UNDERSTANDING A SMART CITY. SOCIAL, ECONOMIC AND POLITICAL PERSPECTIVES. FROM SMART CITIES TO INTELLIGENT COMMUNITIES

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ABSTRACT

This paper seeks to understand the social, economical and political perspectives of a smart city and the efforts to transform itself in a better, livable place for all its citizens. We know that urban agglomerations are at an unprecedented level of growth. The public sector tries to link with stakeholders to prevent the rapid urbanization being a crisis and trying to come up with solutions for these problems, such as dealing with scarcity of resources and replacing them with positive resources instead of negative resources (Friedman, 2010), the aging infrastructure, air pollution caused by emissions of greenhouse gases. In this paper we will see that one approach can be to emerge three factors (the social, political and organizational, economic factors) and not take them as separate entities. We have example of good practices from our neighbors in Europe, but a perfect smart city does not exist; we have Paris who is recognized as the most popular destination for tourists, but lacks in social cohesion (according to Forbes), Barcelona has made great lengths in managing traffic congestion and made remarkable efforts in having smart sustainable energy projects, but needs a changing in the quality of governance. We went to great altitudes in Romania also. We can praise the efforts of Alba Iulia on focusing on the relationship with the citizens – one project which was successfully implemented was e-ticketing and an application that allows the citizens to interact directly under dispatching regime. This paper tries through the political and economical context as well as the social inclusion and initiatives to collect and see in a thoroughly manner the strategies that make an ordinary city into a smart city.

KEYWORDS: *ICT, innovation, smart city, sustainable development.*

1. INTRODUCTION

This paper wants to show the different aspects and factors that lead to the path of a smart city. The development of isolated solutions that are not interoperable, different solutions for each of the areas of a city have been observed and cataloged as possible risks. The practices showed that without smart governance we can't attract the necessary funds in supporting sustainable projects. Several cities showed great potential in being smart cities and this paper suggests that this is the case for some of the cities of Romania. We will analyze some cases in achieving the goal to a more healthy and livable community. The city in its composition is a government unit that grows in complexity and importance as the population transits from rural to urban areas at a speed that reality has to face now. In 2008, the moment was marked when the world's population passed the 50% threshold in urban areas (https://www.unfpa.org/). A century ago, the world's population in urban areas was 5% opposed to the year of 2011 when it was 50.5%. By 2050, the world's population is projected to reach 6.3 billion people. This rapid and growing urbanization raises a variety of risks that specialists have to take into account: pollution and physical risks such as deterioration of air and transportation

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conditions, economic risks such as unemployment, risks of people migrating between regions and countries who cannot integrate into different cultures and society's norms (maybe they have been forced to move because of the country's political realities or natural disasters) (Dirks et al., 2010; Dirks et al., 2009).

2. SHAPING THE CONTEXT OF SMART CITIES

In the next table we will see the list of Intelligent Cities throughout the globe.

