„SMART CITY" - A CHALLENGE FOR THE DEVELOPMENT OF THE COOPERATION MECHANISM BETWEEN EUROPEAN CITIES

"ORAȘUL SMART" – O PROVOCARE PENTRU DEZVOLTAREA MECANISMULUI DE COOPERARE INTRE ORAȘELE DIN EUROPA

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Abstract

Through this article we wish to emphasize the concept of "smart city" proposed by a new model of ranking cities, especially designed for medium-sized cities. In the beginning we approached the undervalued potential and the urged to identify the development possibilities. The Smart City Ranking responds to these requirements, and comes with a strategic view for middle-sized cities to leave the shade of the big metropolises. Ranking using six characteristics is the innovative element of the model, but collecting and processing data can turn out to be difficult outside some principles, or values. That is why we proposed fundamental values like: transparency, responsibility, flexibility, sustainability, competitivity, benchmarking. The next part of the article approached the smart city final ranking and we used examples to explain some of the positioned cities in the hierarchy. It has been analyzed the best ranked city, Luxembourg, and after that Innsbruck and Ljubljana. Furthermore the attention was focused on the three Romanian cities included in the ranking, and was realised a diagnosed of the Cluj-Napoca city.

Keywords: smart city, city-ranking, sustainable progress, competitivity.

JEL CODES: Q01, Q56, R11, R12.

Rezumat

Prin intermediul acestui articol se dorește atragerea atenția asupra conceptului de oraș "smart", propus de un nou model de ierarhizare, special creat pentru orașele mijlocii. În început au fost redate câteva aspecte privind potențialul nevalorificat al acestor orașe și importanța cunoașterii oportunităților de dezvoltare. Acestor necesități le răspunde noul model de clasificare a orașelor, special conceput pentru orașele europene de dimensiune medie, situate de cele mai multe ori în umbra metropolelor și orașelor mari. Diagnosticarea acestora din perspectiva a șase caracteristici „smart" este soluția propusă de noul clasament, însă procesul de colectare, prelucrare și standardizare a datelor nu este deloc ușor, iar buna desfășurare a acestuia impune respectarea unor valori fundamentale. Astfel, în lucrare am propus valori precum: transparență, responsabilitate, flexibilitate, sustenabilitate, competitivitate, benchmarking. Următoarea parte a articolului abordează clasificarea orașelor „smart", exemplificând și explicând pozițiile obținute de câteva dintre acestea. A fost analizată situația celui mai bine plasat oraș, respectiv Luxembourg, apoi Innsbruck si Ljubljana. În continuare atenția a fost orientată asupra celor trei orașe românești incluse în clasament, și a fost realizată o diagnosticare a orașului Cluj-Napoca în perspectiva devenirii "smart".

Cuvinte cheie: oraș "smart", clasificare urbană, progres sustenabil, competitivitate

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1. INTRODUCTION

The urbanization process had to face all the challenges that globalization and technological development brought. Fighting time and a diversity of changes that requires answeres, researchers have been focused a long period only on the development perspectives of the metropolises and large cities, even „the European Union, in particular, has devoted constant efforts to divising a strategy for achieving urban growth in a smart sense for its metropolitan city-regions" (Paskaleva, 2009). A couple years ago a team from Vienna initiated a project which extended the need of a smart development at a more local level, they showed that progress means more than people believe, and it can come in different shapes.

The project proposed the concept of „smart city" as a next step in the urbanization process, and emphasized the great unexplored development potential that medium sized cities have. The study it's actually a new and improved city-ranking, conceived to gather the necessary information for a realistic and detailed image of each city's strenghts and weaknesses. There is a need for accurate examination as the medium-sized cities do not have enough power to develop a variety of activities. That is why they are forced to choose between different branches, and concentrate on the selected ones.

Just like in the private sector, where each firm is searching for a specific aspect, that will distinguish it from the resembling, bringing more and more customers, and profit, so are cities concerned with finding competitive advantage. "The sources of competitive advantage of an organization lie in: availability of quantity/quality superior financial, physical and human resources; possession of superior technical, economic, organizational and managerial skills; occupying a superior position on the market" (Popa et al. 2011). The competition between cities is similar to the one between organizations, that's why the sources mentioned above are valid for cities too.

Although the construction of the competitive force can prove very expensive, this is all they need in the fight for investments, tourism and an incresed standard of life.

