environment – biosensors for bioremediation, to detect heavy metals and toxins, coupled with genetically modified bacteria, which are able to degrade or to neutralize them, or other chemical compounds (e.g. arsenium); lowering the CO2 emissions, through artificial photosintesis (artificial leaves); development of new ecological pesticides; artificial enzymes for detergent industry etc. [33]

3.2.3. Legal and ethical aspects

A definition related to a biosafety risks classification system, as promoted during a Conference of the Biological and Toxin Weapons Convention (BWC) stated that it is "the inherent capability of microorganisms to cause disease, of greater or lesser severity, in humans, animals and plants", and American Biological Safety Association mentioned the "containment principles, facility design, practices and

procedures" as important biosafety issues "to prevent occupational infections in the biomedical environment or release of the organisms to the environment". [40]

In a review paper, the authors identified 44 risks associated with synthetic biology, and related to human health and the environmental protection; the most common were allergies, carcinogens, antibiotic resistance, toxicity, different changes in the environment, horizontal transfer of genes, competition with native species, and pathogenicity. Also, European Union has funded research studies on biosafety risks in relation to the deliberate release of genetic engineered organisms into the environment, especially those used for plant growth or bioremediation. The conclusion was that these organisms had an environmental impact, but it was approximately similar to that of native microorganisms; however there is a possibility to temporarily gain a competitive advantage over native populations, but their survival depends on the ecological conditions of ecosystems. Horizontal gene transfer is a more serious risk which could cause changes in the genetic structure of the ecosystems, and especially considering that this phenomenon has a growing rate in synthetic/modified organisms than in natural microorganisms (i.e the bacterial cell has a transformation rate of 107). However, a new emerging branch of synthetic biology, xenobiology, involves the synthesis of xenonucleic acids using xenonucleotides (e.g. the non-natural base pair dNaM-d5SICS - utilized in DNA belonging to a strain of Escherichia coli), or proteins using non-canonical amino acids (e.g. L-4,40-biophenylalanine), as components that do not exist in nature, could provide synthetic organisms without any risk of horizontal gene transfer. The development of strains that have genes with increased antibiotic resistance is another potential risk that should be considered. [40]

In accordance with an accepted definition, biosecurity means "security against the inadvertent, inappropriate, or intentional malicious or malevolent use of potentially dangerous biological agents or biotechnology, including the development, production, stockpiling, or use of biological weapons, as well as outbreaks of newly emergent and epidemic disease", with the major risks mainly in the bioterrorism activities. [40]

The dual use of synthetic biology could generate biosecurity risks, taking into account that information about genome synthesis exist publicly (i.e. horsepox virus, a close relative of variola virus was synthesized using mail-ordered DNA fragments, in 2017); in addition to the extraordinary benefits of genome editing technology, CRISPR/Cas9 (i.e. its applications in human organ transplantation, development of cancer/viruses resistant cells, treatment of genetic diseases), it can also be utilized to increase pathogenicity, virulence or to produce toxins. [40]

After the creation of Synthia, international discussions approached the ethics of this subject; moreover, the former president of the USA, Barack Obama, requested a report to clearly identify the ethical limits of synthetic biology. To date, no biosecurity incidents related to synthetic biology have been reported, but risks must be considered to prevent future crises. Awareness is very important among scientific communities, which is why codes of conduct are recommended, and in some countries they are already implemented (e.g. Australia - "Code for the Responsible Conduct of Research", Japan - "Code of Conduct for scientists", China –

"Self-discipline of the moral behavior of scientific and technical workers") or are proposed (China and Pakistan - "Model code of conduct for biological scientists"). The dual use of synthetic biological research could have economic consequences and threaten national and/or international security. In this regard, the landscape of potential threats related to defense field tends to widen, including cyber attacks targeting biotech applications (threats that can endanger a national bioeconomy, and exposing it even to possible unforeseen events, such as Black Swan). [20, 40]

In 2012, synthetic biology techniques were considered by an European scientific group of representatives from France, the Netherlands and Germany to still fall within the scope of Directive 2009/41/EC on the contained use of genetically modified microorganisms (GMMs) and Directive 2001/18/EC on the deliberate release into the environment of genetically modified organisms (GMOs). However, the European Union considered that organisms and/or products resulting from the xenobiology applications should be subject to a new regulatory system, due to the fact that artificial organisms may lead to different and new vulnerabilities. [40] Under Directive 2001/18/EC, GMOs are defined as "organisms, with the exception of human beings, in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination, while organism means "any biological entity capable of replication or of transferring genetic material'. Under Directive 2009/41/EC, GMM is defined as a "microorganism in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination", while microorganism means "any microbiological entity, cellular or non-cellular, capable of replication or of transferring genetic material, including viruses, viroids, and animal and plant cells in culture". [1]

Currently, considering that about 30 nations have introduced elements in their legislations that directly or indirectly envisage the clinical uses of germline editing, scientists worldwide are calling for a temporary international moratorium on heritable genome editing (especially in embryons), but excluding it from research uses, until the new technolgies are better understood regarding the risks, ethics and social implications, and in addition, they propose extensive studies, including on human population genetics. [19]

Along with the cyberbiosecurity implications of synthetic biology, many ethical and societal issues could arise with its innovative developments. In addition to a regulation framework, these issues must be carefully addressed by scientists, ethicists, philosophers and, as well, a public dialogue must be built, both to promote the benefits for society which synthetic biology generates, but also to answer to some questions about its major objective, namely the DNA synthesis and the creation of new life forms. According to a public statement recently appeared, DNA will no longer evolve in nature, but in laboratories and clinics ("not in nature but in the laboratory and clinic"). In the US there is a concern about biosecurity risks that can be generated by synthetic biology (especially, creation of harmful organisms and their deliberate or accidental release), which are also associated with social risks. However, experts in the field of biotechnology sustain that there are no imminent problems, as survival of synthetic organisms in nature would be rather difficult than

in artificial environments, and in addition, genetic mechanisms/functions could be designed to make them dependent of artificial nutrients, etc. [33]

Therefore, ethical concerns were raised publically in 2010 (when the artificial cell Synthia was created), which led to a global debate and to the formulation of five ethical principles, namely: "public beneficience; responsible administration; intellectual freedom and responsibility; democratic deliberation; and justice and fairness". Nevertheless, a code of conduct is required for scientists in the field of synthetic biology, especially for those who conduct research with double use potential, as an important tool for responsibility, awareness, prevention and/or defense in relation to ethical and/or biosecurity. [40]

3.3. Cyberbiosecurity – a new discipline

The concept of cyberbiosecurity emerged in the US, following a study conducted in 2014 and coordinated by the FBI, the American Association for the Advancement of Science and the United Nations Interregional Crime and Justice, but also following the project led by the US National Strategic Research Institute and several workshops organized by the US National Academies of Sciences, Engineering and Medicine (NASEM). [36] Therefore it was acknowledged an emergence of a new field, addressing potential and real malicious threats with a significant impact on the bioeconomy, human health and environment, with risks of exploitation and misuse of data, materials and processes, which are generated at the interface between life sciences and digital space. [32] The new discipline started to be promoted, having its main aim to understand and manage its unique risks, associated with the interactions of life sciences and IT field, in particular those generated by the digitization and /or automation of biology and biotechnology, and which triggered a new way of thinking, due to its new vulnerabilities (e.g. a virtual environment allows access to biological materials and physical infrastructure), and which are created by digitalizing biological data and big data and cloud management, by the use of bioinformatics tools, or control systems of industrial bioproduction processes, which are connected to network and automated etc. [26, 34]

Cyberbiosecurity was introduced initially in the meaning of "understanding the vulnerabilities to unwanted surveillance, intrusions, and malicious and harmful activities which can occur within or at the interfaces of comingled life and medical sciences, cyber, cyber-physical, supply chain and infrastructure systems, and developing and instituting measures to prevent, protect against, mitigate, investigate, and attribute such threats as it pertains to security, competitiveness and resilience". [27]

As regards the convergence of cybersecurity with biosecurity and modern biotechnology, some general elements of strategies, policies and standards which apply to the virtual space activities (e.g. network security, minimizing threats, diplomacy and international cooperation, incidents response, stability infrastructure etc.) interfere with strategic approaches to human, animal and plant life or environment risks, extending the traditional biosafety landscape, which is more focused on genetically modified organisms, and includes new biological threats

which target new biotechnologies and infectious agents (dangerous pathogens), which can cause damage, while an increased attention to the scientific developments of synthetic biology, genomics, proteomics, bioinformatics (in terms of de novo synthesis of organisms, namely the manipulation of digital genetic sequences for the purpose of and biological weapons, or designing new functions in existing organisms, including the improvement of virulence, pathogenicity) is given. The FBI has expressed concerns about the use of genomic and medical data, which may be vulnerable to cyber attacks. [29, 34, 36]

Some approaches focusing on cybersecurity relation with biological sciences, exist at international level; for example, some are relevant in agriculture and food systems and they were initiated in the UK, some contribute to train professionals in this field and were initiated in the US, through NICE (Cybersecurity Workforce Framework), or some are concentrating on the applications in precision medicine, using genetics and artificial intelligence, at China initiative. Moreover, in literature it is mentioned the competitive planning of the USA against China, but also a trade agreement between these two, to improve agriculture in North America. [22]

