Collaborative Governance for Smart and Sustainable Cities of the 21st Century. Case Study: The City of Oradea

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Summary: Due to today's great societal challenges, such as climate change, demographic boom, resource scarcity, urban settlements find themselves trained in a tense race of reforming their urban development strategies. Turning cities into smart settlements, by improving their waste management and energy consumption seems like the only viable solution for a prosperous and sustainable future. Moreover, statistics show that smart cities create an auspicious environment for the establishment of start-up, as they provide incentives for citizens with creative and entrepreneurial skills. Accordingly, the objective of the current study is twofold: in the first instance, we would like to prove the existence of a causal link between the level of smart orientation in a city and the spread of start-ups, namely, the smarter the city, the bigger the number of start-ups, and vice versa by choosing as our case study, a city from the North-Western development region of Romania, Oradea; secondly, we stress, that the promotion of a collaborative governance model by the city leadership, involving all the stakeholders in the decision-making process enables smart orientation within a city.

Keywords: collaborative governance, e-governance, Oradea, smart city, start-up

1.   Introduction

Amsterdam, Barcelona, Stockholm, Hong Kong, Delhi, New York, Seoul, Vienna, Toronto, Berlin, Copenhagen are only a few of the megacities that have been consciously pursuing a smart city strategy for years. Lately, also several urban centres from the former post-Soviet space have adopted similar strategies and various cities from Romania have begun this process as well, whether declarative

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or factual: Oradea is one of these cities. On the other hand, following the EU trends, Romania has also acknowledged the importance of creating incentives for the development of Small and Medium Enterprises (hereinafter referred to as: SMEs), by subsidizing projects encouraging citizens to become entrepreneurs. Consequently, in recent years, the number of start-ups in Romania has grown considerably, the North-West development region, in which Oradea is situated being second in the number of established start-ups, following the central region, București-Ilfov. Thus, on the one hand, in the current research, we wish to analyse whether Oradea meets the necessary requirements in order to be called a smart city, and if it has the ability to create propitious background for the development of start-ups? On the other hand, we argue that there is a direct link between the effectiveness of governance and the achievement of a smartness-orientation in a city, emphasizing the role of collaborative i.e. participative governance. As the main hypotheses of .the study:

H1. We indentify start-ups as smart economy tools, which not only foster sustainable development within a city/region, but are also indicators showing the level of smartness within an urban settlement.

H2. Favouring collaborative governance by including the civil society and other stakeholders in the decision-making process within a conurbation makes it easier to develop and implement public policies meant to transform a traditional urban settlement into an intelligent city.

2. How does the specialty literature define smart cities and which are the indicators measuring the level of smartness in a city?

The notion of the 'smart city' was introduced in the academic literature in the 1990s', however, later scholars decided to represent or even to replace it with diverse concepts, varying from networked cities, techno cities, cyber cities, creative cities, digital cities, e-communities, intelligent city, telecity, wired city etc. Nevertheless, even though the specialty literature abounds in a plethora of interpretations, there's no universal standardized definition that might encompass all the dimensions of a smart city.[1] The European Commission describes the smart city as a site which prioritizes the wellbeing of its inhabitants and businesses, making

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[1] KUMAR, K. A. et al. Understanding Smart Cities: Inputs for Research and Practice. In: KUMAR, Kar A. et al. (eds.). *Advances in Smart Cities. Smarter People, Governance and Solutions*. Boca Raton: CRC Press Taylor & Francis, 2017, p. 2. PUŞCAŞU, B. *Mic Ghid pentru Oraşele care vor să Devină şi Mai Inteligente* [*Small Guide for those Cities who want to Become More*

traditional networks and services more efficient by exploiting the possibilities given by the digital and telecommunication technologies. The definition given by the Commission puts forward a holistic approach, as it tries to identify all the components of a smart city, which targets the better management of resources and the reduction of the carbon footprint. A smart city surpasses the traditional use of ICT, as it focuses on more efficient urban transport networks, upgraded water supply and waste disposal facilities. Furthermore, a capable and responsive city administration is an indispensable element of the smart city puzzle.[2] A similar interpretation could be seen in urban planner, Boyd Cohen's description of smart city, emphasizing the role of technology and innovation in the efficient use of resources and the reduction of carbon dioxide emissions. Nonetheless, he underlines that technology represents only one aspect of a smart city, namely cities won't become smart only because of technology, they will become smart due to the human agent, i.e., the people. He also expressed his doubts concerning the long-term endurance of the concept under scrutiny, forecasting the disappearance of the term 'smart city', being replaced by new concepts, such as *future city* or *innovative city*, however the essence will remain the same.[3]