2. WHAT DOES SMART CITY ACTUALLY MEANS?

First of all, the word „smart" can generate confusion, leading us on wrong perceptions. Of course the connection with the informational technology has been kept, but the new concept brings an extended perspective over its sense. Smartness refers here at the capacity of a medium-size city to obtain a general increase of the most important sectors of life, only in a sustainable way.

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That is why it can be perceived like the "utilisation of networked infrastructure to improve economic and political efficiency and enable social, cultural and urban development", (Hollands, 2008). The reclamed infrastructure is used in a technological approached, and emphasizes the need of a "wired city" (Kominos, 2002).

Choosing smart cities, involved a complex measurement, based on specific criateria.

The population criteria (100.000-500.000 inhabitants) corroborated with at least one university, catchment area less than 1.500.000, and the Urban Audit coverage, revealed 94 cities but only 70 were included in the new city-ranking. The ranking is recommended as being more useful than the formers, because its objective is to compare the cities under six characteristics, not just from one point of view: economy, people, governance, mobility, environment and living. This explains also its capability to ensure in the end a corresponding position for each city, determined in very high conditions of objectivity.

The smart city is actually "a city well performing in a forward-looking way in these six characteristics built on the smart combination of endowments and activities of self-decisive, independent and aware citizens" (Giffinger et al. 2007). So, for the first time a ranking offers a global image of a city, and succeeds in the process of collecting data, analysing and standardization.

Each characteristic is described by a couple of factors, and each factor by a couple of indicators. Conforming to the "Smart Cities Final Report" the six characteristics are defined by 31 factors and these ones by 74 indicators. The project of smart cities says that a "smart" economy generates competitiveness through factors like: innovation, entrepreneurship, trademarks, productivity, flexibility and international integration. Also the industry of a smart city has a production process based on modern informational technology.

Data about social and human capital are included in the "smart people" characteristic, and is not only referring to the educational perspective, because it underlines in the same time the affinity of people towards long life learning, creativity, flexibility and also their involvement in social activities. For the "smart governance" characteristic the report promotes: the participation in the political process, the quality of public and social services, the administrative transparency as well as the ability to elaborate development strategies. "Smart mobility" is another characteristic which has two major components, modern and sustainable physical and virtual accessibility.

 A smart city has to have a "smart environment", focused on fighting and preventing pollution, protecting the natural frame, and sustainable resource management. Not less important than the previous areas,

the sixth characteristic "smart living", covers problems like: health, culture, education, tourism, safeness, housing quality and social cohesion; which reflects the quality of life in general, so this characteristic "gives profound attention to the role of social and relational capital in urban development. Here a smart city will be a city whose community has learned to learn, adapt and innovate" (Coe, Paquet, Roy, 2001).

Now is understandable why this city-ranking is different, and saying that is not focused on the economic sector is not enough, because its unicity comes from the variety of the measured aspects. It was designed as a modern tool capable to be used in further survey of the actual situation, making it possible for rest of the cities to be included in the ranking.

3. THE NEED FOR "SMART CITIES"

The "smart-city" can be perceived as a superior phase of the town twinning procedure. Despite their size, the cities suffered major changes, so it was absolutely necessary an upgrade of the cooperation possibilities, especially considering the gaps of the town twinning – which is more about the cooperation between two communities, from two different countries. The twinning is based on historical relations or on a diversity of similar aspects, like: population, geographical coordinates, development level, economic or social problems.

The problem is that most of the towns "twined" along the time because one of the specific aspects mentioned above or to solve together a certain problem. But, once that problem is solved, or reduced, or the time has past, most of the twinnings will exist only officially, with no real materialization. These weaknesses, along the need of facing as efficiently as possible globalization and particularly problems, were the main factors which led to the appearance of the "smart approach".

The "smart city" came to promote a new type of bounding, and it is based on creating a "wireless network" of al the cities capable to cooperate in a "smart" system.

