

FUTURE OF DURRES: SMART CITY AND SMART UNIVERSITY

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ABSTRACT

Moving towards becoming a smart city is the best approach for the city of Durres, in Albania, in order to solve its current problems, as well as deal with the future development requirements in a sustainable manner. The information and communication technologies, together with the scientific know-how and human resources of the Aleksander Moisiu University, would assist the city of Durres navigate through challenges, achieving a mutually beneficial smart city-smart university relationship. Since the beginning of the 1990s, the city of Durres and the whole of Albania have been plagued by unregulated, chaotic development and uninformed decision-making processes. Our purpose through this paper is to show that the smart city approach — by teaming up with the Aleksander Moisiu University and applying ICTs, smart computing and the Internet of Things — is the best way forward for the city of Durres to cope with such difficulties, and that is proven by means of various examples of other cities around the world, which have had comparable development dilemmas. Using methods of observation and secondary data analysis, we have collected data from successful examples of smart cities, such as Mannheim, Tartu, Vilnius and Bristol, reaching to quantified results and conclusions that the smart city approach is the right alternative for the city of Durres and the Aleksander Moisiu University of Durres would be a valuable partner in implementing such an alternative.

Keywords: Smart city, smart university, ICTs, smart computing, IoT.

1. INTRODUCTION

The smart city approach towards the future progress of urban areas is exactly what the city of Durres, in Albania, needs in order to solve its current problems, as well as plan for the years ahead, and doing it in harmony and collaboration with the Aleksander Moisiu University would be an added value, since the university will help to assess, elaborate and implement the new technologies needed.

In 1990, Albania abandoned the communist regime and the country was transformed overnight. The freedom of movement associated with the new political regime brought about a demographic revolution. In 1989, only about 36.1 percent of the population lived in cities,

whereas today the share has grown to 60 percent (UN DESA Population Division, 2018). Durres was also completely overhauled. The population grew to about 220,000 inhabitants (Bashkia Durres, 2018), from about 79,000 inhabitants that the city had in 1989. The free market economy and the demographic explosion brought about great social and economic development, as well as various problems and challenges.

As of 2006, Durres has its own university, named after the Italian-Austrian actor of Albanian origin Aleksander Moisiu. Since its foundation, the Aleksander Moisiu University of Durres has grown into a full-fledged centre of higher education and scientific research, having today about 20,000 students and becoming a valuable partner in assisting Durres to overcome its problems.

Our main aim through this paper is to show and prove that the smart city approach for Durres — by teaming up with the Aleksander Moisiu University and applying information and communication technologies, smart computing and the Internet of Things — is the best way forward to deal with its obstacles. We would also explore the possibilities that the Aleksander Moisiu University has to offer, especially the Faculty of Information Technology, in order to help Durres with the testing, evaluation and implementation of high technologies, with the data collection and data administration, as well as conduct studies based on such data in order to assist the development and better management of the city. By resorting to data and examples from other cities, which have successfully engaged in smart city initiatives, we would prove our thesis and help promote similar initiatives for Durres.

The paper will discuss the smart city and smart university concepts and will also briefly dwell on the problems faced by Durres, as well as on some initial approaches in order to digitalise some of the services offered to the public, them being the first rudimentary steps towards reaching the smart city status.

2. The concepts of smart city and smart university

The concept of smart city is rather new. Simply put, smart cities are considered those cities employing high technologies in order to overcome obstacles and to lead them towards greater development and prosperity (Sharma & Rajput, 2017, p. 2).

Starting with the Industrial Revolution, urbanisation has become the order of the day because cities have turned into the centre stage of economic growth and human development. However, urbanisation is accompanied by problems, such as poverty, high population density, unemployment, unjust wealth distribution, inadequate public services, environmental degradation, housing deficiencies (Keyfitz, 1984; Keyfitz, 1995). Actually, Keyfitz (1995) warns that, if such problems continue to persist, “a breakdown is inevitable” (p. 67).

Various strategies are adopted in order to overcome such challenges and, since the late 1980s, sustainability has been considered as the catch-all solution, which includes also the smart city approach, an approach employing the ICTs in order to address and solve the above stated challenges (European Parliament Directorate General for Internal Policies [EPDGIP], 2014, p. 9). The smart city represents the digital city taken one step further. The digital city, which is defined as the “comprehensive, web-based representation, or reproduction” of the real city (Couclelis, 2005, p. 5), is taken one step further towards interconnectedness. Smart cities take advantage of smart computing in order “to make the critical infrastructure components and services of a city — which include city administration, education, healthcare, public safety,

real estate, transportation, and utilities — more intelligent, interconnected, and efficient” (Washburn et al., 2010, p. 2). Smart cities emphasise and rely on the communication between the city itself and its inhabitants, as well as on the high technology making such communication possible (Alawadhi et al., 2012). A survey conducted by Smart Cities World (2018) has concluded that the backbone of smart cities is their ability to share data and their inhabitants participating in the city governance (p. 4).