Reed et al. (2019) propose a distinction between cyberbiosecurity and cyberbiosafety, implicitly a new terminology, cyberbiorisk management, and which refers to "identification, elimination and/or control of cyberbiosecurity vulnerabilities in the life science enterprise". Cyberbiosafety vulnerabilities include some of the followings: network-connected biological infrastructure systems (an unauthorized change may present risks of environmental contamination or could endanger human, animal or plant health) or the manipulation of digital genetic sequences (exposure to hazardous pathogens, environmental contamination). [30]

3.3.1. Examples of risks and/or vulnerabilities associated with cyberbiosecurity:

Nowadays we discuss about modern biotechnology (and possibilities to design living organisms with new or enhanced functions, modifying the DNA or even synthesizing new organisms), but also about laboratories of the future - LotF (led by virtual assistants, with automated techniques, artificial intelligence, complex neural networks, virtual reality, cloud computing and blockchain). Even so, with all these new scientific advancements, it is necessary to remember some important names that brought a significant contribution to the early developments of biotechnology: the agronomist Karl Ereky, considered the father of biotechnology, Edward Jenner, the English doctor who helped to the recognition of the vaccination importance (due to smallpox vaccine testing experiments), Alexander Fleming, the Scottish bacteriologist who discovered penicillin, Louis Pasteur, the French microbiologist who is linked to the discovery of brewer's yeast fermentation and many others. [7, 18, 30] We are the witnesses of a rapid growing evolution of biotechnological research, which has enormously evolved since then, and some common examples are: insulin production by recombinant DNA technique, human genome sequencing, genetic editing through the tool of synthetic biology, CRISPR/Cas9 (with benefits in the treatment of genetic diseases, HIV/AIDS, anti-cancer treatments), genomic synthesis (nowadays, it can be performed in just a few weeks, comparative with

some years ago, when the poliovirus genome was synthesized in 3 years) etc. [18]. With all these scientific developments and an increasing venture capital investments in biotechnology and artificial intelligence R&D (e.g. in 2016, the synthetic biology industry received USD 1 billion, and the AI, USD 5 billion), new issues arise, those of double uses of research and, the risk of cyber attacks (i.e. in the medical and pharmaceutical field), and given that digital dependence of research laboratories in which biological (-omics) data is managed, is increasing. [5, 7, 21] Typically, biological risks have been managed by implementing standard biosecurity practices, identifying vulnerabilities and then mitigating the risks through policies, standards, trainings, and physical security. For example, dangerous pathogens and toxins have been regulated by their inclusion in the Biological Select Agents and Toxins (BSAT) list, and by the Biological Weapons Convention (BWC), which has the major objective to ban the development, production and storage of weapons derived from biological agents. The US and Russia are supposed to have smallpox strains in their BSL-4 laboratories, but given that a lot of genomes/genetic sequences are available online, and due to advances in genetic engineering (CRISP /Cas9 technology), new risks arise, mainly related to viral or bacterial genome editing (e.g. avian influenza virus - H7N9, with a mortality rate more than 40%, and which presently requires only 3 mutations to become more contagious and to rapidly spread to humans) or to new pathogens synthesis, which are not classified and regulated as potential threats. [7, 34]

Malicious actions on data flows (e.g. in biopharmaceutical production processes), unauthorized access to sensitive information (e.g. private biomedical data, technological information), data theft (intellectual property information, trade secrets, patients' private data, data belonging to forensic laboratories) and payments requests (ransomware attacks) are some of the most well-known risks in cyberspace. With the evolution of genomics, new plausible scenarios have emerged regarding cyber threats, including the insertion of a malicious code written into DNA (a malware encoded into a genetic molecule), which is intended to affect bioinformatics tools. [27] The production of genetic data has doubled every 7 months since 2010, and their digital availability increased exponentially, and this has led to an awareness of a potential threat of cyber attacks in various sectors of the life sciences. [3, 9] Genetic sequences manipulation is typically performed using CAD software, while cyber vulnerabilities are introduced into a genetic code using GenoCad (in a combination of PHP and JavaScript, and using an Apache server, usually). Common tools used for online genomic data screening and to download data sets, are the Galaxy application, and the PostgreSQL database. [27, 28]

With the evolutions of new genetic techniques, actions such as file encryption with the intention of payments receiving (ransomware attacks), industrial hacking, corporate espionage, commercial sabotage, are joining the other new challenges that expand the landscape of cyber risks, such as dual use of research and designing new potentially dangerous infectious agents. [10, 26] In 2014-2015, FBI reported a 53% increase involving industrial espionage incidents in the US, and a 10% increase for cybersecurity incidents involving the medical field, from the beginning of 2010. In 2017, 18% of cyber incidents targeted hospital IT systems (especially those of the

private healthcare systems) and they were classified as ransomware attacks for critical data retrieval. [38] In 2014, a hacking attack, known as Anthem Blue Cross, affected 4.5 million patient records. [21] In the UK, another ransomware attack, known as WannaCry, targeted the same sector. In 2017, the chemical and pharmaceutical Merck company's network, suffered from the cyberattack known as NotPeya (the most expensive in history, with a global damage estimated at over USD 10 billion), which targeted the production control system and affected both, the company's international business operations (lost sales of USD 135 millions and other additional costs of USD 175 millions, and a total of USD 1 billion in one year) and the production of the Garadasil vaccine (IUU), Human Papillomavirus Vaccine. Another malware has targeted the biopharmaceutical field, and which is believed to be used also for sabotage, known as Dragonfly. After these events, the pharmaceutical industry could be considered as an attractive target for cyberattacks. To support the medical system, cybersecurity experts and scientists were invited to a joint online dialogue, through the Biohacking Village initiative (https://www.villageb.io/). Also, in 2019, the US Department of Health and Human Services (HHS) announced the opening of the Health Sector Cybersecurity Coordination Center (HC3). [11, 25, 31]

Therefore, cyber vulnerabilities associated with networked biological data systems and, consequently, the associated infrastructure and equipments, R&D laboratories become subject to malicious exploitation, with cybersecurity risks and potential impact on both, bioeconomy and health. [25] Scientific progress and new genomic approaches in the life sciences also lead to new vulnerabilities and security risks in the management of genetic data. This information is particularly relevant not only for R&D and industry, but also for the public health, food and agriculture, and environment. However, even if cybersecurity focuses mainly on ensuring the confidentiality, availability and integrity of digital data, there are no systemic studies to include the emergence of biological cyber threats, especially in terms of security breaches involving genetic databases. To date, as far as is known, no cyberattacks have been reported on these databases, probably because the motivation for biohacking is weaker than that for attacks which target personal data, and in addition, the number of users of genomic data is much smaller. [31] However, with the expansion of the genomic databases, which have become an integral part of biological and biomedical research, and with an increased funding for the field of experimental genomics, as well as the free accessibility of digital genetic information to anonymous users, a new concern arises for cybersecurity, in particular for the identification and monitoring of genetic sequencing operations involving pathogens that may present risks of malicious use, and which requires dedicated research and systematic studies on the protection of biological data against cyber attacks. [38]

In 2018, 1737 databases with information on molecular biology were reported, and publicly accessible, of which 30 were dedicated to genomic information for viruses, 71 for prokaryotes and 35 for fungi, with applicability mostly in pathogens research. The most well-known genomic databases are hosted by NCBI (National Center for Biotechnology Information) and EMBL (European Molecular Biology Laboratory). NCBI stores 180914 bacterial associated genetic

data, 4055 fungal specific data and 23816 viral specific data (e.g. genes, genomes, nucleotides, proteins), and also hosts many other smaller genetic databases, such as SRA (with "raw" genetic sequences resulting mainly from projects research), RefSeq (for genetic annotations), GEO (genomic data on gene expression regulation), BLAST (nucleotide sequences, proteins). EMBL, similar to the GenBank database (which contained approximately 20% of bacterial genomic sequences in August 2017), holds mainly genetic data corresponding to pathogens from several databases, such as EnsemblGenomes, EnsemblBacteria (with 44048 bacterial genomes), EnsemblFungi (811 fungal genomes), Array Express (transcriptomic data, RNA-seq, DNA-seq, CHIP-seq). Biomart is commonly used as an interface for accessing EMBL data, but alternatively REST, MySQL, APL PERL, API R can also be used, the molecular sequences being stored in FASTA or FASTQ formats, and some are binary data (those recorded in SRA). Other genomic databases are: JGI (hosted by the Joint Genome Institute), which stores integrated comparative data (for genomics and metagenomics research), MycoCosm (fungal associated genomic data), GOLD (genomic metadata resulting from research projects), PATRIC (it holds 202602 bacterial genomes and other several thousand for different species of Archaea and bacteriophages), EuPathDB (genomes associated with eukaryotic pathogens, but also of non-pathogenic related species or host organisms), ViPR (viral specific genomic data required in phylogenetic and comparative analyzes, or for genomic annotations), PHIbase (for the study of host-pathogen interactions), PAMDB and PhytoPath (genomic data associated with phytopathogens), GenomeTrakr (FDA-managed network for monitoring food pathogens; it holds associated data for more than 2000 microorganisms with potential risks, but also common clinical pathogens). [38]

