Original scientific paper

APPLICATION OF THE SMART CITY CONCEPT IN PROCESS OF URBAN RECYCLING – CASE STUDY OF ŠPITÁLKA IN BRNO, CZECH REPUBLIC

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Abstract

Today's society is increasingly fascinated by new smart technologies, and the concept of smart cities is reflected in urban planning both in the rich cities of the developed world and in the cities of the former post-socialist countries. The paper, which is methodologically based on results of qualitative interviews with key experts and analysis of available data and information, pay attention to the challenges that are connected with application of the concept of smart cities in post-socialistic urban space. We use the case of Špitálka project, located in Brno, the Czech Republic to show, how difficult is the transformation of a concrete urban neighbourhood with the occurrence of brownfields to the new smart urban area, which can be used as a model for other Czech cities. The results illustrate how for the post-socialistic space is important networking, active participation of stakeholders and the transfer of foreign experiences from other European countries.,

Keywords: Smart City, brownfields, urban development, post-socialism, Czech Republic

INTRODUCTION

During 19th century and nine decades of 20th century, the urban development on the territory of the Czech Republic was strongly influenced by the process of industrialization and majority of Czech cities and towns have a strong and long term industrial tradition related to the different industrial branches (Rumpel, Slach & Koutský, 2010). After the return of the market economy in the period after 1989, there was a strong process of deindustrialization that caused among the other things the existence of many urban brownfields. Their regeneration is an extremely difficult task, especially in the cities with declining of heavy industries (Duží & Jakubínský, 2013; Martinát et al., 2016). The previous research activities show that for successful regeneration the active participation of the different groups of actors and involvement of public administration in brownfields regeneration projects is important (Klusáček et al., 2018). Therefore there were developed the different specialized tools to support decisions of

stakeholders involved in the process of new re-development (e.g. Bartke et al., 2016; Limasset et al., 2018; Pizzol et al., 2016).

In the Czech Republic, Brno is one of the most active cities in brownfield redevelopment (Klusáček et al., 2018), and municipal self-government created and manage the detailed database of urban brownfields, which was explored in detail from spatial perspective by Frantál et al. (2015a). Regeneration of brownfields in Brno targets to a wide range of functional re-use (especially services) using a variety of approaches. During some regeneration projects, in which Brno City is the owner of the brownfield areas, Brno tries to implement innovative and new solutions as in case of the former prison, which is planned to be used for the development of the creative industries (Alexandrescu et al., 2020). One of the other important brownfields sites with innovative potential is Špitálka (City of Brno, 2020), where Brno is planning the implementation of Smart City concept and creation of a smart urban district. Successful regeneration of this locality should be used as an example of good practice for other locations in the Czech Republic. This paper deals with the issue of implementation of the concept of smart cities during regeneration of brownfields in post-socialistic urban areas. The main objective of this paper is to identify the main factors affecting the successful implementation of the smart city concept during the process of brownfields regeneration in the post-socialistic urban environment.

THEORETICAL BACKGROUND

In the last 20 years, the concept of a smart city has become important for urban development planning because technological progress is rapidly occurring and because the challenges facing local authorities regarding the resolution of climatic, energy, and urbanization problems are increasing (Sikora-Fernandez, 2018). Transforming urban areas into prosperous, livable, and sustainable settlements is a longstanding goal for local governments, and countless urban settlements across the globe have jumped into the so-called 'smart city' bandwagon to achieve this goal (Yigitcanlar et al., 2019). The concept of smart cities presents themselves as a viable solution to aggregate public resources, human capital, social capital and information, and communication technologies to promote sustainable development (de Guimarães et al., 2020). The issues related to the smart cities are discussed with the different perspectives both in the non-European countries (e.g., Lu, de Jong, & ten Heuvelhof, 2018; Praharaj & Han, 2019; Lam & Yang, 2020) and also in European countries (e.g. Fernandez-Anez, Fernández-Güell, &

Giffinger, 2018; Nick, Pongrácz & Radács, 2018; Akande et al., 2019; Hýllová & Slach, 2019; Simonofski et al., 2019).