Now, the cities are connected through their results, and are obligated to fulfill some standards in order to be recommended as "smart". Here the change is obvious, we have six major fields that are being measured, and help to diagnose the development level for each city attempting to the ranking. It is exactly the membership to this ranking, which ensures the cooperation framework. Also, the collaboration it is no longer realized through common projects, or activities, this modern phase is about a new approach, about an "abstract" cooperation, that can also be known as a "wireless" one – where cities cooperate through different models, through common standards, or solutions.
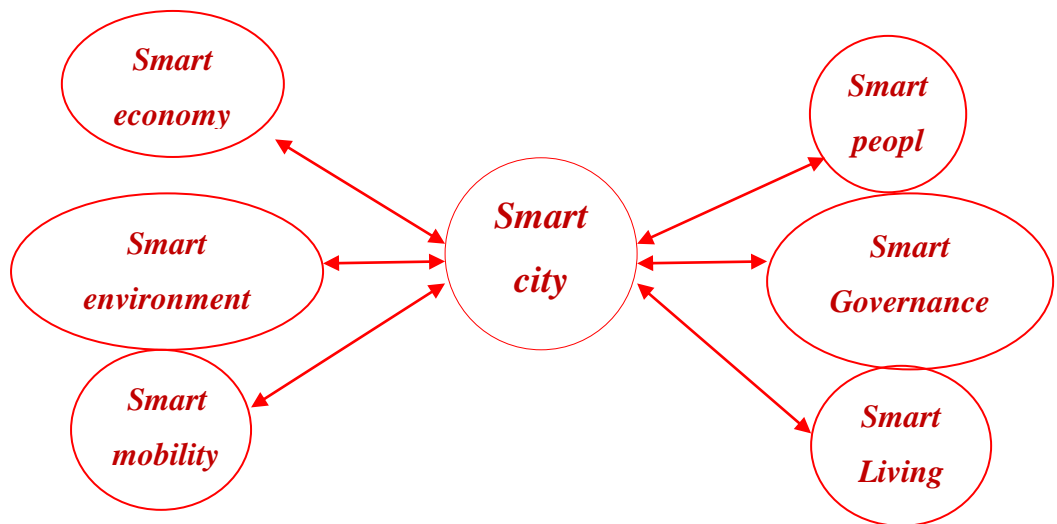
FIGURE 1 - THE SIX CHARACTERISTICS OF A SMART CITY.

4. PROMOTED VALUES BY THE "SMART CITY" CONCEPT

The selection process of smart cities requires activities which involves highly and permanent interests in keeping a faire attitude towards citizens. Each phase is built on moral principles. Furthermore is absolutely necessary that the data provided by the local authorities, to be extracted from secure statistics. This means that cities must collect the primary information in faire and secure conditions, so in the end any study based on them to have the same realistic features. Regardless the innovative character of this city-ranking, its final objective depends on the commitment shown by the local officials.

Considering these aspects, a first valuable concept that smart cities need and promote is transparency. We can't loose it from sight in the gathering process, the analysis phase, nor in the various forms of using the results in the future.

Transparency concerns also the possibility for any interested person, to acces information. It becomes clearly that transparency of the data accessibility plays a major role in the building process of a smart-city.

Transparency brings in our attention the need for responsibility. Every local or foreign actor is forced to behave in a responsable way with the citizens, the public goods, the natural environment and to show respect for the social values. Obeying the law and following moral priciples are not just responsibilities; this has to emerge from a cultivated spirit in taking care of people around us. This way, they are heading for success regarding a responsible public behaviour, helping the city to advance in the hierarchy. Building such a moral public and social spirit in humans, is not an easy thing to do; this

requires time, patience and even stobberness, in order to fight the non-values promoted by the media, easily adopted by the young generations, and not only.

The concept of "smart city" was proposed especially for the medium-sized cities, considering their capacity to transform themselves. This is why the third value recommended is flexibility. Of all the factors that generates it, the most important is the size of a city. The bigger the city, the harder it is to change, regarding any aspects. At a medium size, it is easier to promote new models, behaviours or even social values. Comparing with a larger city, in this case the development strategies are easier to implement, and therefore objectives and purposes are more likely to be achieved. In addition, smart-cities are defined by a more pronounced specificity, in more than one way.

The Smart City-Ranking was created as an instrument capable to diagnose the health of a middle-sized city; it is actually scanning the city's development rates giving a comprehensive view of its potential. The value of this tool is even bigger than believed because if it was constructed for cities of medium size, it can be universally applicable. This means that the model can be used for ranking other cities too, whether they are larger or smaller, maintaining the logic of the original research. It emphasizes the possibility of developing new ranking models for other cities categories, keeping the "smart" approach.