Table 1. The list of Intelligent Cities

Region	Cities
Asia	Chongqing (China); Hong Kong (China); Jia Ding (China); Jiading New City (China); Shanghai (China); Tianjin (China); Tianjin Binhai New Area (China); Bangalore (India); Hyderabad (India); Jaipur, Rajasthan (India); Ichikawa (Japan); Mitaka (Japan); Shiojiri City (Japan) Yokosuka (Japan); Astana (Kazakhstan); Whanganui (New Zealand); Gangnam District, Seoul (South Korea); Hwa Seong Dong Tan (South Korea); Seoul (South Korea); Suwon (South Korea); Singapore (Singapore); Changhua County (Taiwan); Chiayi City (Taiwan); Hsinchu City (Taiwan); Hsinchu County (Taiwan); Kaohsiung City (Taiwan); Keelung City (Taiwan); Kinmen County, Taiwan (Taiwan); New Taipei City (Taiwan); Taichung City (Taiwan); Tainan City (Taiwan); Taipei (Taiwan); Taitung County (Taiwan); Taoyuan City (Taiwan); Yilan County (Taiwan); Kabul (Afghanistan); Tel Aviv (Israel); Doha, Ad-Dawhah (Qatar); Dubai Internet City (United Arab Emirates)
Africa	Nairobi County (Kenya); Cape Town, Nelson Mandela Bay (South Africa)
Europe	Tirana (Albania); Tallin (Estonia); Espoo (Finland); Oulu (Finland); Besançon (France); Issy-les-Moulineaux (France); Frankfurt, Hesse (Germany); Mülheim an der Ruhr (Germany); Heraklion, Crete (Greece); Trikala (Greece); Sopron (Hungary); Reykjavík (Iceland); Isle of Man (Isle of Man); Malta (Malta); Brabantse Kempen Region (Netherlands); Eindhoven (Netherlands); Castelo de Vide (Portugal); Évora (Portugal); Moscow (Russia); Barcelona, Catalonia (Spain); Hammarby Sjöstad (Sweden); Jönköping (Sweden); Karlskrona (Sweden); Stockholm (Sweden); Västerås (Sweden); Birmingham, England (United Kingdom); Dundee, Scotland (United Kingdom); Glasgow, Scotland (United Kingdom); Knowle West, Bristol, England (United Kingdom); London, England (United Kingdom); Manchester, England (United Kingdom); Sunderland, England (United Kingdom)
North America	Burlington, Ontario (**Canada)**; Calgary, Alberta (Canada); Edmonton, Alberta (Canada); Fredericton, New Brunswick (Canada); Grey County, Ontario (Canada); Hamilton, Ontario (Canada); Kelowna, British Columbia (Canada); Kenora, Ontario (Canada); Kingston, Ontario (Canada); Lethbridge, Alberta (Canada); Moncton, New Brunswick (Canada); Montreal, Quebec (Canada); Nelson, British Columbia (Canada); New Westminster, British Columbia (Canada); Niagara Falls, Ontario (Canada); Nunavut (Canada); Olds, Alberta (Canada); Oshawa, Ontario (Canada); Ottawa, Ontario (Canada); Ottawa-Gatineau, Ontario-Quebec (Canada); Parkland County, Alberta (Canada); Pickering, Ontario (Canada); Quebec City, Quebec (Canada); Saint John, New Brunswick (Canada); Sarnia-Lambton, Ontario (Canada); Sherbrooke, Quebec (Canada); St. Albert, Alberta (Canada); Stratford, Ontario (Canada); Sudbury, Ontario (Canada); Surrey, British Columbia (Canada); Toronto, Ontario (Canada); Vancouver, British Columbia (Canada); Waterloo, Ontario (Canada); Western Valley, Nova Scotia (Canada); Windsor-Essex, Ontario (Canada); Winnipeg, Manitoba (Canada); York (Regional Municipality of), Ontario (Canada); Adel, Georgia (United States); Albany, New York (United States); Arlington County, Virginia (United States); Ashland, Oregon (United States); Aurora, Illinois (United States); Austin, Texas (United States); Barceloneta, Puerto Rico (United States); Bettendorf, Iowa (United States); Bristol, Virginia (United States); Chattanooga, Tennessee (United States); Cleveland, Ohio (United States); Columbus Region, Ohio (United States); Columbus, Ohio (United States); Corpus Christi, Texas (United States); Dakota County, Minnesota (United States); Danville, Virginia (United States); Dublin, Ohio (United States); Dubuque, Iowa (United States); Florida High Tech Corridor (United States); Hudson, Ohio (United States); LaGrange, Georgia (United States); Loma Linda, California (United States); Marlborough, Massachusetts (United States); Mitchell, South Dakota (United States); Monmouth, Illinois (United States); New York City, New York (United States); Northeast Ohio (United States); Philadelphia, Pennsylvania (United States); Riverside, California (United States); Rochester, New York (United States); San Diego, California (United States); San Francisco, California (United States); Spanish Fork, Utah (United States); Spokane, Washington (United States); Walla Walla Valley, Washington (United States); Westchester County, New York (United States); Winston-Salem, North Carolina (United States)
Middle/South America	Durango, State of Durango (Mexico); Tuxtla Gutiérrez, Chiapas (Mexico); Curitiba, Paraná (Brazil); Piraí (Brazil); Porto Alegre (Brazil); Rio de Janiero (Brazil)
Oceania	Adelaide (South Australia); Armidale, New South Wales (Australia); Ballarat (Australia); Coffs Harbour, New South Wales (Australia); Gold Coast City (Australia); Ipswich, Queensland (Australia); Melbourne (Australia); Prospect, South Australia (Australia); Sunshine Coast, (Australia); Whittlesea, Victoria (Australia)