Concept of smart cities also influenced the process of regeneration of urban brownfields and recycling of the previously develop urban lands. Mechanism of smart sustainable urban regeneration involves local engagement, institutional strengthening, tight project screening and innovative regenerative funding and its outcome are inclusive, measured, and coordinated transformations, which 'sweat' existing assets, counter the long-tail of educational failure, and catalyse productive local innovation (Huston, Rahimzad, & Parsa, 2015). However, many different factors are influencing the successful regeneration of brownfields in a post-socialistic space (Osman et al., 2015). It is necessary to presuppose that implementation of the concept of Smart Cities at the regeneration of urban brownfields in the post-socialistic environment is a quite challenging task.

Leaving aside spatial factors like proximity of railway, level of contamination, or commercial potential (Osman et al., 2015), we would like to highlight the importance of public (community) participation, networking, and sharing of experiences in brownfield revitalization in the lens of smart city concept. If the elements of some development concept (for example, smart city) are to be successfully implemented in urban reality, local citizens must accept them (Bryson et al., 2013). This is best achieved by engaging the community into the process of revitalization (Thorton et al., 2007). Based on the published studies (Boonstra & Boelens, 2011; Frantál et al., 2015b; Klusáček et al., 2018), broad cooperation of a diverse range of actors can mean creating a functioning local network that has the potential to affect the rate of regeneration and acceptance by residents. Since Brno could be seen as one of the pioneer cities in post-socialist countries, it is advisable to minimize the inexperience of learning from cities that have already undertaken similar projects (Alexandrescu et al., 2017; Gere, 2018).

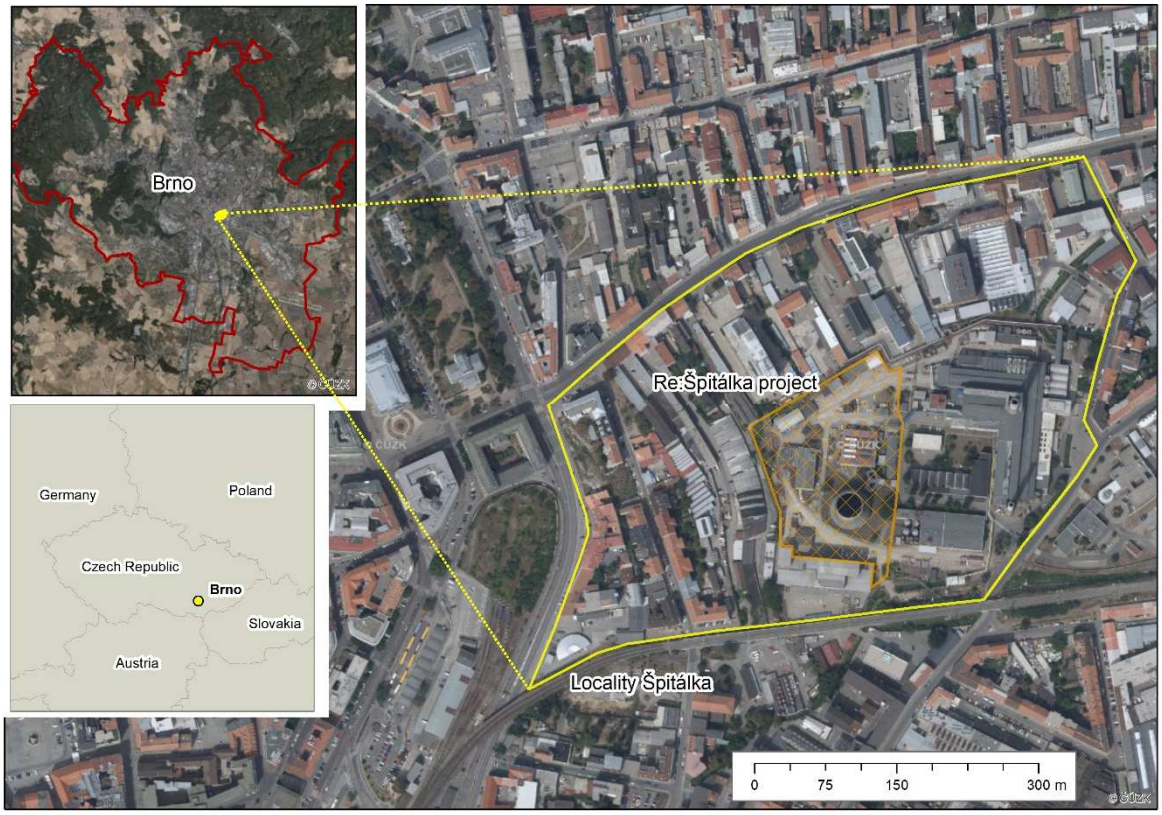
The first research question is focused on the identification of the factors that determine the successful implementation of the smart city concept during the process of brownfields regeneration in the conditions of the post-socialistic urban environment. The second research question concerns transfer of foreign experiences - what types of foreign good practice examples are most attractive to Czech stakeholders, and for what reasons?