The smart city model promotes a general applicability, which also distinguish it from the rest. Its innovative character is based more on the specific approach, analysing an urban area from six points of view.

Going further with identifying specific values for smart cities, it has to be mentioned the need for sustainability. This means that a smart city has to have the necessary force to maintain the achieved progress. Having a sustainable vision can prove very difficult for a city, mainly because of its high complexity. In the case of smart cities the sustainability is applicable to their economy, environment, governance, education, transport, society. So, no matter the sector, as long as it is sustainable it can face and value future changes.

Progress is harder to achieve in an environment with no competitors. Having no comparable progress is difficult for a city to keep its general motivation and to determine its clearly position in the city hierarchy. Smart cities have a specific competitivity which gives them the impulse to evolve.

In this game the chances for a better place in the ranking depends on the competitive advantage that a city has. They are forced to focus on developing the potential they have and to minimize as much as possible the vulnerabilities.

Smart cities do not compete only against those included in the ranking but also against the rest of the medium sized cities and large metropolises. That is why cooperation is vital for them. Cities have to collaborate in order to stay connected with the latest changes. Therefore, benchmarking is the proper way for exchanging know-how. A full understanding of this concept can help cities get smarter. Benchmarking is actually about progressing using examples, about keeping the city "open minded" and aware of its opportunities and weaknesses.

Resources are limited and displayed in a heterogeneous way across the European space. This is the reason why some of the cities progresses faster than others, and have the capacity to draw models for the rest of them, which will have the opportunity to choose the best suitable pattern in reaching efficiency.

5. PERFORMING SMART CITIES

Throwing a glance at the Smart-City Ranking, we can't help to notice that the top cities are concentrated in Scandinavia, Benelux and Austria. Also, very well ranked are Montpellier and Ljubljana. The first position belongs to Luxembourg, which seems to have the smartest economy and conforming to the Smart City Final Report, "three factors, economic image, productivity and international embeddedness are extraordinary well rated while othere three are closer to the average but still above". Luxembourg performs also when it comes to smart people, smart mobility and smart living.
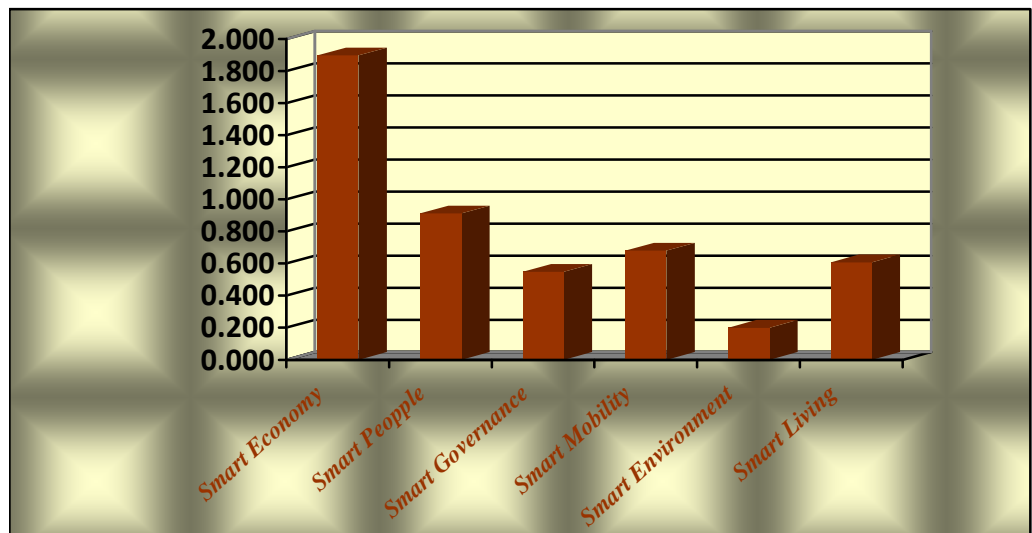

FIGURE 2 - LUXEMBOURG RESULTS – ADAPTATION FROM WWW.SMART-CITIES.EU.

Although, it has great results for each of the above characteristics, the factorial analysis shows that it owns these results to some of the component factors of each of them. For example in the smart people

characteristic the city scored very well in social and ethnic plurality but very low in flexibility and creativity; for smart mobility it is the international accessibility that covers the deficit generated by the low level of sustainable, innovative and safe transport systems. In smart living, it seems that the city has some problems with cultural facilities, and educational facilities (it's lowest score), but it has great results in touristic atractivity, health conditions and social cohesion. So the city holds the first position in the ranking especially because of some specific factors which scored extremely well compared to the others cities, propelling Luxembourg on the first place. This is not specific for Luxembourg, it is a current situation among all the other cities.