One of the most renowned specialists in the field of regional sciences, Professor Rudolf Giffinger conditions the transformation of a normal urban settlement into a smart city, to excelling in six key features, which are "built on the 'smart' combination of endowments and activities of self-decisive, independent and aware citizens".[4] Economy, people, governance, mobility, environment and living were listed among the six traits that are indispensable to the establishment of a city with smart orientation. Inspired by Giffinger's ranking approach, climate strategist and smart city expert, Boyd Cohen developed the so called 'Smart Cities Wheel' remodelling Professor Giffinger's characteristics, singling out six indicators, such as smart people, smart economy, smart environment, smart government, smart living and smart mobility.[5]

Intelligent]. 2016, p. 1. [online]. Available at: <http://www.aapro.ro/doc/articole/2016-10-28/ghid-smart-cities-ro.pdf>

2   European Commission. *Smart Cities*. [online]. Available at: <https://ec.europa.eu/info/eu-regional-and-urban-development/topics/cities-and-urban-development/city-initiatives/smart-cities_en>

3   The City of Vienna. *And he Saw that it was "Smart" – Interview with Climate Strategist Boyd Cohen.* [online]. Available at: <https://www.wien.gv.at/english/transportation-urbanplanning/interview-boyd-cohen.html>

4   GIFFINGER, R.; HAINDLMAIER, G. Smart Cities Ranking: An Effective Instrument for the Positioning of the Cities. *Journal of the Centre of Land Policy and Valuations*, 2010, vol. 4, no. 12, p. 13.

5   Bee Smart City. Building the Smart City: Advancing in Six Fields of Action. [online]. Available at: <https://hub.beesmart.city/smart-city-indicators/> The City of Vienna. *And he Saw that it was "Smart".*

Including 'smart people' among the six key indicators shows that the strategy envisaging a smart type of conurbation is people oriented, as it focuses on aspects related to their everyday life, like education, learning or participation in public life. Furthermore, it intends to harness human potential and creativity, thus contributing to the creation of smart urban settlements. Accordingly, the continuous improvement of people's living conditions, quality of life, education and personality are quintessential for having smart residents in urban areas. Scoring high at the Human Development Index could be considered as one of the most important criterion in assessing the level of smartness. Additionally, a conurbation inhabited by smart citizens is knowledge driven, it is characterized by open-mindedness, flexibility and an insatiable thirst for continuous learning, and it cherishes a participative type of governance.[6]

Undoubtedly, high level of GDP per capita does not suffice for labelling a settlement a smart city. Other indicators, such as public expenses on education, research grants, research and development, average annual household income, unemployment rate, amount of projects funded by the civil society etc. are also imperative for a genuine assessment. A 'smart economy' is innovation driven, does not lack entrepreneurial spirit, and creates proper incentives for increasing productivity and for establishing a flexible labour market, and finally, it targets the securing of investments, jobs, businesses and talents.[7] In Cohen's conception, a smart city represents a proper milieu for the establishment and functioning of start-ups, and it also acts as a pull factor to investors, businesses and highly qualified talents and skilled workers.[8]

The third indicator, 'smart mobility' refers to the infrastructural facilities within an urban settlement which should be designed in such a way to facilitate the lives of residents.[9] Efficiency in the management of human mobility within a conurbation is of a pivotal importance, as it influences not only the internal, regional or international accessibility, but both public and private transportation to and from workplace, and implicitly also productivity. An intelligent transportation model is customer-centric and inclusive, and is committed to achieving

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[6] KUMAR, T. M. Smart City E-Governance: Issues and Future. In KUMAR, T. M. (ed.) *E-Governance for Smart Cities*. Springer, 2015, p. 357. KUMAR, K. A. et al. Understanding Smart Cities: Inputs for Research and Practice. In: KUMAR, Kar A. et al. (eds.). *Advances in Smart Cities. Smarter People, Governance and Solutions*. Boca Raton: CRC Press Taylor & Francis, 2017, p. 3. GUPTA, S., MUSTAFA, Z. S., KUMAR, H. Smart People for Smart Cities: A Behavioral Framework for Personality and Roles. In: KUMAR, Kar A. et al. (eds.) *Advances in Smart Cities. Smarter People, Governance, and Solutions*. Boca Raton: CRC Press Taylor & Francis, 2017, p. 5.

[7] KUMAR, K. A. et al. Understanding Smart Cities, 2017, p. 3.

[8] Bee Smart City. Building the Smart City; The City of Vienna. *And he Saw that it was "Smart"*.