4. Conclusions

In this paper, the author has aimed to highlight the new concept of cyberbiosecurity and to synthesize some of the main aspects related to the life sciences and cyber space convergence, which have led to a new emergent multidisciplinary field. Cyber and biological contributions to bioeconomy, health, and environment reshape the security landscape. We are witnessing times of new industrial trends due to the present biorevolution, which is based not only on biotechnological scientific progress, but also on network connections, digital DNA and enhanced competitiveness. Business interest moved forward to modern biotechnology field. Smart laboratories include networked systems and devices, international interconnections, and artificial intelligence. All of the above generate opportunities, but also vulnerabilities and risks. Experts in cybersecurity issues recognize the biological implications, and they are starting to work with biotechnologists or other scientific experts, in order to promote a common language, definitions and knowledge, to better understand the new field, to identify security gaps, to foster awareness about cyberbiological threats and to develop strategies and countermeasures. Furthermore, a call for action is launched among policy makers, academia, industry and various stakeholders to design principles, standards

and policies, to mitigate the cyber attacks and other related biosecurity issues (e.g. dual use research, combinational weapons), having in mind to strengthen the safeguarding capacities to protect human, animal and plant health, and business interests. [10, 24]

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The effect of adding corporate environmental reports in the annual financial reports on corporate governance and sustainable development of companies in Jordan

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Abstract

During the last two decades of the last century, the pressures demanding companies to take responsibility for all stakeholders increased, and they demanded to disclose the effects of operations they carry out on the environment, employees, and society, and these pressures were in two directions, first being internal to adopt technologies aimed at reducing waste costs which improving the image of the company locally and globally, that will classify it as a (green company), and on the other hand pressures it was external by increasing the environmental audit process, this led companies to think seriously about improving their environmental and economic performance to preserve the environment, and then support sustainable development.

The definition of sustainability has become widespread and can be applied locally and globally level, and over different periods and this requires a massive team effort. Also, sustainable development takes multiple patterns, starting with reorganization of living conditions (such as environmental villages, environmental towns, and sustainable cities), reassessment of

economic sectors (perennial agriculture, green buildings, and sustainable agriculture), or business practices (sustainable architecture), and that Using of science to develop new technology (environmental technology, renewable energy), with modifications to individual lifestyles that conserve natural resources. Achieving sustainable development requires reconciling social, environmental, and economic demands, which are the "three pillars" of sustainability (Social, environmental, and economic demands).

This paper aims to review the impact of adding environmental Corporate Reports with the Annual Financial Reports on Corporate Governance and Sustainable Development in Jordanian companies and a reflection of this on the obligations of companies to achieve sustainable development and its corporate governance.

We expected that we would find weak interest from various companies in environmental reports which effect on achieving sustainable development, with greater attention to the economic aspects because they are reflected in the financial capacity of companies, and increase their revenues and continuity, but the Jordanian government continues to pressure companies by adopting many laws to include environmental reports of companies as an appendix with annual financial reports of Jordanian companies.

Keywords: *corporate culture, environmental accounts and accounting, auditing, government policy.*

Jel: *M14, Q56, M42, Q58*

1. Introduction

The issues of the sustainable environment became prominent and important around the world due to its close relationship to the welfare and development of society, which led to an increase in the need to provide environmental information in a financial way through the accounting branches like environment accounting and national income Sustainable. Therefore, it is necessary to have a conceptual accounting framework in line with the requirements of preserving the environment and supporting sustainable development.

The term sustainability has become widespread from the local level to the global level, because of globalization and increase in the population of the earth, and the increasing demand for natural resources, which has negatively affected both humans and other living systems, and there is much evidence that humanity lives in an unsustainable manner, and this requires reuse Natural resources to maintain sustainability through collective local and international efforts that take many forms starting with the reorganization of living conditions (such as, environmental villages, environmental towns, and sustainable cities), reassessment of economic sectors (perennial agriculture, green buildings, and sustainable agriculture), or business practices (Sustainable architecture), using science to develop new technologies (environmental technology, renewable energy), adjusting individual lifestyles and preserving natural resources. For many environmentalists, the idea of

sustainable development is an appropriate way to stop environmental degradation. Different systems are linked together with the ecosystem, so any gain in one sector is a loss from another sector.

Industrial companies are the largest contributor to pollution and the elimination of many natural resources. Therefore, calls for attention to environmental issues increased, and pressures demanding companies to take responsibility for all of them increased. These pressures were in two directions. The first is internal to adopt technologies aimed at reducing waste costs and waste and improving the corporate image. Locally and internationally, and classifying them as a (green company). As for the other direction of pressure, it was external through increasing the environmental audit process, which led companies to think seriously about improving their environmental and economic performance to preserve the environment and then support sustainable development.

Because of the importance of the environment and development, the United Nations held its conference on development and the environment in 1992 [1]. Following this conference, most countries adopted sustainable development as a national goal, and companies attempted to achieve this goal by adopting several principles such as sustainable business or institutional responsibility, sustainable accounting, and that is why companies, first companies have the attention to the environmental issue was Canadian companies, began to disclose an annual report on sustainable development, convinced that this would increase the value of their shares. In September 2015, the United Nations General Assembly unanimously adopted a new sustainable development agenda [2]. The agenda includes 17 sustainable development goals (SDGs) and 169 associated targets, which most UN member states have committed to implement by 2030. An important feature of the agenda is the clear recognition that social and economic development does depend on the sustainable management of the natural environment and its resources.

In Jordan, the inclusion of sustainable development elements in the financial reports began in 2010. Some institutions, such as the Arab Bank, Jordan Kuwait Bank, and Nuqul Group, were the first to include these elements in their financial reports. In (2010) the Arab Bank issued the first annual sustainability report as a summary of the performance and activities of the bank in the social, environmental and economic fields, making it the first bank in Jordan to issue a report within the Global Reporting Principles (GRI) (Arab Bank Sustainability Report, 2011).

As sustainable development emerged as the solution to the complex social and environmental issues that must be addressed through accounting practices as sound environmental accounting practices are an important issue for sustainable development with a focus on environmental taxes, environmental costs, assessment of ecosystem services, the cost of carbon dioxide, and the cost of water pollution Ensuring sustainable income for green products as a path to sustainable development.

First: The research problem

The current information that accounting provides to society in its annual financial statements is no longer sufficient for disclosure and support for sustainable development. This requires accountants to build a comprehensive accounting

framework that is reflected through the application of financial standards to prepare auditor's disclosure of what is achieved through the results achieved by Environmental accounting which help the management of the company rationalizing decisions that affect the economy and society.

The research problem will be done through the following questions:

1. What is the relationship between sustainable development and different accounting branches like environmental accounting and how do companies disclose this in their financial statements?

2. How do companies measure their success in environmental issues by applying financial standards and the impact of disclosing their contributions to the environment to achieving sustainable development?

3. Is there a role for disclosing environmental reports and the application of financial standards in achieving sustainable development for companies, the economy, and society?

Second: Research objective

The research aims to answer previous questions in addition to the role-played by the application of international financial standards and their impact on disclosure through changes in accounting branches such as cost accounting and administrative accounting, natural resource accounting, financial accounting, national income accounting and its role in the disclosure of financial statements, then in the and environmental reports.

The current research attempts to define the role of the implementation of the IFRS for financial reports and disclosure of environmental reports on supporting sustainable development in Jordan.

Third: The importance of research

The importance of research can be determined as follows:

1. The research deals with the topic of sustainable development as a contemporary concept that affects companies with a focus on the benefit of the environmental reports on sustainable development of companies to reach their goals.

2. Expanding the field of use of environmental accounting to include all economic sectors which help companies to improve and develop.

3. The importance of the role the environmental reports play in support sustainable development.

Fourth: Research Methodology

To achieve the research objectives, we followed the descriptive approach based on books, magazines, letters, Arab and foreign research, and the Internet.

Previous studies:

1. Matar and Al-Suwaiti study, 2012 [3]

The study confirmed that sustainable accounting linked to imposing the continuity of companies being calls to meet the needs of interested parties or so expanding responsibilities companies to include attention to all these parties and focused on the three theories of accounting sustainability (economic, social and environmental) it proposed a conceptual framework for sustainable accounting

includes the issue of reports on economic performance, social and environmental indicators from which manpower and human rights emerge so that the concept of societal unity is replaced instead of the concept of accounting unit.

2. Al-Shaabani and Nasser study, 2012 [4]

The study aimed to research the sustainability of the development process from its absence, and that there are detailed accounts with appropriate environmental information that are disclosed to create a strategic vision for the sustainable development process, while there are no sustainable reported in the annual financial statements.

3. [5] Mehenna & Vernon study, 2002

The study reviewed the stages of establishing environmental accounting, the statement of environmental costs, environmental management accounting, and environmental policies and their role in standardizing work plans, and recommended developing and encouraging environmental ethics, and developing a sense of self-responsibility while using the environment.

4. Ginoglou & Tahinakis study, 2003 [6]

The study aimed to expand the field of financial accounting to include elements of natural resources with a study of the interactions between economic and environmental sectors to provide a better measure of performance, economic growth, and more comprehensive evaluation.

5. Laurinkeviciute et al. study, 2007 [7]

The study aimed to identify the main problems of the performance of environmental management accounting, it was found that the amount of environmental costs is increasing by (850%) per year due to the use of traditional cost accounting, especially the cost of capital.

6. [8] Deegan claims in 2002, that institutions should provide accounts not only for their financial performance but also for their social and environmental performance. It also highlights the apparent absurdity in using market-based mechanisms, such as cap and trade systems for pollutants, to effectively solve social and environmental problems caused by the market. He questions the role of accounting and business teachers in instilling a form of personal social responsibility in the minds of students.