CASE STUDY AREA, DATA AND METHODS OF THE RESEARCH ACTIVITIES

The case study area Špitálka (Figure 1), which is formed by the dilapidated buildings of local brownfield sites (Figure 2), is directly linked to the historical centre of the Brno city. It is an

area with a high build-up density and a closed block structure. Former production areas, which were the industrial centre of the city, are localized in this locality. Brno is preparing its innovative regeneration – as a part of city development document called Strategy Brno 2050 (City of Brno, 2019). The ambitious vision is that the smart district at Špitálka will serve as a pilot neighbourhood for verifying the objectives set in a closer horizon than 2050 so that the individual measures implemented can be evaluated and potentially further expanded to other areas of the city (City of Brno, 2020). The first phase of the regeneration process will be focused on the western part of the area occupied by the district heating plant Teplárny Brno (Figure 3), which is currently not used. Therefore the city of Brno is interested in using this site for the future construction of a so-called smart district RE:Špitálka, and temporarily makes this site accessible for further development activities of the city (ibid).

Figure 1 Location of the case study area Špitálka in the central part of Brno



Source: Authors' own processing

Figure 2 An example of the neglected and the dilapidated building of industrial brownfield at Špitálka Street in Brno

Source: P. Klusáček (2020)

Figure 3 Area of heating plant Brno from Špitálka Street

Source: P. Klusáček (2020)

The methodology is based not only on the analyses of available information and data related to the case study area Špitálka in Brno, which were prepared in connection with regeneration project, and which are available at Internet pages of the project (City of Brno, 2020). It is especially based on analyses of the information from six interviews, which were conducted in the period from January to April in 2019. The interviewed communication partners represent different actors involved in the revitalization project from the private and the public sector (Table 1) and all of them achieved university education. All interviews were conducted with the physical participation of both parties. Interviews were recorded, which was communicated to the communication partners beforehand, and everyone of them agreed to be recorded. The interviews were subsequently rewritten, and their transcripts were analysed using the Atlas.ti software.

Table 1 Basic characteristics of communication partners

Communication partners	**Gender**	**Education**	**Age category**	**Position**
No. 1	Male	Construction engineer	35 – 40 years	Developer in a private company
No. 2	Female	Architect	25 – 30 years	Architect in a private company
No. 3	Female	Economist	40 – 45 years	Ministry of Regional Development CZ - Department of Regional Agendas and Municipal Support
No. 4	Male	Geographer	45 – 50 years	the Ministry of Regional Development CZ – Department of Urban Development
No. 5	Male	Evaluation specialist	35 – 40 let	A representative of Brno local self-government
No. 6	Female	Sociologist	40 – 45 let	A representative of Brno local self-government