[9] KUMAR, K. A. et al. Understanding Smart Cities, 2017, pp. 3–4.

a faster, cheaper and eco-friendly mobility for everyone, promoting the use of electric and hydrogen-powered vehicles, autonomous vehicles and the practice of bike/car sharing.[10]

Establishing a 'smart environment' is the key to a sustainable and liveable future, thus propelling decision-makers to adopt smart energy management schemes with low carbon logistics. The considerable reduction of the carbon-footprint and the achievement of a high energy-efficiency are the ultimate goals. This could be accomplished through: the reduction of greenhouse gas emissions, conservation of electricity, treatment and conservation of water resources, the management of green spaces, the use of renewable sources and efficient waste reduction and recycling practices etc.[11] The 'smart living' indicator prioritizes the well-being and commodity of residents, by focusing on areas of leisure for all age groups, starting with cinemas, public libraries, parks, green spaces etc. High quality healthcare, safety, housing conditions and intelligent buildings are also necessary for increasing liveability within a human settlement.[12]

'Smart government/governance' is vital, as smart orientation in a city cannot be fulfilled without a qualified, visionary and open-minded leadership. According to Vinod Kumar, smart governance has four building blocks, such as: participative decision-making (collaborative governance), transparency, best public and social services and adequate political strategies and perspectives.[13]Moreover, e-governance could also enhance the participation of citizens in public policy and urban governance, facilitating the dialogue between them and the decision-makers. In Albino, Berardi and Dangelico's point of view, the ICT-mediated governance, namely e-governance is essential for bringing the citizens closer to the decision-making process and for transparency.[14]

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[10]   Bee Smart City. Building the Smart City.

[11]   MUSTAFA, S. Z., KUMAR, K. A. Management of Multidimensional Risk for Digital Services in Smart Cities. In KUMAR, Kar, A. et al. (eds.) *Advances in Smart Cities. Smarter People, Governance and Solutions*. Boca Raton: CRC Press Taylor & Francis, 2017, p. 152. KUMAR, K. A. et al. Understanding Smart Cities, 2017, p. 5.

[12]   Bee Smart City. Building the Smart City.

[13]   VINOD KUMAR, T. M. E-Governance for Smart Cities. In VINOD KUMAR, T. M. (ed.) *E-Governance for Smart Cities*. Springer, 2015, p. 22; ANTHOPOULOS, L. G. *Understanding Smart Cities: A Tool for Smart Government or an Industrial Trick*, Springer, 2017, p. 267.

[14]   ALBINO, V., BERARDI, U., DANGELICO, R. M. Smart Cities: Definitions, Dimensions, Performance, and Initiatives. *Journal of Urban Technology*, vol. 22, no. 1, 2015, p. 12. IGI Global. *What is E-Governance?* [online]. Available at: <https://www.igi-global.com/dictionary/cyber-capability-framework/8702>

3.   Is there a causal nexus between the level of smartness in a city and the presence of start-ups? Case study: The city of Oradea

When discussing the particularities of the smart economy indicator, we have ascertained that a smart city represents a proper environment for start-ups, as it has the ability to attract investors, companies and high skilled professionals. Within the current study, we would like to prove the existence of a causal link between the level of smart orientation in a city and the spread of start-ups. Namely, the smarter the city, the bigger the number of start-ups, and vice versa. According to this rationale, start-ups could be considered as smart city indicators, showing the level of development and smart orientation within an urban settlement.

The great potential of SMEs in boosting economy was recognised by the European Union on a very early stage. The Small Business Act from 2008 elaborated under the Commission presidency of Jose Manuel Barrosso put forward a comprehensive policy framework for small and medium enterprises, acknowledging that the adoption of SME friendly regulations and environment will lead to a steady economic development. Furthermore, SMSs were labelled as the backbone of the European society, and EU member states were advised to simplify and ease the administrative burden on these businesses and to change the national legislation in matter.[15] As the start-up time and costs of setting up new enterprises was varying in every EU country, in May 2011, the Competitiveness Council requested the reduction of the average start-up time for new businesses to 3 days and of the capping of costs to 100 Euros by 2012. The Commission plays an important role in monitoring the progress from the member states concerning the development of start-ups and it is also charged with the elaboration of Progress reports on start-up procedures. The financial support provided by the EU for start-ups is also considerable, these enterprises being supported through the COSME (Competitiveness of Enterprises and Small and Medium-sized Enterprises) programme, Horizon 2002, the EEN (Enterprise Europe Network), the Digital agenda for Europe – startup Europe and even through assistance from the European Investment Bank Fund. These small and medium enterprises have also benefitted of structural funds, more than 70 billion Euros being spent on SMEs by the end of 2013. With this money more than 78.000 start-ups were funded and this led to the creation of over 268.000 steady jobs in EU member states.[16] The new Commissioner for Internal

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15   European Commission, *Putting Small Businesses First. Europe is Good for SMEs, SMSs are Good for Europe*, 2008, p. 1.