In 2013, Deegan [9] [10] struggled to improve the concept of traditional cash reporting frameworks and tried to effectively solve social and environmental problems caused by markets. And the role of the accounting profession in contributing to accountability companies on a large scale.

7. Kuasirikun study, 2005 [11], revealed through his research:

Accountants are interested in maximizing profit, welfare, and societal economics, as the traditional economic aspect of the business remains the main goal, then moving to the foundations of preparing accounting information reports, the result of which appears to be provided for financial purposes, with the transition to that the accounting information has been prepared for oversight Administrative and decision-making.

So the expansion around accounting importance is the first step towards a broader vision of business responsibility and accounting and disclosure and an

exploration of how companies perceive broader social responsibility in the future along the lines of their traditional financial vision, As a result, companies are responsible for the non-financial performance, so companies must be responsible for societal problems and for the negative consequences they generate for society, such as consumers, workers, and the physical environment, some see accounting have a relationship with corporate social responsibility and environment , and companies responsible towards society in general, so accounting reports which supports company's commercial activities the extent of their interest in society, so some of them suggested that the company must have other non financial reports contribute of determining the degree of its contribution to society.

8. In 2010 Jones [12] developed a theoretical, multi-layered model to support and report environmental accounting that was a severe environmental risk. So determining the implications of accepting this theoretical model for organizations and accountants which contains:

First, on a public level, given the seriousness of environmental problems, it may seem wise for managers and accountants to take immediate action to address these threats.

Second, the traditional accounting model, with its narrow focus on accounting numbers, does not reflect the environmental consequences of organizational activity.

Third, as part of innovation and experimentation, there is an ongoing need to explore potential alternative monetary and non-monetary systems.

Finally, the theoretical framework indicates that as part of the discharge of its supervisory function, organizations must disclose their environmental performance to stakeholders.

9. Khaled and other's study, 2012 [13], studied the level of application of Environmental Management Accounting (EMA) in companies within environmentally sensitive industries and found that elements of environmental management accounting in some organizations in which the interviews were conducted were driven by cost-saving rather than environmental protection. Without consideration that the companies 'actions towards environmental issues stem from pressures from customers who request procedures and processes that not harm the environment where companies work.

10. [14] Al-Hayali study, 2009: The study attempted to determine the mechanism for calculating the penalties paid by companies as a result of not using the pollution reduction equipment and trying to evolve the disclosure of environmental effects and their impact on the financial statements prepared by those companies, and the recommended information on environmental damage and costs, reduce pollution.

11. Agha study, 2011 [15]: The study highlighted the complementary between the requirements of environmental comprehensive quality management and the requirements of the management of pollution types as a tool to reduce all green supply chain to enhance the sustainable development resulting from production processes, with identifying the strengths of these experiences to developing realistic proposals for how to adapt and benefit from them.

12. In 1992 Bartelmus [16] analyzed accountability for social and economic policies for environmental impacts at sustainable development. Integrated economic and environmental accounting evaluates certain aspects of the sustainability of economic growth in terms of preserving and maintaining productive capital, so the comprehensive development analysis includes more non-economic goals that are not suitable for critical evaluation in addition to social evaluation of these goals through the rules, standards, and objectives required for integrated development as he again in 2013 [17], described the concepts and methods of environmental accounting at the national level and the role of Energy in Accounting and Sustainability Analysis.

13. Dietz and Neumayer study (2007) [18], explained the latest International Environmental Accounting Manual, Integrated Environmental and Economic Accounting System or SEEA (United Nations, European Commission, International Monetary Fund, Organization for Economic Co-operation and Development and the World Bank) National Accounting Manual can be used to measure weak sustainability And strong, with the importance of understanding the conceptual differences between weak and strong sustainability, then outline that it is current best practice in measurement, as it is reported by the Integrated Environmental and Economic Accounting system.

14. In 1997 El Serafy [19] tried to record all environmental changes and national accounts that are more environmentally beneficial. He argued that green accounting can only guarantee income sustainability and should be considered a step that ultimately leads to ecological sustainability.

Through a review of previous studies, it is shown that:

1. All previous studies are consistent with the current study in that it all researches the relationship between environmental accounting, disclosures, and sustainable development, although each study examined this relationship from a particular aspect.

2. This study is an extension of the previous studies, but what distinguishes it:

A. The study reviewed two important concepts, the role of disclosure in the financial statements when applying IFRS and The role of disclosure of non-financial reports like environmental reports support the sustainable development of the company to reach their goals.

B. It addressed the topic of the role of accounting branches in achieving sustainable development such as cost accounting and administrative accounting, natural resource accounting, environmental accounting, and disclosure, on support companies financial and non-financial reports.

The Sustainable development

Sustainable development aims to control the use of available resources for the growing needs of the human factor, and thus preserve the opportunity to use these resources for the next generation [20]. To achieve this goal, environmental issues must be integrated into institutions in the manner that obligates them to consider issues Environmental level at the accounting, legal, financial, and technical levels [21]. As the funds allocated to production are specified and linked with environmental control through environmental laws and violating them have high

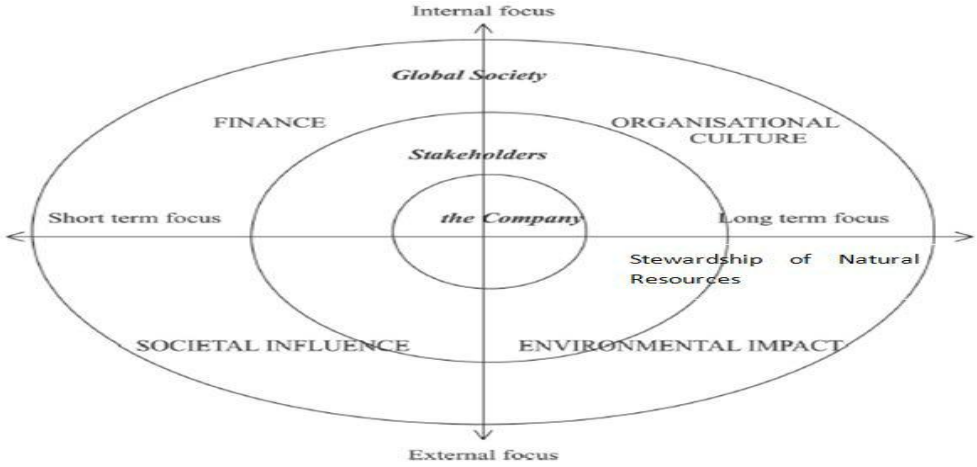
costs at the production level and companies can't afford this increase in costs that mean reduce its usual production and thus reduce the consumption of natural resources due to the cost of implementing environmental laws. The Accounting Department determines that costs and reveals it separately in the non-financial reports.

Corporate finance depends on its financial statements, and environmental and social reports are not one of these rules. Therefore, sustainable development of business will remain marginal if not attention there is of increasing environmental and social responsibility, but political decisions still maintain old models of corporate governance that are not based on the basic principles of corporate social responsibility and accountability [22].

The definitions and applications of sustainable development differ according to the type of company and the field in which works [23], and these areas are the state, market, and civil society [24], but a new change has occurred in the contemporary role of business in society (and in the environment) so research has emerged related to corporate social responsibility that has become a "potential catalyst for the results of changes in governance arrangements" [25].

Corporate sustainability reporting needs to be further compared to non-financial disclosure by firms and society as a whole. If sustainability reports increased disclosure; the accountability and transparency for companies are growing rapidly and taking more and more acceptance of traditional practices [26]. The relationship between transparent corporate governance and sustainability by companies is traditionally known as corporate social and environmental responsibility reports, and it linked with the success of the financial performance for companies.

The preparing of sustainability reporting framework need cooperation with business, investors, civil society, business, NGOs, accountants, and other parties to make non-financial reports routine and comparable to the financial reports of all organizations [27] so many large and multinationals have begun move seriously to do this point.



A model of sustainable development, polarizing internal versus external focus and short term versus long term focus of the firm

Definition of sustainable development

Sustainable development is a development that meets the needs of the present without affecting the ability of future generations to meet their own needs. So the idea of sustainability calls for improving the quality of life for all people in the world without increasing the use of our natural resources. So sustainable development combines environmental, social, and economic concerns, and provides business opportunities for companies to improve the lives of people in the world.

The issue of sustainable development has increased since its submission in the Brundtland Report in 1987 as sustainability was defined for the first time as development that meets the needs of the present without including the ability of future generations to meet their own needs [28] and the Rio Conference defined sustainable development as "the right to development" To achieve an equal balance between the development and environmental needs of current and future generations" [1]. The World Commission on Environment and Development also identified sustainable development as "development that allows meeting the needs and requirements of the current generation without compromising the ability of future generations to meet their needs [29]. As the United Nations Environment and Development Commission defined on 20 March 1987: "Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs." [28]. Under IFAC, sustainable development is defined as the management of environmental and economic performance by creating and developing systems of sustainable accounting. Having one universally accepted definition of sustainability is difficult because of the many things expected of it, so there is a simple definition of sustainability, as "improving the quality of human life when we live within the absorptive capacity of the supporting ecosystems"

Corporate governance for sustainability

The interest in environmental performance started since the seventies by the American Accounting Association (AAA), where a special committee was formed to study the environmental performance and study all the obstacles that are being applied with setting policies and environmental goals in the light of the laws and regulations and the legislation, so accountants to adopt the principle of prevention of pollution and reduce sources, and in the nineties, held many of the Conference Art and seminars such as the Washington Conference in 1992 and the Geneva Conference in 1991, as many have from professional associations and organizations put a lot of international standards that address issues related to accounting of environmental, such as the international standard (FAS -S) Issued by the Financial Accounting Standards Committee (FASB) cooperation with a Special Committee (AICPA) and SOP-96-1 on Environmental Obligations and Disclosure.

