

Article

Application of the Global Concept of “Smart City” at the Local Level of the Karviná District

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Abstract: The article deals with the implementation of the global concept of Smart City or Smart Municipality at the local level, specifically in selected municipalities and towns of the Karviná District located in the Czech Republic. Specifically, these municipalities form a union of municipalities under the name Union of Towns and Municipalities of the Karviná District (SMOOK). The paper summarizes the results of research aimed at finding out how the representatives (mayors and city mayors) of a selected sample of municipalities and towns of various sizes approach the implementation of the global concept of Smart City at the local level, i.e., within the municipalities they manage. Within the questionnaire, representatives (mayors and city mayors) of towns and municipalities were offered several typified projects in several areas of activities that the municipality or town performs. Respondents could also mention other projects that they were implementing in the given area. The areas where the surveyed towns and municipalities use the most widespread range of smart solutions are city administration and the related use of information and communication technologies. Municipalities pay attention to these areas and plan to introduce other innovative solutions. Due to environmental problems and air pollution in the Karviná Region, they do not neglect the areas of environment, transport and power engineering. On the contrary, marginal areas in the implementation of smart projects for them are business support and social services. A significant motivation in the implementation of smart projects is the possibility of obtaining grant funds.

Keywords: smart city; mayor; city mayor; project; self-government; digital agenda; municipality; town

1. Introduction

The Karviná District is a region in the Czech Republic whose economy has long been based on heavy industry and, above all, hard coal mining. For several years now, it has been undergoing a major restructuring associated with all the negative social consequences for the local population. The high unemployment rate that has affected this region for a long time causes, among other things, a momentous outflow of population. The management of municipalities thus faces the challenge of making the living conditions in local municipalities and towns more attractive so that they become more appealing for people’s permanent lives.

One of the ways is the implementation of projects that fit into the currently popular concept of Smart City. This is a concept by which municipalities will use state-of-the-art technologies to streamline their administration and simplify their operations, as well as to create conditions for easier communication with their inhabitants. Smart City projects should also expand the range of services they offer to their residents.

However, the term Smart Cities does not yet have a well-established definition. In general, it can be said that it is a concept that applies the principles of sustainable urban development using modern technologies to improve the quality of life and streamline public administration. Opinions on this

concept also vary significantly not only among experts who have been dealing with this issue for a long time but also between representatives of cities, towns and municipalities. The willingness to implement projects, which are generally referred to as smart solutions, then stems from this. It is the attitude of city mayors, mayors and management of cities, towns and municipalities that is crucial in this regard.

The paper summarizes the results of research aimed at finding out how the representatives (mayors and city mayors) of a selected sample of municipalities and towns of various sizes approach the implementation of the global concept of Smart City at the local level, i.e., within the municipalities they manage. The survey took place in May–October 2019, through a questionnaire, which was sent to representatives of municipalities and towns in the Karviná District.

2. The Theoretical Background of the Concept of the “Smart City”

The concept of the smart city can be described as a current phenomenon in the area of computerization of society as evidenced by emerging projects and a growing number of publications on this topic. However, we do not find a clear definition in the literature that all authors follow. Individual creators of definitions adapt the term Smart City to their point of view on this issue, so it is possible to find both technologically and urban-oriented definitions. However, the volatility of the concept is also affected by different approaches across countries.

These days, there are many ways to use smart technology to make the city run better. Specific examples include smart parking using a mobile application, which allows the driver to get to the nearest available spot more quickly; smarter waste management; energy-efficient public lighting; or even intelligent travel in public transport. Each city has its own intelligent elements, which it individually implements according to the needs of the city. However, no one element makes the city a Smart City [1].

According to Ander [2], however, this concept does not only apply to the technologies used but has a more profound meaning in the overall economic growth of the city and in improving the quality of the environment. These aspects can then influence the subjective perception of life in these cities by citizens who will not need to leave these cities and look for a more favorable environment for their lives. According to Deakin [3], it is the human element that is a vital chapter for smart cities, as information and communication technologies alone cannot automatically improve and transform cities.

In Europe, the term Smart Cities was first used in 2007 in the framework of the Strategic European Technology Plan (the so-called SET Plan), the subject of which, in addition to Smart Cities, was mainly issues related to the future of energy [4]. The European Commission’s Digital Agenda then defines a smart city as follows: “A smart city is a place where traditional networks and services gain more efficiency through the use of digital and telecommunications technologies for the benefit of its citizens and businesses” [5].

The concept of Smart City seeks to make maximum use of modern technologies, mainly information technologies, to influence the quality of life in a given city in such a way that there are synergies between different sectors (transport, logistics, security, power engineering, building management, etc.) concerning energy intensity and quality of life of citizens in a given city. Emphasis is placed on “hard” and “soft” aspects of city life management.