16   European Union Official Site, *Starting a Business*. [online]. Available at:<https://europa.eu/youreurope/business/running-business/start-ups/starting-business/index_en.htm>

Market, Thierry Breton, in March 2020 launched An SME Strategy for a Sustainable Digital Europe reiterating the salience of "Europe's 25 million small and medium enterprises", highlighting that these are indispensable for the economic development of the Community, as they are deeply woven in Europe's economic and social fabric. Attention is paid to the further reduction of regulatory burden and the improvement of market access and to more financing opportunities.[17]
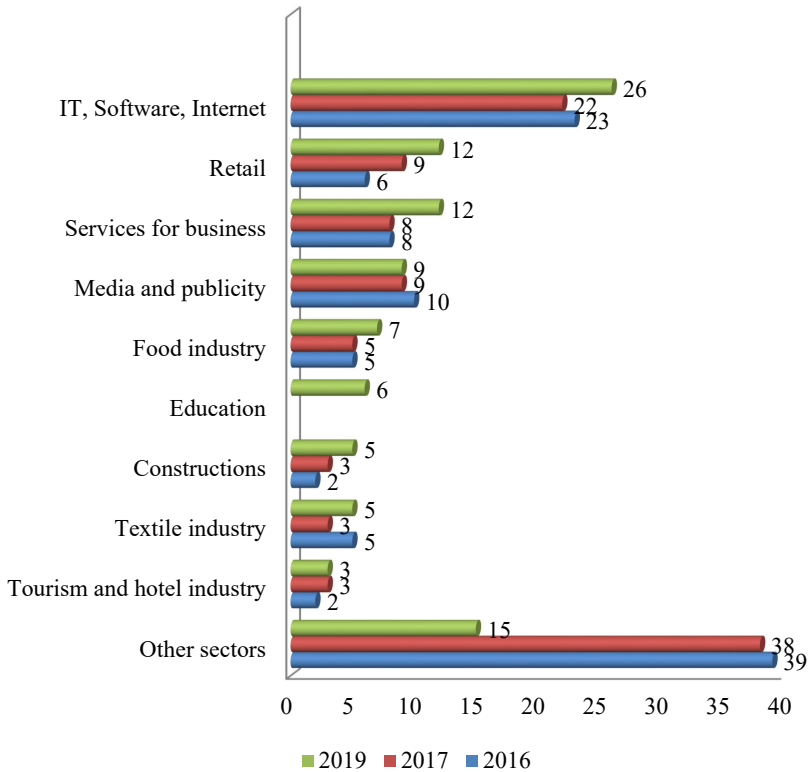
According to the *Start-up Business Barometer in Romania* for 2019, in the past years, could be detected a growing interest especially among young Romanians for the field of entrepreneurship. Of the 374 entrepreneurs who answered the questions of the Barometer, 82% run businesses with less than three years of experience and 92% confirmed that they are founders/shareholders in these companies. As similarly to the concept of the 'smart city', also coming with a universally accepted definition for start-ups is challenging, in this study we understand by start-ups, small and medium sized companies with less than three years of experience, the owners being founders /co-founders/ shareholders of the start-up.[18]The 2019 edition of the *Start-up Business Barometer in Romania* showed that at country level 1 out of 2 start-ups has been on the market for less than a year, this trend being maintained throughout the 3 editions of the study, since 2016. Unfortunately, about a third of start-ups fail to reach the second year of activity. Concerning their location, in Romania 87% of start-ups are set up in urban areas. However, 2019 saw an increase also in the rural areas (13% compared to 8% in 2016). On the other hand, compared to the previous years, in the capital city, Bucharest could be detected a sharp decrease in the number of new start-ups. If in 2016, 60% of the total numbers of start-ups from the country operated in Bucharest by 2019 it decreased to only 41 %. Concerning their field of activity, the number of start-ups increased slightly for IT, trade and B2B (business-to-business) services.[19]

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[17] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. An SME Strategy for a Sustainable and Digital Europe, COM(2020) 103 final

[18] EY Romania. *Barometrul afacerilor de tip startupdin România* [*Start-up Business Barometer in Romania*]. 2019, pp. 2-4. [Online]. Available at: <https://www.eyromania.ro/studii-and-articole/barometrul-afacerilor-de-tip-startup-din-romania-2019/> Financial Market, *Start-Up Romania 2018, E-book pentru Antreprenori sau viitori Antreprenori [Start-Up Romania 2018, E-book for Entrepreneurs or future Entrepreneurs]*, 2018, p. 7. [online]. Available at: <https://www.financialmarket.ro/wp-content/uploads/2018/02/Start-up-Nation-2018.pdf>

[19] EY Romania, 2019, p. 7.