Smart computing — defined as the “new generation of integrated hardware, software, and network technologies that provide IT systems with real-time awareness of the real world and advanced analytics to help people make more intelligent decisions” (Bartels, 2009, p. 3) — is at the heart of smart city approach, an approach which may take the form of various separate initiatives: smart economy, smart governance, smart environment, smart people, smart mobility and smart living (EPDGIP, 2014, p. 17; Centre of Regional Science, Vienna University of Technology, 2007, p. 12).

By means of ICTs, universities are also transforming themselves to the level of smart university, they are turning into hubs of effective management and administration (Uskov et al., 2018). New technologies are making universities and the higher education to become more democratic and easily available, as well as they have “changed the way individuals interact and live within the university context” (Nuzzaci & La Vecchia, 2012, p. 16). Taking advantage of internet, universities are digitalising many of their academic and administrative services, and all what students or the teaching staff need is just a smart device and they can access almost everything, from registration to class attendance and lecture consultation or other services, such as library, conferences, sport or dorm facilities, etc. On the other hand, the universities use the data generated to better plan the use of their resources.

2.1 Smart city and smart university: The theory behind the relation

It is a well-known fact that universities serve as motors of progress and development for the areas where they operate, because they act a lot like gravitational fields attracting the most talented youth and the best minds to study and work together. Furthermore, universities play an important role to assist cities in attaining the smart city status. This is the reason why Dunkin (2017) observes:

It’s important that universities work in close collaboration with the other two elements — businesses and local government to ensure they help to develop and test new technologies, turn ideas into prototypes and unlock and analyse urban data for the good of a city’s citizens whilst delivering digitally savvy graduates to the workplace.

Francis (2016) reiterates the importance of universities, since smart cities are not just about smart technology, but they are sustained by smart people, as well.

3. City of Durres: Problems and challenges

Durres is the second biggest city in Albania, a strong economic powerhouse and the most important national transportation hub the country has. The port of Durres is the only international freight port in Albania, while serving also to more than 850,000 passengers per year (Durres Port Authority, 2019). The road and railroad networks criss-crossing Albania and going further to neighbouring countries are all interconnected in Durres.

This reality — to some extent made possible by the strategic geographic position of Durres — has spurred the economic growth and development. However, it also poses huge environmental and management challenges (Polytechnic University of Tirana & Durres Port Authority, 2014, pp. 11–14). Such challenges become even more problematic when taking into consideration the fact that Durres is also the main coastal and maritime tourist attraction in Albania (Institute of Statistics, 2019). Being the main transportation hub of Albania, puts the local public infrastructure of Durres to a great deal of stress, deteriorating it at a faster pace than anywhere else in Albania.

Being a port city, Durres has attracted a lot of foreign investments, especially from Italy, in the textile, clothing and footwear industry. This has brought about the enlargement of the city in terms of both population and surface. However, the greater economic development and prosperity was and still is accompanied by persistent problems.

Since the early 1990s, the local government is faced with the inability to supply the public services needed. Even today, Durres still suffers from dire shortages in water supply, unpaved streets and unsuitable sewage network systems, especially in the newly-urbanized city peripheral areas. On top of that, there are still tens of thousands of informal housing settlements built without proper legal permits, representing a real nightmare in terms of administration, regulation and provision of public services.

The demographic explosion brought to Durres tens of thousands of people previously living in rural areas. Overall, they were the least educated part of the Albanian population, and that is the reason why 42.5 percent of the population of Durres has completed only the compulsory primary education (Helvetas Swiss Intercooperation, 2014, p. 41).

4. Smart city: Applications for better city management

The smart city approach has been embraced by numerous cities around the world, albeit for different reasons and focusing on different areas of city management. So far, there is no city which has reached the full status of smart city, no city has implemented smart city initiatives across all the six levels: smart economy, smart governance, smart environment, smart people, smart mobility and smart living. Looking at their most pressing problems, cities turn to smart initiatives to help solve them.