Table 1. Contributions of accounting societies and institutes to care for the environment:

No.	The association or institute		Contribution or recommendation
1	Canadian Institute For Certified Public Accountants	CICPA	Increasing disclosure of environmental issues empowers users and the public. The shareholders will assess the environmental performance of the company.
2	Association of English Certified Accountants	AECA	The environmental reporting framework was provided to disclose the accounting methods used in the assessment of contingent liabilities and the assessment of environmental assets and their disposal methods as well as the expected future costs.
3	Financial Accounting Standards Board	FASB	Issuing the principle of accounting for contingent possibilities to arrive at an estimate reasonable amount of the environmental loss and the disclosure of contingent liabilities.
4	American Institute For Certified Public Accountants	AICPA	Issuing an accounting guide related to the accompanying environmental liabilities Environmental pollution and corruption.
5	Securities Exchange Commission	SEC	Issued guidelines related to disclosure and measurement of environmental liabilities with a view to Providing information that helps users of financial statements in making decisions.
6	Environmental Protection Agency	EPA	The agency undertook monitoring of hazardous waste when it moved from the cradle to the grave, as well as issuing various reports on pollution and corruption Environmental.

The Rio + 20 Institutional Sustainability Forums in June 2012 (Earth Summit) was promoted as the first global UN conference on sustainable development as world leaders agreed to develop a plan of action for achieving that development in the third millennium, including a programmatic integrated approach at the global, country and local levels, where the green industry platform was fully endorsed: as an "initiative to mainstream environmental and social considerations into corporate operations" [30].

Accordingly, the accounting professional groups began, since the 1990s, to take an interest in sustainability accounting, and the British Society of Certified Public Accountants (ACCA) was the first to issue much information about the data in the other reports, noting that the information in the financial report is not the same as the information published on other reports which called the Sustainability Report, the Environmental Social Report, or the Social Responsibility Report.

At the beginning of the third millennium, there was greater interest in developing comprehensive strategies to protect human health, avoid the occurrence of waste and rationalize the exploitation of natural resources with the conclusion of international or regional agreements to protect the environment, such as the United Nations Convention on Climate Change which linked with the concept of sustainable development and sustainable accounting.

Accountants play a major role in environmental issues, "through their traditional roles in recording and reporting financial details and through their roles as business managers". But how will the accountant's jobs change as a result of environmental management issues that they will have to participate in. [31].

The role of the accountant depends on his responsibilities to determine the extent of adherence to the environmental standards of the organization and its interest in environmental issues and achieving sustainable development through:

1. Participate in environmental audits through the internal audit program,
2. Evaluating the investment proposals, taking into consideration the environmental benefits.
3. Analyzing waste and energy costs to encourage their reduction
4. Providing information to support environmental management [31].

The management accountants play an important role in contributes directly to planning and controlling organizational processes [32], and they play an important role in organizational decision-making processes [33]. Because the relationship between environmental and economic performance has increased, so the new roles for management accountants emerged as coordinators for decision-making, with new performance measures and analysis tools, and finally issued the environmental reports.

Wilmshurst and Frost (2001) [34] note that "sustainability accounting can include accounting mechanisms that deal with environmental impact assessment, environmental performance assessment, financial information flow, and monitoring the success of the implementation of environment-related measures". And that the role of the accountant can be considered as two-dimensional:

1. Participate in the company's internal operations, focusing on performance and compliance concerns, and
2. In the external dimension related to the disclosure of economic information to users of external reports.

Accountants and those responsible for the environment work together to encourage sustainable development initiatives within companies, so accountants must use sustainable development accounting or green accounting, which deals with the problem of environmental pollution and provide managers with full information related to this problem is to guide them in determining what needs to be done to preserve the environment, as well as for creation and development of systems of accounting appropriate concerning the environment and applications, and the availability of information that helps companies In preparing strategic plans [35].

If the organization is unable to justify the continuation of its work, the society will cancel its contract with the organization, so it can't continue its operations so that consumers reduce or cancel demand of products, cancel the supply of labor and financial capital for companies or press the government to increase fines, taxes or laws to prohibit those actions are not in line with societal expectations [36].

Deegan (2002) [8] says: "Organizations depend on community resources to produce goods, services, and then produce waste which affects on the environment. And to allow the organization to exist, society expects the benefits of a company to

outweigh its disadvantages and legitimacy is a resource for the organization's survival" [37].

We must focus on the need to link three main elements of sustainable development (economic growth, environmental quality, social justice) [38]. Also, sustainable development has three dimensions: 1- economic viability, 2- social responsibility, and 3- environmental responsibility [39].

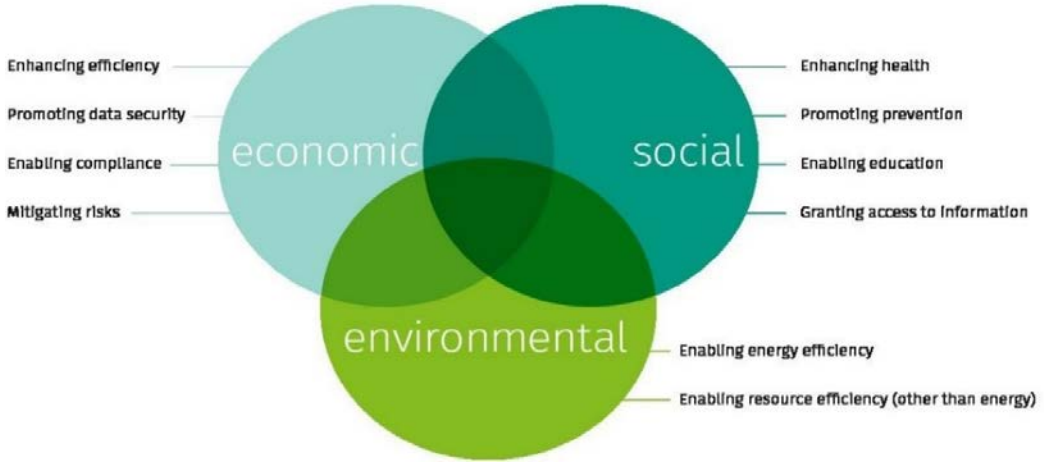


Fig. 2. The sustainable community (Elgizawy, 2014)

So sustainable development is the development of a three-dimensional interconnected, integrated and overlapping focuses on the side of economic as well as its focus on environmental and social aspects and requires the need to make changes boss in society and sustainable development based on the reality of money which includes all data and reflect all contents of these components.

The concept of capital is divided into five types:

1. Financial capital: It refers to money, stocks, and bonds.
2. Human Capital: It refers to the health and educational capabilities of the workforce.
3. Social Capital: Includes the prevailing social culture with all its values and customs.
4. Natural Capital: It means natural resources and ecosystems (water, air, and soil).
5. Productive capital: Includes physical assets capable of producing goods and services [40] and that reflects on Requirements, importance, and dimensions of sustainable development

Achieving sustainable development requires a set of systems that must be embodied in the realities of human life, which can be identified as follows:

1. An economic system through which it can create productive surpluses based on self-reliance and sustainability.
2. A productive, administrative, and international system in which sustainable trade and financing patterns are taken into account.
3. A social system that provides solutions for development and makes possible proposals for the sustainability and increase of gender participation activities.
4. A political system that ensures the active participation of citizens in the decision-making process and various levels of life and administrative and social activities. [35].

Became the companies to bear additional costs by the policy of polluter pays for legal responsibility, social, and environmental, and that this policy will result in short-term increases the cost of production and makes the process of producing harmful products to the environment difficult and possible impact on product prices and competitive strength and market share of the company and then influence the growth and profitability of companies.

But as Elkington (2004) [39] points out, even the greenest companies begin to change as success progresses and they are forced to face market realities to coordinate the company's aspirations and the multiple prescriptions for the inputs that make up the production system.

For organizations operating in several countries, the environmental, social, and environmental impacts do not recognize borders, and limits of impacts may be local, regional, or global. International companies try to meet the consumer's needs for goods and services and thus the consumer is primarily responsible for all effects of the economic system in the sense of meeting the needs of the end-user, which is the driving force and responsible of most economic, social and environmental impacts [41].

The Sustainable development and accounting:

Sustainability accounting plays a key role in developing and reporting, so sustainability accounting and reporting of corporate contributions to sustainable development are emerging issues in corporate accounting, and it has important tasks of sustainability accounting is to integrate all dimensions of sustainability: economic, environmental, and social.

Accounting for sustainable development is an approach to organizational accounts that include social and environmental issues. Therefore, multiple accounts of sustainable development emerged and part of them is environmental accounting which was itself an extension of work in social accounting. [42](

In Jordan, there is a positive relationship between sustainable accounting and support for sustainable development in the Jordanian industrial sector, with a consensus that implementing sustainable development allows developers to meet the needs and desires of current and future generations, but the relevant legislation is not sufficient to enable the preservation of the environment, and there is little environmental information disclosed in the financial statements, because the environmental response by companies is limited only to the legislation enacted by government agencies to avoid any expected sanctions.