**Chart 1.** Field of activity of start-ups in Romania in % 2016-2019

Own elaboration based on the data found in Start-up Business Barometer in Romania

As shown in Map no. 1, after the Bucuresti-Ilfov NUTS 2 level development region (with 17.039), the North-Western development region (where also Oradea is situated) has the highest number of start-ups, numbering 10.877 companies. This could be considered also as an efficient indicator in assessing the level of development within a specific region.

Map 1. Distribution by development regions of the number of newly established start-ups in Romania (Financial Market, 2019, p. 5)
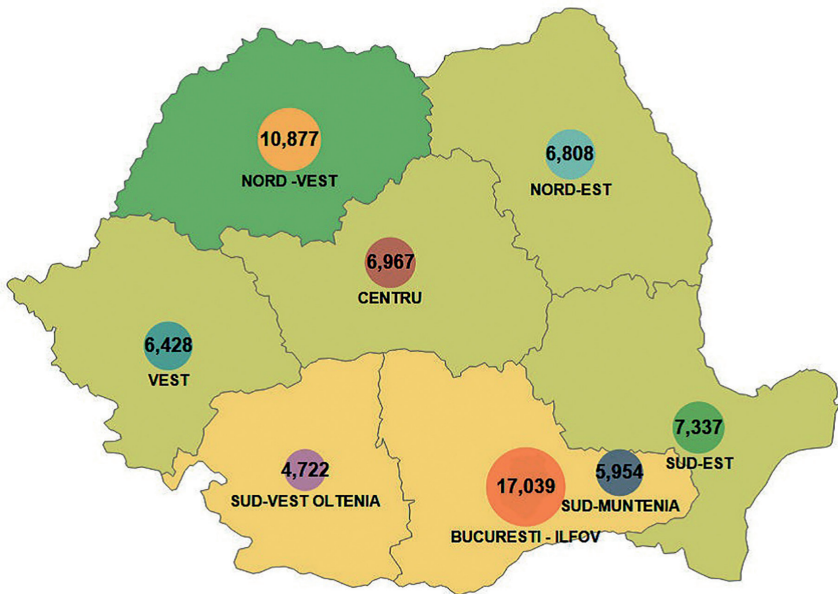
Looking at the range of services and products, 36% of start-ups in Romania offer their services and products exclusively for the local market, and 34% for the national market. Only 10% target regional/European markets and consumers and 20% have a global outreach, however, 50% of the interviewees in 2019 were planning to enter new geographic markets, mainly in Europe and the USA. Assessing the level of financing, personal funds remain the main source of funding for more than three quarters of start-ups (79%). At the same time, there is a significant increase in the share of state funding, financial assistance received from family and friends, but also from business angels. In 2019, 11% of the financial assistance for the setup of start-ups originated from EU Funds, while 16% was non-reimbursable financing from the Romanian state or other institutions.[20]

The Romanian government has also the acknowledged the great potential of start-ups and in the past years it has been actively engaged in developing various financial schemes and programmes facilitating the establishment of such companies. One of the most prominent governmental programmes is the *Start-Up Nation*. Start-Up Nation Romania is a funding program that aims to support the

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[20] ibid., pp. 8–10, 24–25.

creation of new small and medium-sized enterprises, with non-reimbursable funds from the state budget. Under this programme, entrepreneurs can benefit from a financial assistance, maximum 100% of the value of the non-reimbursable financial allowance but not more than 200,000 Romanian Lei, including VAT for non-paying companies. Vans, equipment, machinery, computers, furniture, website, software licenses, courses, consulting, purchasing work spaces are only a few of the eligible expenses under this financial scheme.[21]

With regard to our case study, the city of Oradea, after a thorough analysis of its situational picture in terms of start-ups, we came to the conclusion that Oradea hasn't reached its full capacity yet. Within the current research we aim at briefly presenting 9 start-ups, the vast majority of them operating in the IT, software and e-commerce sector. FieldVibe is a start-up from Oradea, specialized in assisting small home service companies to schedule their daily jobs, manage their field employees, boost productivity, and increase customer satisfaction with the help of automated text reminders. Relevon is an e-commerce and customer retention platform created for digital agencies. Prime Dash is developing financial software for automated financial decision-making. Another start-up, Octavic is aimed at providing flexible Industry 4.0 solutions for manufacturing challenges. Even though the number of start-ups in Oradea is not so considerable, the services they provide are upbeat and versatile, and definitely keep pace with the high tech demands of the regional/global market. A very good example of this constitutes TypingDNA, which uses artificial intelligence to identify and authenticate people based on typing biometrics (the way people type on their keyboard). In 2019, TypingDNA was selected in the top 50 of the most innovative start-ups from Europe.[22]With the help of a process engine, a young enterprise called Finboard, enables the transformation of accounting data into strategic and financial management information.[23] Paymo is targeting Small-Medium Businesses/Enterprises specialized in web design & development, advertising/PR, architectural services, education and non-profits, offering them a cloud project management application that piles up different duties from task management, time tracking to invoicing. Axosuits is a robotic company, designed to develop high-powered multi-purpose exoskeletons. One of the first start-ups from Oradea,