Source: Authors' own processing

ŠPITÁLKA PILOT PROJECT - CURRENT STATE

Špitálka pilot project is a part of the smart city project RUGGEDISED (funded under the European Union's Horizon 2020 research and innovation programme). It brings together three lighthouse cities (Rotterdam, Glasgow, and Umeå) and three follower cities: (Brno, Gdansk, and Parma) to test, implement and accelerate the smart city model across Europe (Ruggedised, 2020). The cooperation of six cities is focused on demonstrating how to combine ICT, e-mobility, and energy solutions to design smart, resilient cities for all. The lighthouse cities pay

attention to the development of smart solutions, and follower cities (including Brno) deal with the replication projects (ibid).

Brno City selected for pilot project Špitálka locality, which is at present the part of the city with the occurrence of many disused factory premises, garages, and rundown public areas (City of Brno, 2020). The Smart City Brno Concept was approved by Brno City Council in October 2015, and the motto is that Brno is "a city which cleverly, sensibly and effectively uses modern technology and approaches, leading to an improvement in the quality of life, supporting effective governance, preserving natural resources, and enhancing energy sustainability" (Ruggedised, 2020). From a spatial perspective, Brno City has to deal with three main spatial concentrations of brownfields (Frantál et al., 2015a). The most difficult challenges are related to the brownfields, which are located in the proximity of Brno main railway station as they are located to the historical core of the city. The development issues as the relocation of the main railway station belong to the politically extremely difficult issues at the municipal and regional level (Durnová, 2018). Brno city tries to implement the different innovative solutions and locality of the former prison in Brno Cejl, which is located in the proximity of Špitálky. It is planned to be regenerated by using of creative city concept (Alexandrescu et al., 2020). From this perspective, RE:špitálka is another redevelopment project, which is trying to test and to implement western experiences and concepts for the regeneration of the post-socialistic urban space.

Concerning to the innovation issues, the Špitálka project pays attention to the different areas of innovations (Table 2). Implementing innovative technological solutions (energy, transport, information technology, waste) is an important aspect of the transformation of this urban location. Still, the project focuses on social innovation, both within the functioning of public space and the local community. The project assumes that future construction must be as efficient as possible from the point of view of energy. They want to implement measures that cover both the energy consumed for the running of buildings (heating, cooling, ventilation, and hot water preparation) as well as for their electrical power supply. Transport in locality Špitálka is a big issue due to a large number of vehicles in the city. The road capacity is often utilized to the full extent. The number of problematic situations can be reduced by using an appropriate combination of modern vehicle identification methods and tools for the computer-based prediction of their movement. Intelligent traffic management is an indispensable part of the smart city concept. In the locality, it is planned to test measures such as the Internet of Things (IoT), big data technology, wireless sensor networks (WSN), mobile applications, and similar

concepts. The project understands that the very important part of a smart city is the existence and development of large, robust, and scalable infrastructure of information and communication technologies. In order for all technological innovations to be fully applied, innovative life-oriented approaches must compliment them appropriately. Therefore, the project also focuses on community gardens, public workshops and share rental of things, innovative forms of ownership of apartment buildings such as cooperative housing, baugruppe (building groups), etc. will be encouraged as well.

From a time perspective, there were different preparation steps of Re:Špitálka project. In 2018 and 2019, there were organized international students competitions, and their analysis (Danko et al., 2019; Aulík et al. 2018; Kuklová et al., 2018; Maloň et al., 2018) are publicly available in the Czech language as part of dissemination materials for local stakeholders. In the years 2018 and 2019, there was also organized an international open Urban design idea competition, and the proposals were created and submitted by architects from the different countries including Belgium, Czech Republic, Japan, Lithuania, Poland, Serbia, Singapore, Slovakia and United Kingdom (Brno City Chief Architects Office, 2019). The previous studies (e.g., Frantál et al., 2015b; Klusáček et al., 2018) show that active participation of different groups of actors is very important for successful brownfields regeneration or for transferring of applicable knowledge related to recycling of previously developing lands (Alexandrescu et al., 2017). However, Špitálka project is not only about brownfields regeneration, because it is not focused on classical re-development of the abandoned urban areas but the project has ambitions to achieve the new smart quality of life in the future smart urban district. That is why the project leaders do not only speak about rebuilding, but they also use the other terms as redesign, reuse, resource, resilience, responsibility, and responsive (City of Brno, 2020). For the future implementation of the Smart Quarter project Špitálka in Brno, it could be important that the project has the political support of the Government of the Czech Republic – it makes a part of the so-called National Investment Plan of the Czech Republic for the period 2020 – 2050 (the Office of the Government of the Czech Republic, 2019). It will be crucial for the future success of the Špitálka project that there is a prospective political support at all three levels of public administration (central, regional, and municipal). Yet, this support should be stable over the different electoral cycles governing changings of democratic governments.