Ahvenniemi et al. [6] in their work deal with the differences between smart and sustainable cities. They refer to the growing interest in the concept of Smart Cities, as the increasing rate of urbanization leads to an ever-increasing burden not only for the environment but also for cities comprehensively. Pavlík states that “sustainable development is a concept of human society, which is based on three basic pillars, namely economic, environmental and social.”

In their work, the authors Berardi and Monfaredzadeh [7] point out the conditions under which Smart Cities can be sustainable, competitive, or simply smart. Based on selected indicators, it is evident that each concept is focused on a different area. The environment is the most important issue for sustainable cities; smart cities focus on their citizens, and the most important areas for competitive

cities are the economy and business. Finally, they highlight that these concepts need to be pursued and explored together, as trying to pursue one of these goals means suppressing another.

The literature does not pay much attention to the organizational aspect during the transition from a classic city to a Smart City. Without the mayor and the rest of the management, however, change is hard to imagine. The system cannot work without the main character actively supporting the transition. "Governance in smart cities must support policies to strengthen innovative systems, specifically focused on knowledge and cultural development, which need to be carefully designed by the governing body" [8]. For residents, the mayor can also face the entire planned vision.

Some authors even refer to it as a "winning trigger" to manage the optimal implementation of the project [9]. The position of mayor can thus be understood as a leader who is not only able to pass on the idea of a Smart City to the inhabitants but also skilled in maintaining relationships with stakeholders. Particularly, in the beginning, cooperation with private companies and local universities can facilitate all social change [10].

However, city governance must pay attention to other aspects besides support. Cities are separate settlements, but as such, they are also part of a larger system. Depending on the specific country, they fall under different superior units, which may be, for example, regions, districts, or provinces. From this point of view, therefore, they are subject to certain entities above them.

The highest state authorities are behind the legislation and regulations that can significantly influence cities and their behavior. If the state leadership openly supports the development of the computerization of cities and similar changes, then the positive impact can be passed on to the inhabitants themselves.

Some authors also attach more importance to policy-making areas around Smart Cities than to technology itself [11]. The city's communication with the authorities must be done as smoothly and efficiently as possible. However, knowledge of laws, directives, or restrictions is also required. Technologies and new services interfere in public affairs, and this area also needs to be addressed by legislation so that no problems arise in the future or so that it is possible to appeal to a certain body.

The level of attention paid by the government to the electronic public administration is reflected in other similar directions, so subsidy projects may also arise to support cities in the electronic service. e-Government allows citizens to communicate with public administration using information technology. Some services may be connected to cities in the future, or residents may gain first-hand experience of how they can contact public authorities and use their services remotely.

e-Government aims to improve the efficiency of public services through online accessibility. At the city level, however, we can deal much more with e-governance or smart governance. "Smart governance is an activity of coordinated communication to achieve collective goals through collaboration" [12]. City management can use this way to connect with its inhabitants and thus at the same time establish a form of participation that finds benefit, for instance, in decision-making in specific cases. The involvement of residents through information technology also eliminates the need to go to the office in person and allows monitoring of current events in the municipality.

The designation of a city as Smart can be taken as one of the other evolutionary elements that selected towns are currently going through. With this approach, the mayor, along with the rest of the management, can renovate the necessary areas, as needed, and view the entire city as an ever-evolving system [13].

While the introduction of various elements of the concept of a Smart City or Municipality is relatively common in many countries around the world, including European ones, it can be said that it is in its infancy in the Czech Republic. This concept has been intensively discussed for the last 10 years or so, and the management of municipalities and especially cities has only been approaching their implementation on a larger scale in recent years. That is why this issue has become interesting in the Czech Republic for research only in the past three years. Thus, several studies were carried out, the aim of which was to evaluate how municipalities and cities in the Czech Republic or certain regions

apply the concept of a Smart City or Smart Municipality or how they approach it. Several of them are worth mentioning.

The Czech-German Chamber of Commerce and Industry carried out the first study in cooperation with the Ministry of Regional Development of the Czech Republic and the Union of Towns and Municipalities of the Czech Republic in 2017 [14]. One hundred twenty municipalities and towns of various sizes from all over the Czech Republic took part in the survey, the aim of which was to discover what towns and municipalities needed to become Smart. As the survey showed, only two out of ten small municipalities in an area had already implemented a Smart solution, compared to three-quarters for cities. For two-thirds of small municipalities, the topic of Smart City was new, and they had dealt with it for less than a year. Besides, only five percent of them had a responsible person or coordinator who further developed this topic. In contrast, in cities, it was almost 60%. Implemented or planned smart projects focus primarily on information systems for citizens, security in public space, smart lighting and energy, transport systems, or open government. For up to 70% of the surveyed municipalities and cities, the biggest obstacle to the implementation of smart solutions was the lack of funding. For two-fifths of cities and municipalities, the lack of know-how or staff capacity or the lack of an overall concept and a high degree of bureaucracy was a major problem.