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[21] Start-Up Nation Romania, [online]. Available at: <https://start-upnation.ro/?gclid=EAIaIQobC hMI5s223vLC6QIVg53VCh1E_wbxEAAYAyAAEgKI9fD_BwE>

[22] FLORIAN, S. *10 Romanian Startups to Look out for in 2019 and Beyond, EU-Startups*. 2019. [online]. Available at: <https://www.eu-startups.com/2019/05/10-romanian-startups-to-look -out-for-in-2019-and-beyond/> Bursa Construcțiilor, *Municipiul Oradea face paşi către "smart city"[The Municipality of Oradea makes steps towards a smart city].* 2018. [online]. Available at: <https://www.constructiibursa.ro/municipiul-oradea-face-pasi-catre-smart-city--8522829>

[23] RomanianStartups. [online]. Available at: <https://www.romanianstartups.com/search/?ls=oradea>

receiving funding from the Startup Nation Romania programme has lived up to the expectations of its founders, and became a profitable business. Watch Straps by Uglai (Atelierul Uglai) is specialized in producing personalized watch straps, designed and handmade from natural leather.[24]

4. Smart city orientation in Oradea and the importance of collaborative governance

When assessing the building blocks of a smart city, we have highlighted the importance of collaborative governance. The Encyclopaedia of Governance describes *collaborative governance* as a form of decision-making where the government includes "its citizens, social organizations, enterprises, and other stakeholders in the early stages of the policy-making process."[25]Namely, in contrast with the traditional public policy procedures, where citizens and other stakeholders are not involved in the decision-making process, receiving only the final proposal, a collaborative type of governance promoted within a smart city favours participative governance. In this form of policy-making the input of the citizens and stakeholders is valuable, the elaborated policies being the outcome of a broad consensus between the central leadership, the citizens and various stakeholders. As highlighted in the academic literature, a smart government is required to create collaborative environments and to foster cooperation among all parties involved in policy-making. ICT is an efficient tool in increasing public participation (e-participation) in decision-making, which facilitates public involvement, enhances the abilities of citizens, the level of democracy and the rate of acceptability of administrative decisions.[26]

When analyzing the governance model implemented in the city of Oradea, we could ascertain that the central leadership favours a collaborative type of governance, involving more and more the citizens and various stakeholders in the important policy decisions meant to transform Oradea into a smart urban settlement. The 2018 edition of the Smart City Radiography in Romania ranked

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[24] NITU, F. Afaceri de la zero. Familia Uglai produce curele de ceas din piele naturală, hand-made, într-un atelier din Oradea, pe care le vinde în România și în străinătate [Business from scratch. The Uglai family produces hand-made natural leather watch straps in a workshop in Oradea, which they sell in Romania and abroad], In *Ziarul Financiar*. 2019. [online]. Available at: <https://www.zf.ro/afaceri-de-la-zero/afaceri-de-la-zero-familia-uglai-produce-curele-de-ceas-din-piele-naturala-hand-made-intr-un-atelier-din-oradea-pe-care-le-vinde-in-romania-si-in-strainatate-18228637>

[25] BEVIR, M. (ed.). *Encyclopaedia of Governance*. London: Sage Publications, 2007, p. 104.

[26] VIALE PEREIRA, G., PARYCEK, P., FALCO, E., KLEINHANS, R. Smart Governance in the Context of Smart Cities: A Literature Review. *Information Polity*, vol. 23, no. 2, 2018, p. 155.

Oradea as the city with the highest administrative efficiency out of the 320 cities and towns from Romania. Oradea has also the best performance in terms of capital expenditures, with investments of 1225 Euro per capita in the last 8 years and with an attraction of European funds of 716 Euro per capita. Moreover, with 20 developed projects, Oradea has successfully entered the smart city race, alongside bigger urban centres, such as Bucharest, Cluj-Napoca, Timișoara, Constanța and Iași.[27]Accordingly, Oradea is a leader in smart governance and also in smart mobility, in 2019 developing 6 smart mobility projects. Oradea also has intelligent parking places, free wi-fi in public places and e-governance etc.[28]