Table 2: Basic characteristics of applied area of innovation in RE:špitálka

Area of innovation	Field of innovation	Subtopics	Aims
Technology	Energy	- electrical grid thermal grid - intelligent led street lights - energy management and standards - battery storage	- to minimize the demands on the use of energy resources, - reducing the negative impacts of their use on the environment.
	Transport	- smart parking system, - traffic intensity data	- to optimise vehicle motion control concerning the achievement of the highest road passability.
	Wastes	- smart waste management, - vacuum system for municipal waste collection	- to reduce waste production, - start sustainable waste management and the efficient collection and production of secondary raw materials.
	Data and communication	- monitoring of operations and safety by drones, - intelligent building - control and end-user involvement	- to ensure the security and privacy of people in the hand of the interpretation and collection of large amounts of data but also the participatory part of the city management and administration
Community	Public space and green	- efficient use of rainwater, - green roofs, - community gardening	- encourage people to spend a substantial part of their leisure time in the locality and not only serve as space inside which people have to move between works, home or shops.
	People and community	- marketspace, - sharing store, - collective housing models	- to create opportunities for local people get involved in community life.

Source: Information - City of Brno (2020), table - own processing

SMART CITY CONCEPT PERCEPTION OF SELECTED ACTORS IN BRNO

Smart city is not only about technologies, but…

Interviews, which examined attitudes and opinions of communication partners on the studied concept, identified interesting differences in the approaches of individual actors. The communication partners agreed on some keywords, and Fig. 4 shows their hierarchy and frequency. From the perspective of frequency, it is interesting that keywords representing a technical side of the concept had higher frequency (e.g., technologies – frequency 35, energy – 22) in comparison to the keywords related to planning issues (development – 22, planning – 13) or environmental problems (environment – 11). This shows that the concept of smart cities

is still perceived in the post-socialist urban space, especially in connection with the introduction of new smart technologies.

Figure 4: Keywords used by communication partners during interviews focused on the implementation of the concept of smart cities in Brno

Term	Frequency
smart	75
city	69
project	51
Brno	42
people	37
technolog	35
house	33
example	27
energy	22
concept	21
area	18
development	17
building	16
public	15
planning	13
environment	11
change	10
methodology	10
abroad	8
money	8
space	7
finance	6
risk	4
regulation	2
target group	2

Source: Authors' processing

Some actors emphasize the position of technologies in the concept of Smart City, and it can be documented by the statement, that: "*Smart City is about implications of smart technologies. Whether it's housing or office space, today there are certain standards that guarantee energy savings. This means that the houses are self-sufficient so that they do not waste energy unnecessarily…(construction engineer)*". Other actors understand the concept of Smart City in a wider way as the process of introducing innovative measures and approaches to city administration and development, which should primarily make people's lives easier. They think that the application of the concept is "*not primarily about the use of state-of-the-art technologies, but about the rational use of existing technologies and approaches if their implementation saves time, people, the environment, etc.…(evaluation specialist)".*