Another of the similarly focused types of research was carried out by the Central Bohemian Innovation Center, which in 2018 surveyed 290 municipalities and cities of the largest region in the Czech Republic, the Central Bohemian Region [15]. Even in this case, it was confirmed that the conditions for the implementation of smart solutions were far better in larger cities than smaller municipalities. In the year when the survey took place, 40% of municipalities and cities did not have a concept of a Smart City elaborated in any strategic document. In the field of smart urban management, cities and municipalities, regardless of size, had the greatest experience with electronic filing projects. Municipalities and cities have declared little experience in the field of transport and mobility. Even in the field of projects in the area of environment and power industry, they did not show any significant experience, whereas municipalities and cities had the greatest experience with projects for optimizing waste management. On the contrary, municipalities had the greatest experience with the implementation of smart solutions in the field of communication technologies, specifically projects of public Wi-Fi connection, open data and camera systems. This research also confirmed as the most fundamental problem the lack of funds for the implementation of the concepts of a Smart Municipality or city.

The conclusions of both above-mentioned surveys are confirmed by much the broader research of Mendel University in Brno, which was carried out in 2018 [16]. It aimed to map the current state and degree of involvement of individual regions, regional cities and former district cities in the Smart City/Smart Region concept, along with the process of implementation of this concept and opinions on the need for its support. The surveyed cities saw the motivation for the implementation of the Smart City concept mainly in increasing the efficiency of public administration, especially thanks to the possibility of database management. Other motives involve cost reduction, savings, increasing the quality of services provided to residents and visitors to cities, improving the quality of environment and life in the region, striving to keep up with time, financial and time savings, data value, city development, new city services, a vision of a city with progress in new technologies, complex effective solutions, traffic calming, stopping the outflow of people, services for tourists, PR (Public Relations) for the city, energy savings, saving labor, simplifying the agenda and intensifying the involvement of citizens in the city administration. Lack of financial resources, legislative obstacles, insufficient political will and administrative complexity were identified as the biggest obstacles to the implementation and development of the Smart City concept. The vast majority of cities use and still assume the use of their own resources and grant headings from both national and European sources to finance smart solutions [17].

3. Aim and Starting Points of the Research

The aim was to find out how the representatives (mayors and city mayors) of a selected sample of municipalities and towns of various sizes approach the implementation of the global concept of Smart City at the local level, i.e., within the municipalities they manage.

The addressed municipalities and towns comprise members of the Union of Towns and Municipalities of the Karviná District (SMOOK), while their representatives (mayors and city mayors) of cities, towns and municipalities were offered several typified projects in several areas of activities performed by the municipality or city/town within the survey. Respondents could also mention other projects that they were implemented in the given area.

Specifically, we are dealing here with 16 of the 17 towns and municipalities that make up the Karviná District. The list does not include the town of Český Těšín, which is not a member of SMOOK. These municipalities cover an area of 322.36 km² and have almost 225,000 inhabitants (Table 1). Municipalities, although differing in size and structure of population and their economies, work closely together in many areas within SMOOK and seek joint solutions to fundamental problems of governance and the functioning of self-government. One of the areas in the center of their attention is the introduction of new modern elements into their management and the provision of public goods and services, which can be described by the frequent term SMART.

Table 1. Basic characteristics of member towns and municipalities of SMOOK (Union of Towns and Municipalities of the Karviná District).

Municipalities	Population (end of 2019)	Area (km ²)
Albrechtice	3873	12.68
Bohumín	20,761	31.02
Dětmárovice	4227	13.76
Dolní Lutyně	5216	24.87
Doubrava	1201	7.77
Havířov	72,386	32.07
Horní Bludovice	2385	8.99
Horní Suchá	4464	9.79
Chotěbuz	1340	10.61
Karviná	53,522	57.49
Orlová	29,108	24.76
Petrovice u Karviné	5410	20.46
Petřvald	7189	12.63
Rychvald	7377	17.02
Stonava	1851	13.86
Těrlicko	4472	24.65
Total	224,778	322.36

Of the above towns and municipalities, 11 actively participated in the survey. The survey was rejected by the town of Bohumín, the Statutory City of Karviná, the Statutory City of Havířov, the town of Petřvald and the municipality of Horní Bludovice. Except for the town of Orlová, which exceeds 29,000 inhabitants, these are municipalities with a population not exceeding 7500, three of which (Stonava, Doubrava and Chotěbuz) have less than 2000 inhabitants.