Source: adapted from http://www.intelligentcommunity.org/intelligent_communities_list

The Intelligent Community Forum (ICF) annually announces the cities which have become one of the Smart21 communities, winning a high score of five success factors to be a smart community (for example, broadband connectivity, work based on knowledge, digital inclusion, innovation, marketing and advocacy). Table 1 describes the cumulative list of cities by continents and regions granted by ICF at the current time. Practices in listed cities deserve attention. Also, ICF named the Top 7 intelligent communities of 2018, in ICF's words, "from Smart City to Intelligent Community":

- Chiayi City, Taiwan
- Espoo, Finland
- Hamilton, Ontario, Canada
- Ipswich, Queensland, Australia
- Tainan City, Taiwan
- Taoyuan, Taiwan
- Winnipeg, Manitoba, Canada

Chiayi City, Taiwan is one of the cities which have gone long way to develop itself. Chiayi is a provincial town of 270,000 in south central Taiwan, midway between Taichung and Tainan. 95% of its economy is in the services sector - wholesale and retail trade, transportation and warehousing, as well as accommodation and food - accounting for three quarters of the workforce. This city was ranked with the poorest air quality in Taiwan in 2014, but as a physician, Mayor Twu Shiing-jer has dedicated his entire administration and government to overthrow the unfavorable situation in an improvement of life and the quality of life in the city and many other areas.

What followed was a clean air initiative, launching a broadband network with over 1,000 Wi-Fi hotspots across the city, a new focus on digital education and much more. Working with ASUS, the city has set up a network of air quality monitoring stations called the Air Box. The measurement results are displayed in real-time on the LED panels on the main access roads, but also on the government website (https://www.chiayi.gov.tw/2015web/index.aspx). A public electric bike network, with 58 charging stations, reduces car travel, while an organic education program reaches schools and community groups. In 2015, the city managed to reduce the fine particle concentration by 12%, which is the nation's biggest gain. Also, in 2015, Chiayi City set up the "Solar Photovoltaic Setup and Promotion Team" and the "Renewable Energy Committee". The city's location on Tropic of Cancer makes it an ideal place for solar energy development and the city has installed solar panels on the roofs of 38 public buildings so far with 32 more buildings expected to be equipped by the end of last year. The public buildings currently are able to produce 3.6 million degrees of power a year and are expected to earn revenue of NTD 77 million over the next 20 years.

We saw in the example above the hardship of true work and development. It is truly a tremendous work when the administration of a city tries to meet a growing demand for more livable cities. But, what the researchers didn't tackle enough is the inclusion of certain factors, which finally will shape into a smart city: the social, economical and political views and their integration as one factor. As such, we recognize a gap in the current literature of the concept of smart city. This paper represents an empirical research of various articles and aims to suggest a framework and key elements for being a smart city, as well as strategic principles for making an inclusive city. Thanks to the technologies and innovations the world has benefited from a while now, ICTs (Information and Communication Technologies) represent a new function through which we can build and integrate critical city infrastructures and services. Solving the problems that arise in the city due to industrialization and urban agglomerations it requires a model to mitigate negative impacts and to make better, sustainable and healthy livelihoods.