Definition of sustainable accounting:

Sustainability accounting is the generation, analysis, and use of environmental and socially relevant information to improve the environmental, social, and economic performance of companies, it includes linking sustainability initiatives to entity strategy, assessing risks and opportunities, and providing measurement, accounting, and performance management skills to ensure that sustainability is incorporated into the day-to-day operations of the facility.

The goal of sustainable accounting:

Sustainability accounting aims is to assess the environmental and social performance and corporate governance by calculating its management of various forms of non-financial capital related to environmental, human, and social sustainability issues and corporate governance issues, on which companies rely for their long-term sustainability and value creation.

On other words disclosure and develops an integrated business strategy for corporate governance and to assess sustainability risks and opportunities inherent in investment decisions. So it's a supplement to financial accounting so that financial information and sustainability information can be evaluated side by side and provides an integrated vision of the company's performance and the creation of financial and non-financial value across all forms of capital.

History of sustainable accounting:

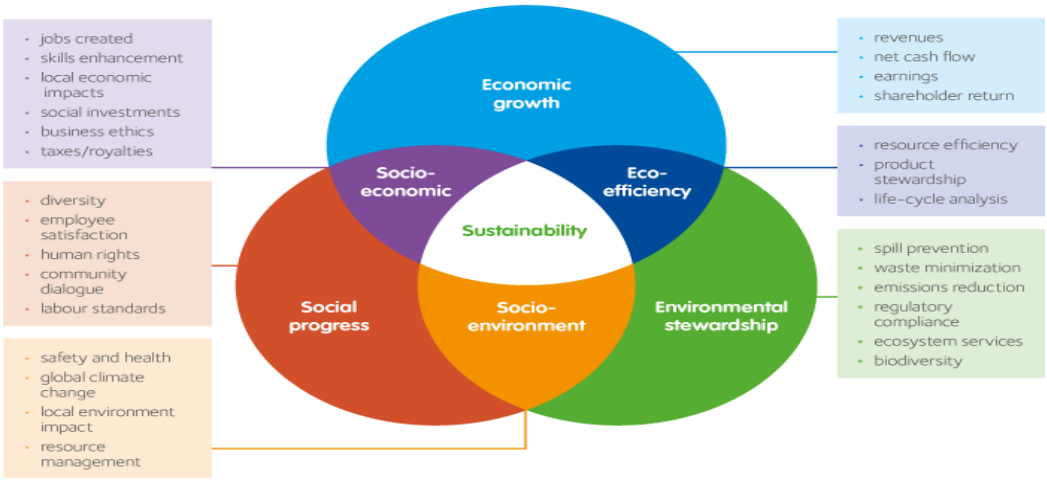
The first appearance of sustainable development was during a conference organized by the United Nations in Stockholm in 1972 to discuss the human environment, where it was discussed and directed to cover environmental issues and their relationship to poverty and the absence of development that is considered the largest enemy of the environment, PF Shell Duch (Royal) was the first company It issued its sustainability report in 1997 so that the first page of the sustainability report issued in 2009 began with the phrase “How do we fulfill our obligations towards sustainable development?”

Table 2. History of sustainable accounting

Period	Action and Procedures
1971-1980	Many papers were published indicating the construction of models that enhance social accounting disclosures but have suffered from problems in analysis as well as Social and Environmental Accounting Literature (SEAL)
1981-1990	The period witnessed an increasing complexity within the field of social accounting with a clear shift in interest in environmental accounting. The concerns of social disclosure were replaced by a focus on environmental disclosure and regulation as an alternative way to reduce environmental damage
1991-1995	This period was marked by almost complete control, with the transition from environmental disclosures to environmental audits, along with the development of a framework to guide environmental auditing applications, especially the development of environmental management systems.
1995 - Present	The convergence of global capital markets and the emergence of global and regional quality control issues, the accounting literature showed a significant increase in interest in sustainable development and accounting issues, In addition to a growing set of metrics on accounting for sustainable development in many international and national contexts plus international policy bodies.

The areas and functions of sustainability accounting are:

1. Economic growth
2. Environmental efficiency
3. Socioeconomic
4. Social progress
5. The social environment
6. Environmental supervision



Benefits of sustainable accounting:

Sustainable accounting provides useful data to reach the goals of reducing the negative impact on the environment and providing information about the prices necessary to estimate the monetary impact of initiatives such as:

1. Prevent pollution;
2. Designing preparation and improving inexperienced accounting;
3. Projection, costs, and life cycle estimation within the environment.
4. Managing product circulation from an environmental perspective.
5. Method of supply from an environmental perspective.
6. The responsibility of the product or product;
7. Enhance the company's image, reputation, and customer loyalty to achieve a competitive advantage.

Disadvantages of sustainable accounting:

The application of sustainable accounting is not a guarantee of obtaining cash or environmental performance. There are also some obstacles to sustainable accounting, namely:

1. The comparability challenge involves how to properly assess and measure the value of the environmental and social activities of the company.
2. High costs for staff training costs and it can't be done by financial accountants.
3. It is not possible to compare two companies or two countries if the accounting method different.

4. Increase the cost and time for gathering information, organizing, and developing the report.
5. Discomfort with increased transparency.
6. It focused on the internal cost for the company and excludes the cost to society.

How is environmental management accounting estimated? :

1. Determine the effects to be included
2. Environmental Impact Assessment
3. Estimate the cost of environmental sustainability
4. Environmentally sustainable profit

Environmental management accounting is used mainly to confirm the costs of environmental protection and its other indicators such as raw materials, waste generation and storage, and pollution, but it does not show the value borne by society.

Environmental costs include the internal and external costs associated with the environment and protecting it, include the costs required to prevent, store, plan, monitor and bear activities to repair the damages that may be incurred by the industrial company for the government, local public administration or society as a whole.

Environmental protection expenditures include all expenditures required to cover environmental protection measures taken by the economic entity relating to the environment, impact, and risks, and their production, control, registration, and cases of environmental storage, treatment, or reconstruction.

To determine costs in environmental accounting as follows:

1. direct material and labor,
2. indirect production expenses,
3. distribution costs,
4. general costs for management,
5. research and development costs,
6. environmental accounting to identify hidden costs, or improperly allocate them due to traditional methods, to evaluate them, and report them.

Accounting branches and related to environmental management accounting:

The most important branches of accounting affected by environmental management accounting**:**

First: National Income Accounting: Criticism of the macroeconomic indicators used in the national account's system has increased, and several weaknesses have emerged, including:

1. It cannot show the level of well-being by GDP without there is being a real improvement in well-being.
2. It ignores the regression of environmental assets.

Second: Cost Accounting: The neglect of conventional accounts of the costs of ecosystems has resulted in the profits realized will appear more than their real value. But depletion and the waste generated by the production process require high costs to reduce or stop emissions of harmful substances that companies incur for the

compliance of, and standards governing environmental laws, including costs of controlling.

We summarize that cost accounting contributes to supporting the environmental management accounting through:

1. The cost of maintaining and protecting the environment is included in the cost of production.
2. Developing the cost system to include the financial and economic aspects of the performance of environmental costs, and a statement of its impact on production costs and selling prices.
3. The company carries the costs of preventing or avoiding environmental damages at present or in the future.

The contemporary cost techniques have contributed including the comprehensive quality management and continuous improvement techniques of production produce good quality products to achieve customer satisfaction through obtaining goods or services of high quality at an affordable price**.**

Third: Natural Resource Accounting: it contributed by continuous reductions of waste of energy and natural resources by improving efficiency and changing depletion patterns that threaten biological diversity through the consumption of non-renewable natural resources in the amount that achieves development goals without prejudice to the needs of future generations**.**

Fourth: Management Accounting: Strategic management accounting techniques use to raise the efficiency of the company's use of different production factors through the ongoing use of monetary or physical units of measurement, and this model aims to achieve the monitoring and evaluation of performance. So Environmental management accounting contributes to supporting environmental protection through:-

1. Incorporating the environment into current and capital investment decisions.
2. The use of monetary and in-kind units in preparing environmental reports.
3. Rationalizing economic decisions related to assessing the company's fulfillment of its responsibility to protect the environment from pollution.

Fifth: Financial Accounting: The inclusion of the accounting system for environmental impacts and disclosure begins with an understanding of these effects and interaction between the environment and the activities of the organization, as the model of accounting for environmental performance requires an expansion in the accounting side of the accounting in terms of the accounting for companies:

1. The annual report is provided by the company's management to its shareholders.
2. Produce Environmental performance report in separate reports on the annual report.
3. The disclosure of environmental performance in an official record named the sustainable development records.
4. Disclosure of environmental performance through the Company's website [14].

Table 3.The application guidelines developed in the conceptual framework, consistent with the sustainability accounting

	Applied instructions	The development required to align with Sustainability Accounting
1	Accounting Entity	Substituting the concept of a community unit rather than an accounting unit, so the target user of the sustainability report will be represented by all groups in society rather than only in the category of owners.
2	Recognition and Measurement	Developing the concept of expenses to include the social and environmental impacts of corporate activity.
3	Principle Matching	Social and environmental expenditures and benefits must be taken into account in determining accounting profit.
4	Materiality	The development of this constraint and in a way that exceeds the quantitative measurement of the conventional indicators applied in assessing the relative importance, guided by the concept of risks associated with social and environmental impacts.