Another top ranked city is Innsbruck, which holds the third position in smart living, where only the individual safety and social cohesion are closer to the average, the rest of the factors being very high, (touristic atractivity, cultural facilities and health conditions). Innsbruck scored very well also in smart governance, especially because of its transparent character; and in smart mobility where despite the fact that the availability of ICT – infrastructure is under the average the result is ensured by the local and international accessibility.

For advancing in the ranking, the city should focus on two characteristics, smart people and smart environment, both placed under the the average. What concerns the first one, only two factors are above average, social and ethnic plurality and participation in public life; the lowest level belongs to flexibility, followed by creativity, but these can be solve by paying attention to the level of qualification and affinity to life long learning, factors which could be improved easier .
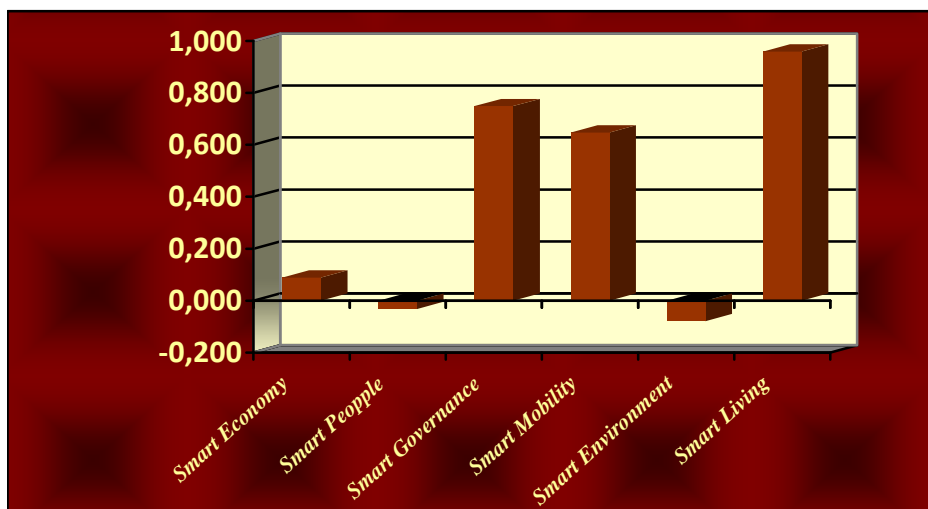

FIGURE 3: INNSBRUCK RESULTS – ADAPTATION FROM WWW.SMART-CITIES.EU.

The biggest problem that Insbruck has is the environment, none of the factors registered levels capable to balance the very low result of pollution.

A surprise is Slovenia's capital Ljubljana. The city scored high in five characteristics, only the smart governance was ranked under the average level. It is important to mention that the best result that Ljubljana has is for the smart economy characteristic, and it is assigned to a huge level of one factor, economic image and trademarks. Also the smart environment is a strenght of Ljubljana, only the pollution being a little bit under the average. The smart governance is a problem because only one factor, public and social services, is above average, if the participation in decision-making can be easily recovered the transparent character of the governance requires consistent and constant efforts.
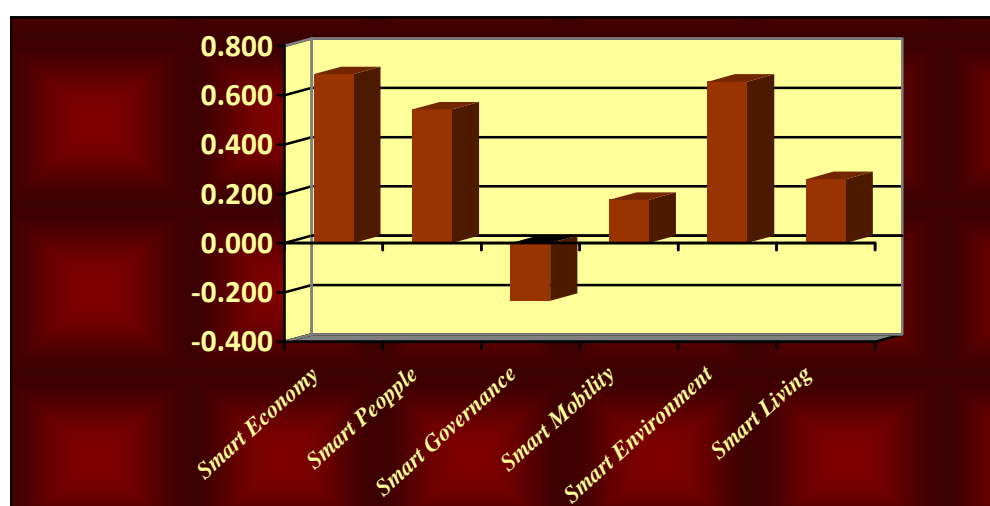