In July 2015 was launched at the City Hall an ambitious project called "Computerization strategy of the Municipality of Oradea 2016-2025", targeting the elaboration of the integrated computerization strategy of the Municipality of Oradea, by describing the stages and procedures necessary to transform Oradea into a genuine "Smart City"[29] In December 2015 the Municipality of Oradea defined its development priorities for the 2014-2020 period within the Local Development Strategy, also sharing its vision for 2020. The municipality prioritizes the computerization process in the city, focusing on:

- Supporting the development of the IT sector at local level – Oradea IT Hub (ex. Oradea Tech Hub initiative);
- Turning into one of the best providers of quality public services in Romania (relationship with citizens, business, tourists and potential investors, especially in the areas of health, public transport and public utilities);
- Becoming an attractive tourist city by creating a strong brand and by creating intuitive and related products and services in the field of computerization (Oradea City Card and correlation with e-ticketing for metropolitan public transport);
- Maintaining the pace of attracting European investment funds;[30]

The Municipality acknowledged that in order to reach the desired outcome, namely turning the city into a smart and sustainable settlement, the Computerization

27 Vegacomp Consulting. *Radiografia Smart City Oradea. Raport Pilot [Smart City Radiography in Romania. Pilot Report]*. 2018, pp. 3-5. [online]. Available at: <https://vegacomp.ro/wpr/wp -content/uploads/2018/03/radiografia-smart-city_2018.03.14.pdf>

28 Vegacomp Consulting. *Radiografia Smart City Oradea. De la Smart City 0.1, la Smart City 1.0 [Smart City Radiography in Romania. From Smart City 0.1 to Smart City 1.0]*. 2019, p. 7. [online]. Available at: <https://vegacomp.ro/wpr/wp-content/uploads/2019/03/radiografie-sma rt-city-romania-martie-2019-final.pdf>

29 Primăria Oradea. *Synthesis of the Press Conference: Launch of the project: Computerization Strategy of Oradea Municipality 2016-2025*, 2015. [online]. Available at: <http://www.oradea .ro/stiri-oradea/primaria-oradea-inten-539-ioneaza-sa-elaboreze-o-strategie-integrata-de-inform atizare-a-municipiului>

30 Primăria Oradea. *Specifications for the Integrated Computerization Strategy of the Municipality of Oradea 2015–2025*, 2015, p. 1. [online]. Available at: <http://www.oradea.ro/stiri-oradea/primaria- oradea-inten-539-ioneaza-sa-elaboreze-o-strategie-integrata-de-informatizare-a-municipiului>

Strategy of Oradea must adopt a holistic approach, covering all the necessary elements of a smart conurbation, from the technological and human to the institutional ones. The viewpoints enumerated in the strategy prove the validity of our hypotheses, which claim the existence of a citizen-centred, participative governance model in the city. First of all, the city management is aimed at providing the inhabitants high quality public services, "in which all projects undertaken by the administration will have a single focal point – the CITIZEN – resulting in higher living and operational standards for citizens and businesses, new employment opportunities through a more innovative entrepreneurial ecosystem, of increased ecological sustainability"[31] Secondly, within the document is highlighted, that the 'metamorphosis' of Oradea into an intelligent urban centre is possible only through a permanent dialogue with the civil society and their active involvement in the decision-making and implementation process.

Among the smart projects launched in Oradea we find:[32]

- Underground sewage- municipality property
- Video surveillance system and fiber optic network of the Municipality
- Water Company – partial telecitation system
- Heating Company Oradea – Integrated computer system for reading and managing meters in the city Oradea and the neighbouring Sânmartin locality
- Oradea Local Transport – vehicles with GPS, citizen information panels, e-ticketing
- The development on the city hall portal of a platform for the online purchase of parking subscriptions, including the notification of the holders of subscriptions by SMS and e-mail before the expiration of the subscription validity;
- The development of apps such as- Mobile Pay, Amparcat.ro, TelPark, Oradea City Report and Oradea City App
- Online payments of taxes and fees, payment of parking and local transport tickets via SMS (also sending SMS to citizens who have to pick up or complete the submitted documentation); electronic system for issuing serial numbers in the management of citizen flows within the Counters Hall)
- Oradea City Report – application for mobile devices to take citizens' complaints
- Tourist information system through applications for mobile devices
- Replacement of classic luminaries with LED ones, to reduce energy consumption

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[31] Ibid., p. 4.
[32] Bursa Construcțiilor. *Municipiul Oradea face pași către "smart city"* [*The Municipality of Oradea makes steps towards a smart city*]. 2018. [online]. Available at: <https://www.constructiibursa.ro /municipiul-oradea-face-pasi-catre-smart-city--8522829> Oradea Smart City Brochure. [online]. Available at: <http://www.oradea.ro/fisiere/module_fisiere/24628/PREZENTARE%20-%20bro sura.pdf>