The role of technologies is often emphasized in connection with the energy savings, improvements of urban transport, or as part of adaptation measures on the impacts of climate changes in cities (e. g. green roofs). This can be illustrated by a statement *"...a house is an envelope that saves energy, heat, and we apply different technologies to improve efficiency. For example, heat recovery, where we dissipate heat from people and computers to heat garages, for example. In my opinion, Smart housing as part of the smart city concept is housing that not only saves the environment, but is also functional for the users of the house(construction*

engineer). Other actors emphasize that using of smart technologies can bring both economic and environmental benefits and recommend that "*Brno city should focus on the application of these Smart technologies, because the city owns a lot of buildings, lots of schools ... In terms of energy savings and then ideally reinvest the saved money in school, that is actually the approach implemented by EPC - energy performance concept (geographer)".* But new smart technologies and solutions can also bring many positive effects on the social policy, because, for example, "*alone people can be successfully monitored using smart technologies (sociologist)".*

Application of new technologies and whole concept requires financial investments, which was commended in the way that "*creation of Smart City districts is also about money…If someone wants the Smart City, then it goes, then, of course, looking for the financial sources(economist)".* From the perspective of availability of the financial sources, it is important that it is one of the economically prosperous cities, which does not have problems of shrinking cities facing population decline end economic decrease (Martinát et al., 2016).

The communication partners emphasized the concrete smart projects must be tailored according to the financial situation of the end-users. It is typical that "*at the beginning of the project, it is common for most clients to have more requirements that do not meet their financial possibilities. ... this will be adjusted as a part of the architectonical study ... their requirements will be adjusted to finance, sometimes only finance, but mostly both (architect)".* Financing a concrete project driven by the private sector depends on the availability of loans because at the beginning of the creation of new smart neighbourhoods *the developer has land that he paid for his money. He does a project, collects permission, builds, and if there are flats that go on sale, of course, people take mortgages ..... This is how the private sector finances it (construction engineer)".*

The communication partners pointed out a certain fashion of the concept, which is reflected both in the level of city development management and also on the level of the need and demand of the inhabitants. In the case of urban development, we can document it by words of the economist, who said that *"...at the moment there is the trend of the word "smart" that the cities want to implement it. It is more or less related to the fact that the development is going on, and they are going smart."* From the urban inhabitants' perspectives, they can press on developers who participate in urban recycling, because they want to have *"super, happy, green zones (construction engineer)".* As he added, "*today everyone wants to live in a little virtual reality. We are trying to change something a little, add, and upgrade those technologies (construction engineer)".*

Space for participation of inhabitants

Another important issue, which was discussed during interviews with the communication partners, is the participation of actors at the planning of the smart cities project. Brno City is trying to improve the current situation by the involvement of various innovative measures as a division of city territory to the special parking zones or by the support of bike-sharing system. The communication partners emphasized that the concept must be conceived beyond the technology and associated with involving the city's residents and actors in decision-making processes regarding the use of the environment in which they live.

The inclusion of the widest possible range of relevant partners in the planning and development process is understood as proof that urban planners are not afraid to try new and innovative approaches to project implementation when the smart city concept is applied. The notion of living labs approach was mentioned, as one of the partners stated: *"different cities have experiences with this approach and are not afraid to experiment and to create the pilot smart neighbourhoods, so-called living labs, to test the effectiveness of new technologies and approaches. (evaluation specialists)"*.

During interviews, we have also discussed the issues related to smart urban planning for 21st century, which should leave the urbanisms of 20th century with its functional zones, and which could support the connection of the public space with the private residential environment. One of the important objectives, which is essential for the support of local governance, is to create "*communities that could work on the principle of sociocracy - it means the communities that can build their housing and then manage it by agreement (sociologist)*". In the frame of balanced and compromise solutions, everybody should have the opportunity to change some attributes in their building/environment, for example, through shared space or a community greenhouse/garden on the roof of a house.