FIGURE 4: LJUBLJANA RESULTS – ADAPTATION FROM WWW.SMART-CITIES.EU.

Heading our attention to the cities ranked lowest it is noticeable that they represent the new EU member states. Unlike the cities holding the top positions, which are dealing problems regarding the smart environment, most of these ones gain their position through the score in this particular feature: Timișoara, Patrai, Larisa, Sibiu, Kaunas, Craiova. Liepaja makes a difference, by occupying the twelve position in smart people characteristic. Surprising or not, three Romanian cities are included in the smart city ranking. The best score was registered by Timișoara, placed on the fifty-five position. The city scored its best for smart environment, holding the fourth position in this feature, due to the atractivity of its natural conditions and its efforts in fighting pollution. The problem is that the city is under average in the rest of the characteristics, but the lowest level belongs to smart mobility, which could be improved through consistent investment in information and communication technology, and also in ensuring local accessibility. Smart people is also a problematic aspect, but the redressing is not that hard, the participation in public life can be changed organizing different events, encouraging citizens to

participate. The level of qualification can be raised guiding people towards the educational institutions, but in the same time supported by a dynamic economy.

 "Based on the statistic evidences, in Romania in the period 2006-2008, living standard was decreased. Even if we come down at the Romanian cities level along the last years we can find that the urban living standards had a steady trend downward", (Androniceanu, 2011a). Another problem specific for the three Romanian cities is the smart living, particularly because of the housing quality, cultural facilities and individual safety. We believe that all these development factors are connected in a very strong interdependence, and that the improvement of one factor will have a positive impact over the rest.
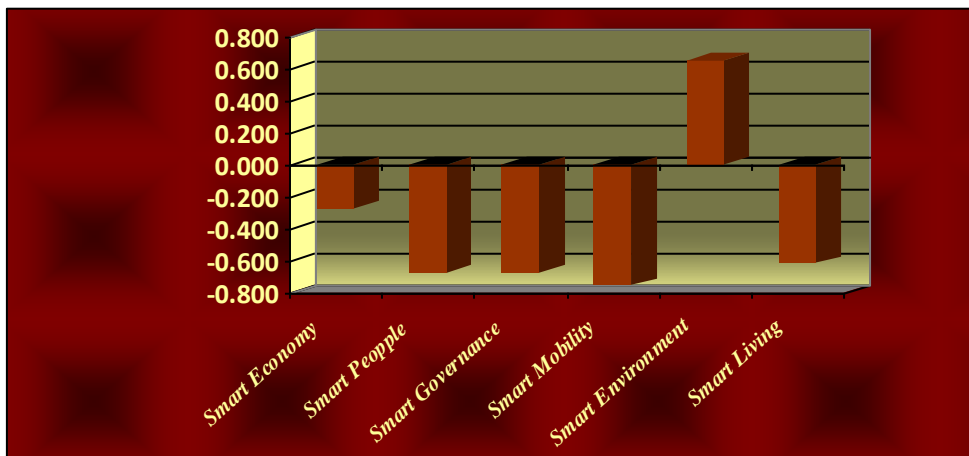

FIGURE 5 - TIMIŞOARA RESULTS – ADAPTATION FROM WWW.SMART-CITIES.EU.