(Lehmon [43] , 2009 : 522-534*)*

Sixth: Environmental Management Accounting:

Environmental management accounting is the most advanced of sustainability accounting and has been increasingly addressed in the academic framework starting with Robert Gray's work in the early 1990s, by issuing guidelines for sustainability accounting in 2002. In recent years, there has been an increasing acceptance of new approaches to reporting; also experiences by organizations have also demonstrated a long-term view of sustainability aspects of accounting and reporting.

The Institutions are now required to calculate environmental costs and obligations and to disclose information about their environmental policies, environmental goals, and programs implemented in conjunction with associated costs incurred.

The elements of sustainable development are associated with a long strategy include the environmental dimensions in terms of costs and benefits, and this is in line with the "polluter pays" principle, which aims to include the environmental costs when calculating the cost of the product [44] and the adoption a polluter pays causes companies to bear additional costs arising from companies' non-compliance with environmental regulations issued; thus increasing costs, that pushing companies to reduce produce harmful to the environment, by produce competitive products to meet the desires and needs of the consumer without harm the environment .

Environmental management accounting can be defined as "the generation, analysis, and use of financial and non-financial information to improve the environmental and economic performance of companies" [45].

All environmental costs incurred arising cause for companies 'interaction with their internal and external environments. So we can be divided into two major categories

A) Internal Environmental Costs: the company bears these costs, such as repair and recovery costs, waste management costs, by companies 'compliance with environmental legislation. The internal environmental cost is divided into:

- Direct costs; Linked to a specific product, and pollution program, incurred by installing preventive technologies to reduce environmental damage.
- Indirect costs; can be assigned to cost centers such as environmental training costs and research and development costs.
- Emergency costs; it includes costs that may occur in the future; and their occurrence may affect corporate operations such as repair and cleaning costs

B) External Environmental Costs: These costs are passed on the community, such as environmental and health costs, and the cost of external environmental damage to the company; These costs can be estimated using economical methods to determine the maximum amount that community members want to pay to avoid damage [46].

Table 4. Environmental costs

External Environmental Cost	Direct or Indirect Environmental Costs	Contingent or Intangible Environmental Costs
Depletion of natural resources	Waste management	Uncertain future remediation or compensation costs
Noise and aesthetic impacts	Remediation costs or obligations	Risk posed by future regulatory changes
Residual air and water emissions	Compliance costs	Product quality
Long-term waste disposal	Permit fees	Employee health and satisfaction
Uncompensated health effects	Environmental training	Environmental knowledge assets
Change in local quality of life	Waste management	Uncertain future remediation or compensation costs
	Environmentally R&D, Maintenance	Sustainability of raw material inputs
	Legal costs and fines	Risk of impaired assets
	Environmental certification/labeling	Public/customer perception
	Natural resource inputs	
	Record keeping and reporting	

The internal environmental costs are more important to the company's management than the external environmental costs; and this indicates the possibility of recognizing the future responsibility of the company.

Environmental management is producing useful data for decision-making as a primary objective, and environmental management accounting is responsible of provides successful information to managers, investors and other internal and external users, used to determining whether environmental goals have been achieved, and what changes must happen to the environmental protection plan.

There are positive indicators of environmental accounting practices in companies and business organizations in developing countries, but the practice of environmental accounting is not enough, Accounting technology is expected to keep pace with societal demands and solutions for social, economic, and environmental challenges, so environmental accounting is the solution to achieve sustainable development.

Also, awareness of environmental safety is necessary to achieve environmental balance, because it determines environmental corporate policy; by controlling pollution; Compliance with relevant rules and regulations; and allocate part of its money to protect the environment, while calculating the number of materials used and may harm the environment.

Environmental accounting is an area that determines resource use, measures, and reports the costs of a company's environmental or environmental impact. Costs include cleaning or remediation costs for contaminated sites, environmental fines, penalties, and taxes, purchasing pollution prevention technologies, and waste management costs [10].

Investors are increasingly demanding companies to adopt environmental accounting strategies that reduce the damage to the environment and do not reduce the value of shareholders. because environmental accounting strategies aim to produce an environmental report which will increase the value of the project [47].

According to Yakhou and Dorweiler (2003) [48], companies are expected to participate in environmental accounting to:

- Reassuring consumers that they take their responsibilities seriously
- Comply with national guidelines
- Compliance with financial reporting requirements
- Express the company's environmental concerns and communicate it to a group of stakeholders.

Environmental accounting used to predict the impact of environmental issues on future financial performance to create an area for making informed investment decisions, which greatly affects free cash flow in the future, and thus contributes positively to shareholder value.

The problem with creating environmental accounting indicators is that there are no agreed rules or standards for recognizing the measurement, and disclosure of environmental information, either within the same industry or across industries.

Accounting issues and environmental reporting

Environmental accounting seeks to achieve a set of objectives at the national, corporate, and social levels and can be defined in the following:

1. Measuring the net contribution of companies and this is done by matching the environmental costs of environmental activities with the benefits accruing to society.
2. Assist in achieving effective control of activities and providing the environmental performance of the project by providing information with the environmental impact on the project objectives, plans, policies, and contributions in the field of environmental protection for the community parties.
3. Prepare environmental pollution reports at the national level to obtain the indicators that help in monitoring and following up the pollution resulting from the various activities, and work on the necessary studies to reduce it and provide financial credits.
4. Planners assist the country by providing accounting reports with information that shows the available balances of natural resources from a specific date, enabling the devices to allocate these resources among the various uses of the various costs.

5. Contribute to achieving sustainable development that has emerged as a response to the fear of pollution.

The accounting profession worked on a new strategy aimed at preparing more information-rich financial statements that include information on environmental issues because the disclosure of the environmental efficiency of the company plays a real role during the assessment of the company's success, with more disclosures that meet global concern for the environment at the same time increase the accountability of organizations that go beyond the traditional role of providing information to the owner's interest, and consequently, an international accounting standard should be established to regulate these disclosures [49].

The extent of the countries progress in achieving sustainable development, we can dimension of sustainable development are divided into four dimensions:

1. Economic dimensions: It includes several dimensions, including:
   A. Ensure the right of the individual to natural resources. B. Stop wasting resources.
   B. The extent of the responsibility of developed countries for environmental pollution and its treatment.
2. Social dimensions: It includes the following dimensions:
   A. Stabilization of demographic growth.
   B. The importance of population distribution.
   C. Full use of human resources.
3. Environmental dimensions: It includes the following dimensions:
   A. Protect natural resources.
   B. Water maintenance.
   C. Soil protection and use of pesticides.
   D. Climate protection.
4. Technological dimensions: It includes the following dimensions:
   A. Use clean technology in industrial companies.
   B. Reducing emissions of gases.
   C. Preventing the degradation of the ozone layer.
   D. Adoption of improved technology [50].

Finally, by examining the annual reports of different companies, it was found that the companies do not disclose any financial information about environmental issues, but most organizations try to be environmentally friendly not only to avoid the penalties and other costs associated with the environment, and to take advantage of the greater benefits that they may obtain.

Environmental Industries:

Based on the need to preserve the environment and achieve sustainable development, new industries have emerged that work to reduce pollution and are generating significant revenues and profits named environmental industries. The definition of "environmental industries": According to [51]."The environmental goods and services industry consists of activities that produce goods and services to measure environmental damage to water, air, and soil, or to prevent, limit, reduce or correct it, In addition to problems related to waste, noise and environmental

regulations, this includes cleaner technologies and products and services that reduce environmental risks, reduce pollution and reuse sources."

The environment industry is divided into three main categories:

1. Pollution Management Group: It consists of goods and services that are provided for an environmental purpose only.
2. A group of "cleaner technologies and products": consists of goods and services that continuously reduce or eliminate environmental impacts and are often supplied for purposes other than environmental purposes.
3. The "Resource Management" group: It consists of goods and services that may be linked to environmental protection, but the primary purpose of it is not to protect the environment.

Reporting forms for the company's sustainable development:

Information on sustainable development is communicated through certain forms in the form of a set of reports attached to the published financial statements to report on sustainable development, and these models are:

First: List the adjusted profit with the burdens of fulfilling the responsibility for sustainable development: It aims to show the impact of the company's contributions in the field of sustainable development on the net profit, and clarifies the impact of environmental, social and economic contributions on this profit, whether voluntary or compulsory.

Second: A list of the modified financial position to fulfill the responsibility for sustainable development: It aims to provide information on the resources available for use in the areas of environmental, social and economic performance and the corresponding rights of others.

Third: The financial list of the effects of failure to fulfill responsibility for sustainable development: It aims to provide information that reflects the results of a critical measurement of environmental and social processes that lead to inappropriate deviations in environmental and social performance.

Fourth: Multidimensional Environmental and Social Performance Report: It aims to provide information that reflects the results of measuring the overall environmental and social impacts that lead to the sustainability of development.

Based on The results of the study by Noor et al. In 2015 indicated that the Jordanian public shareholding industrial companies registered in the Amman Stock Exchange applies (include) the elements of sustainable development in their financial reports, as the general average of the elements of sustainable development is 77.2%. The study also indicated that the environmental elements were included in the financial reports in the Jordanian public joint-stock industrial companies at a high level, as the general arithmetic average of the environmental components reached 77.4%. And the inclusion of social elements in the financial reports in the Jordanian public joint-stock industrial companies at a high level, where the general arithmetic average of the social elements reached 78% and finally, she indicated that the economic elements were included in the financial reports in the Jordanian public joint-stock industrial companies at a high level, where the general arithmetic average of the economic elements 76.2%.