3. LITERATURE REVIEW

Many authors and researchers tried to define the concept of smart city. There is a good reason why we still don't have an official definition and that is because the concept is used world-wide, but in different circumstances and with various characteristics. There are used many words for "smart" cities, but with the same labeling. For example, a smart city in my perspective represents a challenge in regard with accommodating the three factors and seen as one: the inclusion of economy, politics and social factor. In other consecrated opinions, more competent than mine, represent "connecting the physical infrastructure" with the IT and social component "to leverage the collective intelligence of the city" (Hartley, 2005). This section seeks to understand the concept of smart cities.

3.1 Key elements of Smart City definitions

Before exploring further the details of the implications of smart cities, we need to understand its key elements. The smart city concept itself is still evolving; therefore we are going to see the definitions of authors who are working in different domains, but with a common interest in the issue of smart cities.

Table 2. Definitions of the concept Smart City

"A city well-performing in a forward-looking way in various characteristics, built on the smart combination of endowments and activities of self-decisive, independent and aware citizens." (Giffinger & Gudrun, 2010)
"A city that monitors and integrates conditions of all of its critical infrastructures." (Rocheleau, 2003)
A city "connecting the physical infrastructure, the IT infrastructure, the social infrastructure, and the business infrastructure to leverage the collective intelligence of the city." (Hartley, 2005)
A city "combining ICT and Web 2.0 technology with other organizational, design and planning efforts to de-materialize and speed up bureaucratic processes and help to identify new, innovative solutions to city management complexity, in order to improve sustainability and livability." (Toppeta, 2010)
"A city striving to make itself "smarter" (more efficient, sustainable, equitable, and livable) (https://www.nrdc.org/)
"A city that gives inspiration, shares culture, knowledge, and life, a city that motivates its inhabitants to create and flourish in their own lives." (Rios, 2008)

We recognize from the definitions above the conditions that it needs to be fulfilled by cities in order to transcend from an ordinary city to a smart city. They describe either the environment as a current existing positive condition or the intent that remains to be achieved (McKenzie, 2004). As per NRDC definition, in order to raise the quality of life, a city needs to increase the accessibility to public services, employment, to be more equitable, all and all to enhance the positive conditions of livability in every way.

4. THE INCLUSIVE WAY IT'S THE ONLY WAY

We can't speak of an integrated city if we don't see it as a sustainable and innovative engine. The world crisis has certainly made a point of reference for European countries. Most countries are still struggling to find ways to recover their own economies. European governments face many challenges at all levels and are pushed to seek new solutions in times of budgeting and limited resources. International competitiveness demands to make the societal challenges more complex to

deal with. The concept of smart city is especially a guarantee for success in this sense. It promotes competitiveness and economic growth through education, high technology industries and homogeneous electronic connections. Creating the conditions for lifelong learning and innovation is a prerequisite for achieving smart cities. (Schwarz-Woelzl, 2014). We are not talking only in regards to European countries, but it would be preferable if the entire world would take act and be able to achieve what Europe strategy wished to fulfill until 2020: employment, research and development, innovation, climate change and energy, education, poverty and social exclusion. Each country shares the same common goals and is used as a reference framework (https://ec.europa.eu/info) at national and regional levels. In this paper we try to explain the positive outcomes of being a smart city and the challenges that a city is transitioning to a better structure. In the following point of our research, we will talk about each potential perspective of a smart city (society, economics and politics).