European cultural capital in 2007, Sibiu outperforms Timișoara in only one characteristic: smart governance. If the level of transparent governance and public and social services are the same for the two cities, the difference is made by the participation in decision-making, which in Sibiu is higher and above average compare to Timişoara where the factor is under average.
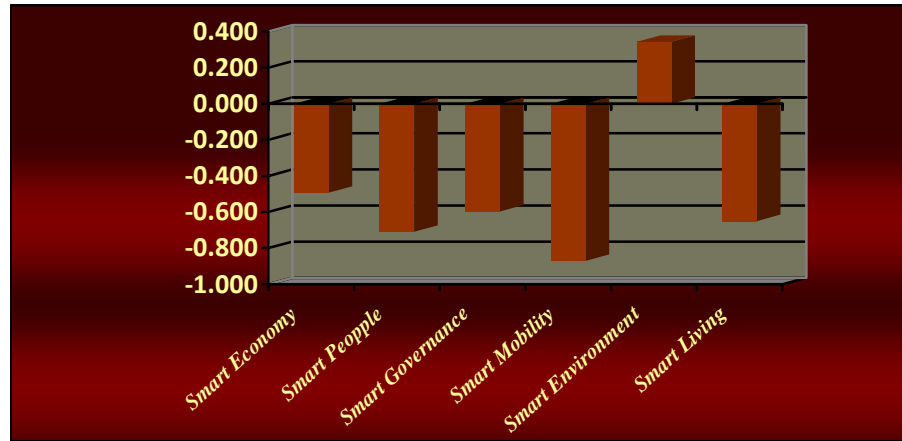
FIGURE 6 - SIBIU RESULTS – ADAPTATION FROM WWW.SMART-CITIES.EU.

The final positions are officialy hold by Craiova and the only Bulgarian cities included, Pleven and Ruse, but in fact they might have already lost their ranks.

Craiova has serious problems with the smart mobility characteristic, which has the lowest result, mainly because of the reduced international accessibility and ict-infrastucture. The next problematic field is smart governance, where the participation in decision-making has the lowest level out of the Romanian cities, and the importance of this aspect comes from the fact that "citizens take part in the activities initiated by the local authority if they understand the essence of the problem and what is expected of them. Then they come up with initiatives, ideas, and proposals that are sometimes unexpected, useful and practical, even for professionals from the local authority", (Androniceanu, 2011b). Craiova is not doing well in smart living either, the housing quality, the cultural facilities, and individual safety being the factors which needs immediately attention and investement.
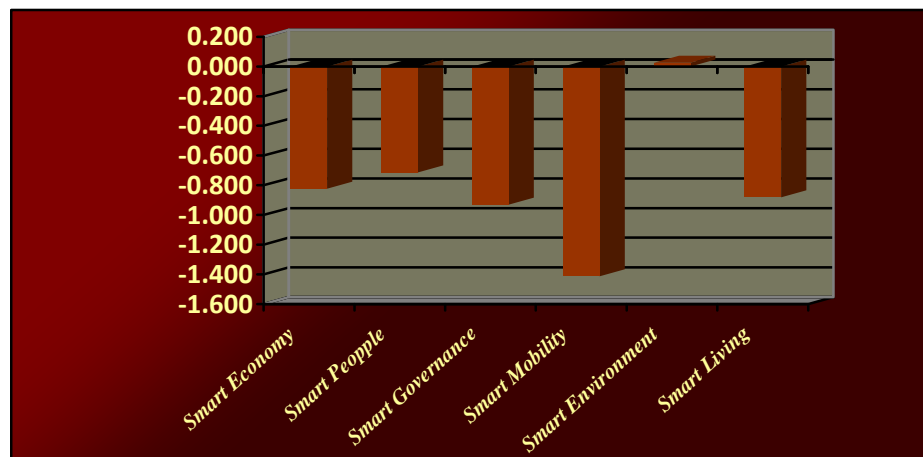

FIGURE 7 - CRAIOVA RESULTS – ADAPTATION FROM WWW.SMART-CITIES.EU.

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The position of Craiova in the ranking is a very exposed one. At a new measurement the city most probable wil no longer be recommended as "smart". During the last years the mobility problems increased, so the city urgently needs new means of transportation. Another problem was the aggravation of public violence, which directly affected the individual safety and the touristic atractivity.

6. "SMART" PERSPECTIVES IN ROMANIA

This ranking wants to set an objective for cities that are not included, in order to develop and compete for a position in the rank, and also for the ones that are already there, to fight their way to the top.