The need of experiences

During the interviews, we have also paid attention to the lack of experience with the implementation of the Smart City concept in the cities and towns on the territory of the Czech Republic. Czech central government tries to help the transfer of concept to the condition of Czech urban areas, and that is why "*the Ministry for Regional Development commissioned the methodology of the Smart Cities concept for the money of the Technology Agency of the Czech Republic. It is a kind of cookbook or a brochure on how these cities could deal with this concept so that they can further develop it strategically (geographer)"*. Dissemination of knowledge is

very important for know-how transfer, because "*people need to be motivated and educated in order to get rid of adherence to the current situation. To show them that something works differently and better, for example. That change is possible. Taking them to internships abroad, relevant to their agendas, where they could gain experience and try to transfer good practices to us (evaluation specialist)".*

Concerning its population size, Brno belongs to the secondary cities in the post-socialist space (Bierzynski et al., 2011), and the interviews showed that for successful implementation of smart City concept Brno is very important the transfer of foreign experiences. The communication partners from the public sector usually emphasize their experiences especially from other European countries and the reasons for their selection are usually related to personal experiences This can be illustrated for example by the statements "*I had personal experiences with Freiburg, where there is actually a smart neighborhood, with over 70,000 inhabitants. What impressed me there was that they already had an energy-efficient, economical, a lot of passive home. ...it was really well planned (geographer),* or *we have been on internships in Graz, Aspern in Vienna, and Leipzig, Germany. All of these cities have interesting approaches in implementing their Smart City concept, building their smart neighborhoods (evaluation specialist)".* It is important to support a path of public sector actors from passivity toward entrepreneurship during the regeneration process (Alexandrescu et al., 2014). It could be supported besides by the way that "*all those politicians and competent officials should go on excursions to western cities to see the smart cities and smart neighbourhoods. They should start in Vienna and they should continue… For me, the city of Vienna, near here… is really a showcase for me…(sociologist)".* Private sector actors working for multinational companies collect frequent inspiration in the countries, where these companies operate and where they have major control centers, which can be documented by the statement that "*owner of our company is from Holland, so we travel a lot to Holland for business trips. In addition to Holland, we are also inspired by Germany, England (London) or even Copenhagen is quite interesting. It's essential to think about the application. Whether the news can even be applied in our environment or not. We are very limited by the economy, because we do not have so amounts of money for investment as in Germany (construction engineer)".*

Limits of smart city concept implementation

Implementation of Smart City ideas and technologies in conditions of Brno has to face various types of problems. The actors from the private sector criticized some serious obstacles related

to public administrations. Strict regulation of urban development was criticized, because "*the administrative process is terribly complicated, and that is the cornerstone of all problems.… They limit you to how many square meters of floor space you can build on your property. I think that people, officials from Brno, they block the development of the economy and the growth of Brno. We have a 40-meter-high house…. and it is a terrible problem. Yeah, 40m is nothing for me, but they look at it as a skyscraper…and Brno can't expand as it would like (construction engineer)".* Private sector actors also consider the time frame of decision-making is one of the most serious problems, because *"there are some authorities that have a very long waiting time… We are able to design a house much faster than get the official permissions. This is because there is an urban spatial planning department that issues a binding opinion on almost everything that is currently under construction. Put simply, this means that each project waits 7 months for someone to take it because they do not manage it in terms of the staffing capacity of this office (architect)".*

The reserved approach of Brno public authorities to some smart projects is explained by the fact that "*bureaucracy, by its very nature, is resistant to change, because it carries the risk that the individual with decision-making powers takes on. Basically, in my opinion, it is a contradiction for public administration to be innovative because the risk of failure is too great there, and you are managing public funds. You cannot be a pioneer of dead ends …(sociologist)".* Actors related to public administration could be afraid by the dominance of private sector actors in Smart cities projects, which can be illustrated by the statement that "*in the Smart City concept there is a very strong role for the private, business sector. And here is the danger of why some are afraid to implement Smart City projects (geographer)".* Some actors see the problem in the fact "*that it is very difficult for public administrations to organize public competition focused on new innovative smart projects when technological development is fast forward, and there are many different solutions on the market. .....And if we are not able to innovatively award public contracts, we will not even be able to compete for innovative projects (evaluation specialist)".*