Figure 2. Smart strategy of the Municipality of Oradea (Own elaboration based on Oradea Smart City Brochure)
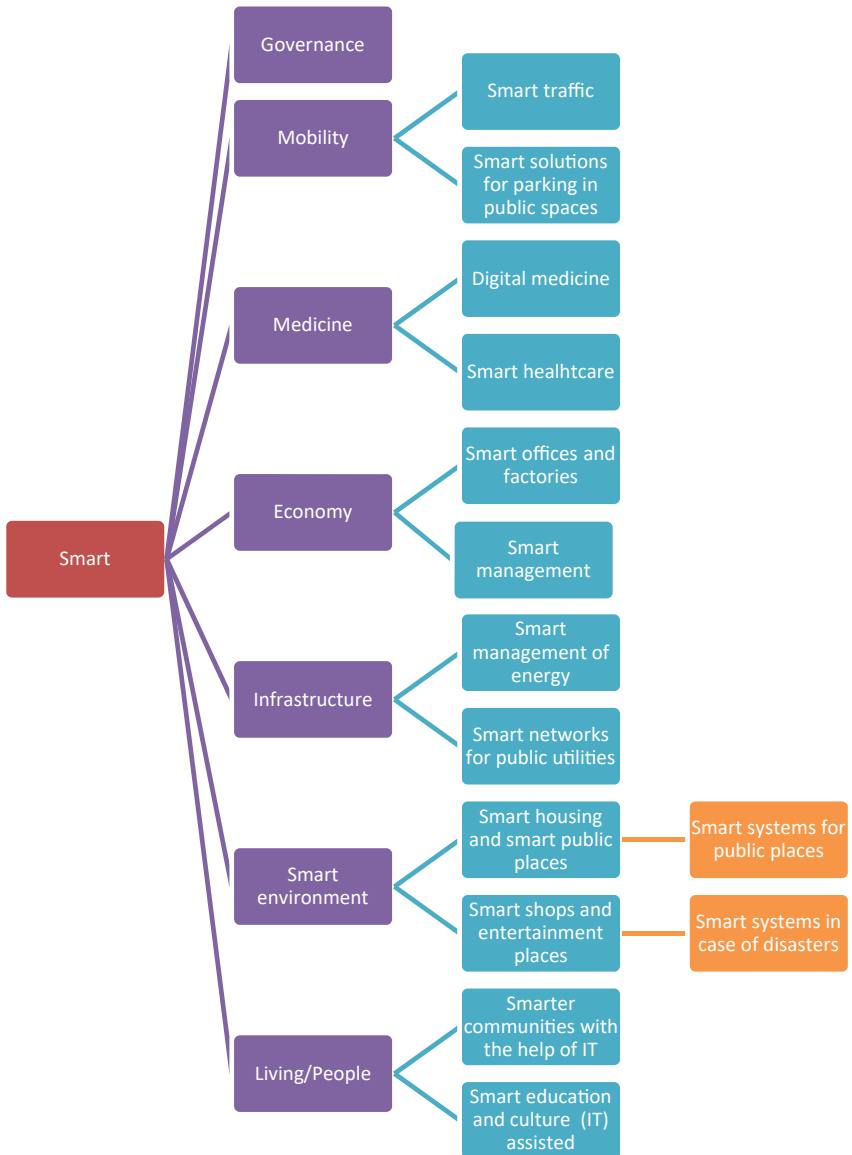
5.   Closing remarks

As it was mentioned before, the current study put forward a dual objective, endeavouring to demonstrate the existence of a causal link between the level of smart orientation in a city and the spread of start-ups, choosing our home town, Oradea as the case study. Secondly, it argued that embracing of a participative governance model by the city leadership, enables smart orientation within a city. Assessing the situational picture of the city in terms of start-ups revealed to us that although the number of start-ups in Oradea is not that considerable compared to other cities, like Bucharest or Cluj-Napoca, lately it has registered a growing trend. Furthermore, the services provided by these start-ups are versatile and they have proven that they can keep up even with the high demands of the international market. One example in this case constitutes TypingDNA. As the services offered by the company have proven their worth in the field of cybersecurity, in 2020 the company received a funding of 7 million dollars from foreign funding programmes. Typing DNA was also selected in the TOP50 of the European Start-ups.[33] On the other hand, when analyzing the governance model favoured by the municipality, we have asserted the existence of a constant desire to engage citizens and other stakeholders in the process of elaborating and implementing public policies. This type of collaborative governance coupled with a qualified and visionary leadership contribute to the transformation of Oradea, from an average urban settlement into a city with smart orientation. The multitude of implemented projects, together with the new initiatives is the living proof of a genuine commitment from both the management and the civil society towards a smart path, which, as in case of other megacities won't be a commodity choice in the future, but the only option for survival.

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