4.1 The social dimension

Since the beginning of outlining the concept of sustainable development it has been highlighted the importance of social dimension. The definition of Bruntland Report in 1987 stated that sustainable development is the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Report, 1987). What does it mean the social sustainability concept? It is a frequent answered question by researchers and emphasized in urban literature, therefore various definitions exist in the current literature in different context, but it lacks in the specificity of the subject. In this current discussion we are keen on presenting and focus on the most important aspects by studying the essential literature in this area. Many articles and research papers put the focus on understanding smart cities from technological and policies aspects instead of addressing also the topic of people and communities as an integral part of smart cities (Chourabi, 2012). People are the ones indispensable for a city and transform the respective city into a creative and innovative one. "Smart city is about a mix of education/training, culture/arts, and business/commerce" (Bartlett, 2005). The social factor is a key driver to smart city, therefore the creativity that is born from people, education, learning and knowledge has a great impact to smart cities. An emerging creative class can only be acquired through a suitable climate (Popescu et al., 2016). By a creative city we should understand the high quality of life of its citizens that provides a more informed and educated environment and being able to bring up to life a real vision in regards with creative jobs and workforce, knowledge networks, innovative entertainment and a sustainable economy (Florida, 2002). A prestigious author (Winters J. V., 2010) analyzed why smart cities are evolving, who chooses to move in a smart city and which people decide to stay. In his opinion, a smart city is for the people who have higher education and also he showed that these cities have skilled workforce (Glaeser & Berry, 2006). With no questions, therefore, the skilled people attract the high-tech industries into worthwhile communities (Eger, 2000). That is why the initiatives that stress the social factor and allow members of the community to participate in the governance and management of the city become so successful. The economic gains are being shown by the knowledgeable cities and it means "a city that was purposefully designed to encourage the nurturing of knowledge" [26 art conceptualizing]. The urban development is assured by common interests from the public administration and its active citizens and by becoming competitive and creative.

4.2 The economical dimension

Every economy is linked by certain factors in its activity, like productivity growth, consumption, wages, not to mention strong policies, changing social environments and so on. In the view of experts and researchers, for every problem there must be a solution. So, what is the solution for an every changing economy and how can we apply it without disrupting its flow? On top of that, we are facing with a fast-paced rhythm the population who's looking to move to a bigger city, to a

smarter city, everyone wants to live in a high-tech community with facilities and an overall a better life. Sustaining an active labor market is not easy and is needed a strong policy to reduce the risk of unemployment and poverty. Another aspect is the pollution which exist in these cities because of the traffic jams and industries which migrate there; reducing greenhouse gas emissions, improving the energy efficiency of urban infrastructure, integrating international market and being able to transform by having a spirit of innovation and entrepreneurialism means a smart economy and cutting-edge technology. There are 6 holistic characteristics of a smart city and these are: smart economy, smart mobility, smart governance, smart environment, smart living, smart people (Giffinger, R. et. al., 2007). But, they can't exclude one another and we need to look at these characteristics as a hole, not individual one by one. If the smart city doesn't have the smart society and skilful people it can't attract business; if it doesn't attract the high-tech industries, there's going to be a downsize in the employability; if there's a community with high statistics in unemployment people will look elsewhere to move and make a living; and so on. These challenges are expected to be dealt by smart city solutions, sustain the innovation economy and prosperity of cities, support employment and fight against poverty, improving the city's infrastructure and maintain the level of security. The capacity to create healthy business systems through ICTs (information and technology communications) is vital for the industrial development and economic outcomes (boost in the productivity, business creation, new jobs, increase in the workforce).

4.3 The political dimension

In this paper, when we refer to political dimension we include the governance and policies applies in a city. Various cities have benefited from the emergence of ICTs that made efforts to revamp their governance through technology. This ICT-based governance is known as smart governance. The initiatives implicate alliances between stakeholders and public administration to better serve citizens and improve the quality of life (Giffinger et. al., 2007; Odendaal, 2003). We saw earlier, that the characteristics of a smart city can't mutually exclude one another. An inclusive city can't be designed without its economic development, its social activity or without good governance. "Smart Governance, related to participation in decision-making processes, transparency of governance systems, availability of public services and quality of political strategies" (Vanolo, 2013), hence, governance implies transparency, respecting the law, being responsive (serve its citizens), is equitable and inclusive, and effective and efficient (http://www.goodgovernance.org.au/about-good-governance/what-is-good-governance/). "Stakeholder relations" refers to four main issues: the ability to cooperate among stakeholders, support of leadership, structure of alliances and working under different jurisdictions (Scholl et. al., 2009). Trustworthy partnerships based on people from the community and public-private sector is an essential characteristic and perspective for a smart city to function at appropriate parameters.