In the Czech Republic, system support for the smart cities concept has been lacking in the past, but the government's approach is gradually changing. As an evaluation specialist stated "*unfortunately, this is still missing, and assistance is also missing from the state, which should be more active in it. At the same time, any subsidiar national tools for developing Smart City technologies are missing. It has been a common practice in Austria for several years".*

RE:ŠPITÁLKA AND SPILLOVER EFFECTS

The respondents also emphasize the importance of the pilot innovative projects, because "*new concepts and ideas can push through an innovative project that can copy, replicate further into the city. An innovative pilot project will cause some break in the barrier where everyone still says we don't know… (sociologist)"*. Local government officials in Brno are aware of the significant importance of positive examples of successful recycling of urban space, and therefore selected examples of successful urban regeneration have been published (Brno Brownfields, 2013 and Brno brownfields, 2015). The neglected and abandoned urban areas in Brno suffer from many economic, environmental, and social problems. Therefore, the different innovative approaches are used to support an effective process of urban recycling. From a social perspective, Brno tested new approaches as re-integration of homeless people (Housing First, 2017) and the creation of shared flats for seniors following experiences from Vienna. Concerning the implementation of Smart City concept in the condition of the Czech Republic and Brno, there was emphasized that "*it would help some pilot project to show how to do what that smart quarter should have. This would say what it is important to watch out for, what the financing options are and the cities then decide whether or not to go for it…(Geographer)"* and "*if the Špitálka pilot project is successful, we will be able to look forward to have more smart neighbourhoods both in Brno and in the whole Czech Republic in the future (sociologist)"*. The communication partners commented the role of the pilot project Špitálka in the positive way as *"a very good step forward because we are actually trying to inspire the foreign projects and learn also from their mistakes. I think that Brno is trying to create a smart neighborhood, the Špitálka project, is a great success. Finally, we have an engine that works and is trying to support the change. In this case it is a plus that the location is owned by the city …(architect)"*. From a local perspective, the success of the Špitálka model project will undoubtedly depend on whether the surrounding urban areas can be successfully solved and transferred to modern urban areas. Above all, there is an important project of the main street, which is to enable the reconstruction of the old abandoned areas not only in Špitálka, but also neglected sites and brownfields in the vicinity (Prokopová, 2020).

CONCLUSION

The research identified that there are different factors which determine the successful implementation of smart city concept during the process of brownfields regeneration in the conditions of the post-socialistic urban environment. The concept of smart cities is strongly tied

to technologies, and the project creating smart neighbourhoods requires substantial financial investments. During the socialist period, many properties fell into disrepair state because there was a permanent lack of investment. In the period after 1989, there was a huge increase in the occurrence of brownfields and especially in declining urban municipalities (Martinát et al., 2016) or in small municipalities (Navrátil et al., 2019) each type of brownfields redevelopment is perceived as a great success. Brno is the second largest city of the Czech Republic designed the ambitious vision in long term period anchored in strategy Brno 2050 and therefore is testing, how to regenerate urban brownfields in the different innovative ways. However, even in Brno, there could be among some stakeholders distrust to implementation of the Western concept as creative industries (Rumpel, Slach, & Koutský, 2010; Alexandrescu et al., 2020) or smart cities in case of Špitálka site. Applying the marketing practices (especially communication mix) to involve residents and secure broad public participation has the potential to overcome this distrust. From the perspective of Brno stakeholders, who live in conditions of post-socialistic urban space, the successful transfer of foreign experiences is very important, especially from other European countries. Among the most effective ways of the transferring of smart knowledge belong abroad internships for Czech officials and self - government representatives and visits of foreign experts from cities, which have more experiences than Brno in the implementation of Smart City concept. Brno participation at EU project RUGGEDISED brought new and important development impulses including the creation of pilot project Špitálka. If this model project is successful, it can contribute not only to the further successful urban development in Brno but also to the sites in other Czech cities and towns.

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