One of the earliest success stories is the city of Mannheim, in Germany, which is somewhat special for the role played by the University of Mannheim. Mannheim has successfully applied smart initiatives in energy distribution and renewable energy generation, as well as in the public transport sector, in the medical services and environment protection. All these smart initiatives are made possible by “the interplay of many partners across many spheres”, including the University of Mannheim and private companies (Cake, 2015). Such interaction exists and thrives thanks to the Open Data Portal, managed by the Municipality of Mannheim, which helps the creation of clusters and exchange of information.

Horizon 2020 is the European Union’s research and innovation programme, which for the 2014-2020 period was assigned a budget of 80 billion euros (European Commission, 2014, p. 5), and the city of Tartu, in Estonia, has become part of the SmartEnCity project funded by the Horizon 2020. Smart environment, smart mobility and smart living initiatives are at the core of the SmartEnCity project, which aims to improve energy efficiency and increase renewable energy supply with the objective to become a zero-carbon emission city (TECNALIA Research

& Innovation, 2019). By virtue of this project, Tartu renovated 42 apartment buildings, lowering their energy usage by almost two-thirds.

The city of Vilnius, in Lithuania, is also employing the smart city approach in order to protect environment, improve the living standard of its inhabitants and increase the efficiency of its public administration. By virtue of the open data policy adopted and the wide digitalisation of its services, the efficiency of the public administration in Vilnius has improved considerably, whereas the public transport usage grew by 13 percent after the installation of a traffic monitoring and management software, the introduction of e-tickets etc (Dudzeviciute, Simelyte, & Liucvaitiene, 2017, pp. 1443–1444).

The UK Smart Cities Index 2017 named the city of Bristol as the top smart city in the United Kingdom. In its drive towards future progress, Bristol has entered into a unique partnership with the University of Bristol. Both, city and university, have joined forces and resources to build the smart city together. They have created the Bristol is Open, which is a sort of a programmable and open to all digital city-wide platform for the promotion of interaction and innovation (Navigant Consulting, 2017). This platform — made up of various, numerous and diverse components — is facilitated by the City Operating System, which was developed and is maintained by the University of Bristol.

4.1 Smart city: Initiatives empowered by ICTs and IoT

The four examples of cities applying smart city initiatives — Mannheim, Tartu, Vilnius and Bristol — have one thing in common: all those initiatives are empowered by the ICTs and IoT. It is them which make the smart city possible.

The examples put forward are very diverse in nature. Some of the smart city initiatives aim towards energy efficiency, some others towards improving public services or even achieving green transport and protection of environment. However, they are all made possible by the application of ICTs and the IoT, they are all are made possible by connecting together all the concerned parties. At the very foundation of those initiatives rests a common network of data collection, data administration and data sharing infrastructure. Without the needed information gathered, there would be no data to work on and the respective decisions would be uninformed. Such network systems — like the Open Data Portal of Mannheim in Germany, Bristol is Open of Bristol in the United Kingdom, the Open Data Capital Vilnius of Vilnius in Lithuania — serve as thoroughfares facilitating all sorts of smart city initiatives. The application of ICTs, as is the case of Vilnius which is recognised as the free public Wi-Fi capital of Europe, drives the interplay of all actors and factors generating smart and interconnected alternatives of sustainable development.

5. Future of Durres as smart city: The difficult long road ahead

As of today, the city of Durres lacks an integrated smart city strategy. The Municipality of Durres has not adopted any document or action plan to serve as guidelines towards achieving the smart city status. However, there are some initiatives which might be considered as the first glimpses of the smart city approach.

By 2010, Durres implemented the Oracle iGovernment platform, which served to digitalise the local public administration and many of the public services offered, as well as facilitate better and faster communication with the inhabitants.

On the other hand, the Municipality of Durres has taken part in various projects funded by different European Union programmes, even though most of them were intended to promote tourism. Projects APPRODI, TOURISMED and TUR.GRATE2 were aimed towards encouraging cooperation among the local government units and the tourism industry across borders at regional level.

There are three other projects — AdriMOB, PoWER and SUMPORT — which might be considered as having incorporated some degree of smart city initiatives. All three projects, involving numerous partners from Mediterranean countries, are focused in promoting sustainable mobility among the coastal cities, eco-friendly transport, exchange of information and protection of environment. As part of the SUMPORT project, Durres will be assisted in drafting and adopting a sustainable urban mobility plan. Such a plan has yet to fully materialise since the project is still on-going, but that would be maybe the most consistent representation of a smart city initiative.