Table 5. The results of the study by Noor et al. In 2015

Elements of sustainable development	Arithmetic mean	Standard deviation	Degree of significance
Environmental elements	76.8	0.696	high
Social elements	78	0.659	high
Economic elements	76.2	0.733	high
All Elements of sustainable development	**77.2**	**0.584**	high

Finally, the results indicated that the inclusion of sustainable development elements in the financial reports provides information that helps in decision-making in the Jordanian public shareholding industrial companies at a high level, and this study makes the following recommendations for companies:

First: Giving environmental factors the importance they deserve, as they affect the financial reports of the Jordanian public shareholding industrial companies and affect their reputation.

Second: Emphasizing the need for Jordanian public shareholding industrial companies to adhere to aspects related to social

And environmental responsibility, due to their clear impact on financial reports.

Third: The need to take into account the extent of adherence and commitment to the economic elements, as they affect the financial reports in the Jordanian public shareholding industrial companies.

Fourth: Work to find appropriate mechanisms and solutions to deal with the problems or obstacles facing the Jordanian public shareholding industrial companies in implementing the elements of sustainable development.

Based on the study of Dr. Mossa Saleh in 2015, the results of the study on identifying the role of environmental awareness in the application of environmental accounting disclosure and its importance for investors in industrial public joint-stock companies, the most important results that the researcher reached through the study are:

Table 6. The results of Study of Dr. Mossa Saleh in 2015

No.		T- test
1	The company's management level of awareness of environmental matters and disclosure of environmental accounting information.	61.12
2	The existence of legal legislations related to environmental accounting disclosure and disclosure of environmental accounting information	52.9
3	Disclosure of environmental accounting information and financial performance of companies	65.10
4	Disclosure of environmental accounting information and the company's ability to obtain loans	66.84
5	Disclosure of environmental accounting information and the competitiveness of the company	25.85
6	Disclosure of environmental accounting information and pricing of the products produced by the company	88.53
7	The company's management level of awareness of environmental matters and Jordanian legislation, improving financial performance, and imparting the legal character of the facility	0.05

1. The companies have sufficient awareness of the importance of environmental accounting disclosure and the application of environmental accounting they have, but they lack experience and the appropriate qualification to apply environmental accounting and the appropriate environmental accounting disclosure.
2. That the Jordanian legislation contributes to the application of environmental accounting disclosure, and there is a noticeable development in these legislations that cover many environmental aspects, but these legislations deal (shyly) very much, as the legislation exists but is not activated.
3. That the establishment's application of disclosure of environmental accounting information will improve the financial performance of the facility, as the optimal use of energy leads to a reduction in production costs and thus increased profits and the environmental revenue that results from the proper disposal of waste and industrial companies 'waste.
4. There is a relationship between the environmental accounting disclosure at the industrial companies and their access to credit facilities by the banks. The Jordanian banks take into consideration the industrial companies 'disclosure of the environmental situation in them when granting the required credit.
5. Disclosure of environmental accounting information in industrial companies leads to giving them a competitive advantage, leading to improvement in their performance, especially in the long term, by increasing their ability to market their products and reducing marketing costs for their products.
6. Disclosure of environmental accounting information in industrial companies enables them to obtain governmental and international support through government agencies and international organizations, and helps these companies obtain consumer satisfaction and increasing its profitability in the long term.
7. Disclosure of environmental accounting information in industrial companies contributes to raising the efficiency of the cost system followed in those companies.
8. The level of the company's management's awareness of environmental matters and Jordanian legislation, improving the financial performance and imparting the legal character of the facility, is very low among the responses of investors and financial managers in each of the areas.

We noticed through the two previous studies that the researchers reached exciting results about the disclosure scores in the Jordanian companies about the environmental reports were not high but medium, where the degree of disclosure ranged between 60-75% and these rates are not high and this left an impact on the progress of the companies as the effect of disclosure Environmental accounting information on several important points such as the financial performance of companies, the ability of the company to obtain loans, the competitiveness of the company, and the pricing of the products produced by the company. Therefore,

more attention should be paid to adding non-financial reports such as environmental reports because they clearly affect the progress and continuity of the company, and its sustainability.

And based on the previous studies on Jordan, it was found that the most prominent results are the following

1. The issue of environmental awareness in Jordan needs to be activated and developed, by directing the media towards the environment.
2. Activating the role of environmental control directorates in monitoring installations polluting the environment and training employees and granting them the status of a judicial officer.
3. Jordanian legislation related to the environment is in place and its legal texts are good, but it needs to be implemented seriously.
4. The bodies regulating the accounting profession in Jordan are failing in issuing and reviewing the disclosure instructions issued by the Securities Commission especially disclose related to environmental protection.
5. The international accounting standards have not yet issued any special standards in the environmental accounting system that contributes to the application of this system.
6. The Jordanian investor's lack of experience and know-how in the issue of environmental accounting and environmental accounting disclosure, and the importance of containing the financial statements on environmental accounting data.

2. Conclusions & Recommendations

2.1. Conclusions

Sustainable accounting is a tool for achieving sustainable development because there is a growing need for companies to understand global environmental, social, and economic consequences. So the company must demonstrate its social responsibility, but traditional accounting based on historical financial data not covers this point, and it now starts increasingly dependent on non-financial data to sustainable development. Since sustainable accounting is a new branch of accounting, some companies are still concerned about their application, and stakeholders emphasized that sustainable accounting and reporting are positively linked to sustainable development and there are consequences for non-compliance which will reflect on companies, so they need to reduce the risk and other activities regulatory.

Sustainable accounting report enhances decision-making quality because this accounting information is necessary for accountability and comparison, and this information can be invalid or opaque, which poses a risk to the company when reviewing it from consumers, suppliers, investors, and surrounding communities and identifying potential sanctions from the government that has become aware of the organization's contribution to sustainable development.

There is a positive relationship between implementing sustainable accounting and supporting sustainable development in Jordan. Because there is a possibility to implement sustainable development to meet the needs and desires of current and future generations with the awareness that the impact of Jordanian industrial activities will affect all society.

There is a negative relationship between environmental financial accounting and supporting sustainable development in Jordan because there is a small amount of environmental information that was disclosed in the financial statements, although the policies and procedures that enable officials and accountants take a growing trend to promote sustainable development but environmental information is still disclosed descriptively in the financial statements, although Jordanian companies are moderately interested in environmental aspects compared to social and economic aspects, all companies focus on economic performance while enhancing their social image through following the policies of contributing to projects that serve society.

Accountants play an important role in accounting for sustainable development through a change in their roles when applying sustainable development accounting. The main role of accountants was using management accounting tools in the calculations through environmental management accounting systems to achieve the sustainable development goals of their organizations.

We noticed through the two previous studies that the researchers reached exciting results about the disclosure scores in the Jordanian companies about the environmental reports were not high but medium, where the degree of disclosure ranged between 60-75% and these rates are not high and this left an impact on the progress of the companies as the effect of disclosure Environmental accounting information on several important points such as the financial performance of companies, the ability of the company to obtain loans, the competitiveness of the company, and the pricing of the products produced by the company. Therefore, more attention should be paid to adding non-financial reports such as environmental reports because they clearly affect the progress and continuity of the company, and its sustainability.

Accordingly, we conclude the following:

1. The concept of sustainable development is a modern concept as a result of concern for environmental issues and natural resources in order not to harm and preserve future generations and to perpetuate the bid for those resources.
2. The concept of sustainable development achieves three dimensions is the economic dimension of the social dimension and the dimension of the environmental, and economic dimension means to increase production capacity of the economy through available resources to achieve prosperity for society, also environmental dimension of linked with preserving natural resources and protecting them from depletion and degradation.
3. Social development can be achieved in society when producing good quality products at reasonable prices that meet their desires and ambitions, with companies focusing on modern technologies such as continuous improvement techniques and comprehensive quality management.

4. Sustainability accounting is related to a continued assumption, which means the company continues to meet the needs of interested parties, with extensive management responsibilities.
5. New accounting standards must be developed to provide accounting data that can be used for comparative, and linked with the environment and social dimensions.
6. There are limitations in the conceptual framework of financial accounting at some levels and maybe not in conformity with the requirements of achieving Sustainable development.

2.2. Recommendations

1. Granting companies that maintain the environment privileges by the government by granting them tax exemptions or incentives to reduce taxes imposed on them to encourage them in the case of using devices that work to protect the environment, or working to produce electric energy by solar cells.
2. We must work to create a cadre interested in sustainable development in various disciplines such as accounting, economics, management and laws, engineering that can deal with sustainable development, and developing programs and training courses to inform them of other countries' experiences
3. Companies must adopt the environmental dimension in assessing annual performance through annual reports due to the interest of stakeholders.
4. The necessity of teaching subjects related to environmental issues such as environmental accounting and sustainable development in preliminary studies or higher studies of the accounting and management departments in the faculties of administration and economics
5. The necessity of the institutions, organizations, and professional societies concerned with accounting to develop a general framework consistent with the areas of environmental performance that include all environmental activities that companies perform or are likely to perform in the future.
6. There are major changes that occur in administrative management accounting processes, but they are necessary that contribute to sustainable community development. Therefore, more studies related to sustainable development and accounting must be submitted.

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