Comparing the Romanian cities, eligible for the "smart" character could be Cluj-Napoca, which scores very good at the internal indicators. So, considering the basic criterias the city respects the population rule, it has 309.136 inhabitants, also the educational problem is solved cause it hosts five public universities, and seven private universities, and the third criteria is not an issue eiher, the city has a catchement way under 1500.000.

Cluj-Napoca has a dynamic economy, being the third developed city in Romania. During the past 20 years the city struggled to build a modern image, so today is recommended as an IT and software centre, being an example for the rest of the country. Cluj is the house of three industrial parks, which generated along the past few years thousands of jobs and attracted investements of hundreds million euros. Multinationals companies like: Emerson, Ranbaxy, Softvision, Impact, Office Depot, Fujikura Automotive, Siemens, etc. found a proper environment in Cluj for developing their businesses. Even in these crisis moments, after the withdrawal of Nokia, the city is analyzed by important foreign companies which have plans of investments, for example Avic, Bosch, DeLonghi, Tata Motors.

The latest plan for Cluj-Napoca was brought in to the public attention a couple days ago by the ministry of bussines environment, who proposed the construction of a Silicon Valley, so the future economic development is based on the IT profile.

Like any other city in Romania, Cluj has its governance problems, but it was exactly the economic boom, the factor that pressured the public sector to improve its characteristics. So, considering the perspectives of economic development it is an emergency to solve at least some of the most recurring problems.

When it comes about smart people, we could say that Cluj-Napoca is a national centre of education, the largest university in the country, "Babeș-Bolyai University" being a symbol of the city. Besides this, the universities in Cluj are ensuring wide possibilities of specialization. The economic atractivity of the city is also a consequence of the qualification of the labour force.

Approaching the transport infrastructure Cluj is connected to the European road network through E60, E81, E58, and is also located on the future Transilvania Highway. The city is in the same time a railway junction, because it is crossed by two out of the nine national railways; and is accessible by air through Cluj-Napoca International Airport. Of course besides these strenghts we have to say that is absolutely necessary the orientation towards the present conditions of sustainability and safeness of the transport systems.

The next aspect refers to the natural resources, and Cluj-Napoca is a city located in a very rich area. The underground resources completes the landscape heritage, and it has to be mentioned here the accessability of the city to different types of landscapes. The environment is actually an opportunity for the Romanian cities in the European fight for the "smart" property, but pollution is a common concern. Cluj-Napoca is affected especially by industrial pollution, noise pollution, also during the time the river, which crosses the city, Someșul Mic was polluted through accidental discharges.

One last problem about Cluj-Napoca refers to the quality of life, and here the city dispose of great potential. First of all is the centre of many cultural events, international conferences, concerts, expositions, festivals, contests; and the three theaters, two operas and five cinemas are encouraging the cultural life of Cluj-Napoca. About the health conditions, the city is the home of ten public hospitals, equipped with modern devices; and for example The Military Hospital is one of the best in the country. In addition Cluj-Napoca has a reputation of a safe city for its citizens and this is also one of the aspects which helped a lot in becoming an important touristic attraction.

This brief analysis does not has the purpose to present Cluj-Napoca as being already a "smart city", but for showing that it has development potential exactly on the factors requested by the smart property. If the city follows the specific directions at the renewal of the ranking could be included in the "smart network".

CONCLUSIONS

Becoming a smart city also depends on how much the public authority gets involved, and its availability in sending the necessary data. Also their real objective should be more than just getting the smart character, it actually should be the performances brought by the requested improvements.

Approaching Cluj-Napoca, a developed city of the country, we can't help to think at the possibility of extending the "smart" trend for a new category of cities, for example the cities with a population between 50.000 and 100.000, like Târgoviște, or with a population until 50.000, like Sighișoara or Miercurea Ciuc.

Even though we analyzed the case of Cluj-Napoca, in Romania and other European countries are plenty more cities eligibles to become smart, that is why the next ranking will be more difficult, each city will be even more prepared, whether is an outsider wanting to get a position, or already a smart city fighting for improving its rank.

The concept of smart city came to cover the missing pieces in the puzzle of the literature in this field. The conceiving of an instrument capable of emphasizing the development possibilities that medium-sized cities have, it was an unrealised emergency. Smart cities must focus on periodic analysis of their current situation.

Positioning themselves in the special hierarchy, represents for most of the cities, a vital opportunity to leave anonymity. Searching for a place within the national and international urban system, can be easier using the statute of smart city, because it recommends a certain level of development.

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