Apart from these projects funded by the European Union, which may serve to offer the first impulse towards concrete smart city initiatives, Durres lacks a concerted and integrated policy for working towards becoming a smart city.

5.1 The potentials of Durres-University of Durres cooperation

Since 2006, the Aleksander Moisiu University of Durres has been contributing to the future development projects of the city of Durres. However, the untapped potentials are great

In the past, the Municipality of Durres has sought the assistance of the Aleksander Moisiu University when drafting the local urban development plan (Municipality of Durres & Cooperation and Development Institute, 2016, p. 46), the local economic development plan, the local social inclusion plan etc. Yet, this is not exactly a long-term on-going working relation, since the above were only isolated examples of cooperation.

At least in paper, since 2010, when Durres adopted the Oracle iGovernment platform, the vision of moving towards becoming a smart city is there, but the tangible initiatives are lacking. There is no denying that implementing smart city initiatives requires considerable funding and, in so far as Durres is concerned, they are hard to come by. However, much can be achieved if city and university resources are combined together, emulating other successful examples, like the Bristol is Open.

The smart city, more than anything else, comes in the shape of a high-tech information and communication infrastructure, which serves as the bedrock for any other initiative, be it from the public or from the private sector. Bristol is Open of the city of Bristol in the United Kingdom is exactly that kind of infrastructure, which is made available to all public institutions and private economic operators. Bristol is Open functions a joint venture between the Municipality of Bristol and University of Bristol.

Definitely, coming up with a similar high-tech information and communication infrastructure is costly, but putting together the funding from the Municipality of Durres and the considerable scientific know-how and human resources of the Faculty of Information Technology of the Aleksander Moisiu University would make such an enterprise a lot more affordable.

The Faculty of Information and Technology has amassed great experience in this respect, since it contributed in building and maintaining the whole digitalisation process within the Aleksander Moisiu University. As of today, the Aleksander Moisiu University has one of the most efficient and effective internal ICT-empowered infrastructures in the country. The Aleksander Moisiu University is moving forward to becoming a fully-functional smart university in a newly-built campus where everything is connected and interconnected.

This experience could be brought to a much larger scale in the city of Durres. The problems the city suffers from have been there for a number of years and smart initiatives are the best to solve them, from energy efficiency to sustainable economic development and environment protection. Building a high-tech information and communication infrastructure across the whole city of Durres, which could very well be maintained by the Faculty of Information Technology of the Aleksander Moisiu University, would make use of smart computing and IoT to connect all, the public and the interested parties, gather information and help make the best decisions for the future development. Moving towards a smart city would make it much easier to solve the economic development paradox of Durres, which is the main coastal tourist attraction Albania has, but the present economic development, focused mainly on transport services, construction and industrial production, is damaging the very environment and cultural heritage the tourism industry relies on.

6. Future of Durres: Conclusion and recommendations

There is no doubt that the smart city approach works, and it works better than any other approach taken in the past. Examples of successful implementation of smart city initiatives are plenty, not just those of the four cities we mentioned above.

The city of Durres still has the same unsolved problems, since the beginning of 1990s. The population has grown a lot, followed by increased unemployment and by higher levels of criminality, especially among the youth. Due to lack of funds and qualified human resources, the Municipality of Durres has not been able to improve its capacities to offer the public services needed or make the necessary investments to improve the public infrastructure, in order to spur economic growth and development.

However, if there was a way to bring together all interested parties in the city in order to create a synergy among all the actors and factors, public and private, solving such problems the city of Durres suffers from would become easier. The smart city approach is that way and Durres needs, sooner rather than later, to adopt a strategy or an action plan to start implementing the smart city approach. Other cities in the neighbouring countries, like Podgorica in Montenegro or Dubrovnik and Zadar in Croatia have already taken the first smart city initiatives.

Cooperation with the Aleksander Moisiu University will help Durres overcome part of the funding problem. The Faculty of Information Technology has considerable scientific know-how and human resources in order to be part of any enterprise with the city of Durres in building the city-wide high-tech information and communication infrastructure. All the city needs is to build such infrastructure, and the Faculty of Information Technology of the Aleksander Moisiu University would be able to maintain it and come up with all the data computing and studies required for the other parties to make use of it in their investments or development plans. The city of Durres and the Aleksander Moisiu University would be able to offer the stage — the operating system, the data collection infrastructure made possible by the ICTs and IoT, the

city-wide Wi-Fi network to connect all users — for all the interested parties to put their innovative ideas into life and help Durres grow in a sustainable manner.

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