5. FROM SMART CITY TO SMART/INTELLIGENT COMMUNITY

It is already clear worldwide that is an increasing need to implement smart solutions in major metropolises to harmonize the effects of massive urban agglomerations in a cost-effective manner. At the same time, there is a clear need to bring the development of smaller cities/communities closer to the level and context conditions of large cities, since combining these approaches can generate the convenience of the opportunity to reduce congestion - by reversing or even diminishing migration to the big urban centers, as well as to the chance of diminishing the level of carbon emissions and noise pollution, all of the aspects in bringing sustainable development in harmony with technology which are certain added values, both in the current context and especially for a better future. Instead of having a "people extractive approach" as per James Robinson and Daren Acemoglu (authors of the book entitled "Why nations fail: The Origins of Power, Prosperity, and Poverty" where the institution theory is explained), from small communities and lure them in the

bigger cities, an inclusive mentality would be a win-win situation. For the sustainability of a city with high-tech technology or better said the intelligent city, it will always come up to social and cultural issues, those that actually seemed from the beginning of this development and are triggered by the lack of historical education that is unfortunately visible today and will be also in the future.
"Smart City's main objective is to make citizens' lives easier in every possible way – sustainability, transportation, etc. – using data collection and measurement as one of the essential tools." (Belissent, 2011). Intelligent cities competed in Romania with a number of pilot projects implemented in several urban centers. Some cities from Romania, for example Bucharest, Oradea, Timișoara, Constanța - each of these cities has gone through great lengths regarding the Smart City solutions, but in some cases they are pilot projects: SMS parking, smart lighting, solutions Urban Wi-Fi, environmental sensors or video surveillance. And all of these are undergone through major high-tech technologies known as ICT which in some vies is a "facilitator of sustainable goals" (https://geographica.gs/en/blog/smart-community/). On the other hand, "Smart Communities seeks to thrive in a context of broadband economy, its engine and reason for being". That means a strong accent on the community, no matter if it's urban or rural, because the progress happens when the local economy is in agreement with the globalization. Both concepts are emerging and shaping, transcending into more complex terms. Of course, Romania has shown some improvements, but has a long way to go in achieving a place with its cities among the smart cities or intelligent communities. Business models for intelligent communities need to have modular development tailored to the local ecosystem (administration, industry, citizens with local objectives), part of an EU market for solutions, products and technologies. Intelligent solutions can be funded if intelligent equipment reduces operational costs, combining investments from various decision makers / actors in the market so that the cost becomes reasonable and the investment is long-term. Citizens must be involved in developing intelligent solutions and in contributing funds, bringing the advantage of palpable benefits. The procurement process needs to be updated, by involving the cities in governance and joint investment entities as well as EU / Financial Institutions. In conclusion, intelligent city projects are extremely complex, require multidisciplinary expertise, major resources, and propose fundamental technological and social changes in how individuals and citizens interact with a city. Efforts by a city to move towards a smart one are rewarded by ensuring sustainable development and increasing the quality of citizens' lives, but an intelligent community puts an accent on each singular individual, innovation, attracting international entrepreneurs, connecting through systems the industry with education and pursuing economic growth with the help of digital tools and without endangering the environment or with minimal exposure.

6. CONCLUSIONS

This study represents an empirical approach of smart cities and tried to show the positive outcomes of an inclusive city by combining three important factors: the economy, society and politics/governance. We stressed the fact that, without innovation and communication, it cannot be possible the transition from an ordinary city to a smart city. Through a smart city, in our opinion, we see a creative potential that can be exploited in a positive way by boosting the economy and attracting high-tech industries and educated people. The politic context is also a vital component; an innovative government cannot improve without proper normative drive in its policy (Eger & Maggipinto, 2010). From the studied literature, we developed an explanation on the impact which has an important influence between the relationships of the three dimensions discussed above. New opportunities and fascinating improvements all over the world were being brought to our attention by smart cities. The needs of population are only growing and the specialists have to reconsider the structures of a city, from public administration to strategies in handling the pollution and infrastructure malfunctions. A sustainable city is achievable through ICTs and e-government

projects that strengthen economic efficiency and enhance the involvement of people in their communities.

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