The survey took place in May–October 2019, through a questionnaire, which was sent to representatives of municipalities and towns in the Karviná District. Specifically, the Central Bohemian Innovation Centre created the questionnaire used in the pilot survey based on similarly designed questionnaire surveys in other regions. In 2018, the mentioned center conducted a survey within the Central Bohemian Region [13]. Within the questionnaire survey, five main areas were primarily examined, on which the so-called “Smart Cities” and “Smart Municipalities” are primarily concentrated: Smart City governance, Transport and mobility, Environment and power engineering, Business support and social services, and Information and communication technologies. In these areas, typical projects

were listed, to which the representatives of the cities were supposed to express whether they had experience with the implementation of such a project or a similar one, or whether they planned to implement it.

These five areas certainly do not represent a complete and final list of areas in which the concept of “Smart City” or “Smart Municipality” can be implemented, and a list of typified projects offered to municipalities and towns cannot be considered complete. Therefore, the respondents could also list another project in the given area with which they have experience or would like to implement in the future. However, no one from the respondents used this chance. Town officials were also asked to comment on how they perceived the “Smart City” or “Smart Municipality” concept.

4. The Results of the Conducted Research

4.1. Opinions of Municipal Representatives on the Essence of “SMART CITY”

The initial question of the questionnaire (What do you imagine under the term “Smart City” (SMART CITY) or “Smart Municipality”?) aimed to monitor how mayors and city mayors perceive the term SMART CITY. Their answers are given below for interest:

- “Reasonable use of modern technologies in transport, services, and citizen information” (Albrechtice).
- “A municipality that has no problem with an ugly station, has no damaged roads, there is a place to live for the poorer population, both medical care and a dentist are available and there is a pharmacy available for the elderly. Furthermore, there is no problem with the quality of roads of all kinds and people live here happily. There are sports options for all groups of the population, there is comprehensive support, especially for children of school and preschool age and seniors. Associations work well and cross-border cooperation works. There is a modern sewage system and rainwater can be collected in a controlled manner. The population is growing and it is optimally involved in the events of the municipality. Tourism works well here, people find their bearings well and there is an information system based on the latest technologies using “smartphones” as well as regional television and hardware owned by the municipality for communicating information, such as arranging bicycle and car-sharing, self-driving cars, fast internet, etc. This will come next—It will be more important for electronic communication boards to be used, for pupils to study new technological possibilities with interest at school, to learn what the environment is and what to do with it. There are many things and I will not list them all” (Dětmárovice).
- “Economically advantageous and efficient administration of the municipality” (Dolní Lutyně).
- “A municipality with modern technologies that will make life easier for citizens in the municipality” (Dobruška).
- “Usually not what traders with different SW are trying to sell us. The computerization of public administration must be a process, not a goal” (Horní Suchá).
- “Everything should work, have logical connections, and be accessible to citizens.” (Chotěbuz).
- “A municipality that provides its inhabitants with quality services and conditions for their happy daily life, even with the use of modern technologies. In doing so, the municipality had to monitor the sustainability of the services offered and thus at least their basic economic meaningfulness” (Petrovice u Karviné).
- “Using new technologies and comforts of today’s means of communication for contact with citizens and community management” (Rychvald).
- “Creating combinations of the introduction of technical innovations and innovative approaches to the management, organization, and administration of the municipality and life in it” (Stonava).
- “SCI-FI.” (Těrlicko)

The mayor of Orlová did not answer this question at all. This reaction thus fits into the context of the reactions of the representatives of the above-mentioned larger towns within the district, who orally informed the processor that they did not deal with the definition and designation of “SMART CITY”, which they consider a purely marketing term to impose certain products on them. They need to create quality conditions for the life of their inhabitants in a given town and municipality, and, logically, this goes hand in hand with the use of modern technology. Moreover, for this reason, they did not participate in the questionnaire survey.

The answers of the mayors, mostly of medium-sized or smaller towns and municipalities, who participated in this questionnaire survey, also largely correspond to this. Based on the above, it is impossible not to ask the fundamental question, namely whether it makes any sense to deal with the definition of the term SMART CITY. Obviously, there is no need for this on the part of the representatives of towns and municipalities. If we proceed to the need to define the term, who should create this definition and based on what criteria to divide municipalities and towns into the so-called SMART and those that are not so-called SMART?

In this context, another group directly involved in the functioning of municipalities is offered, namely their inhabitants. The inhabitants themselves are the end-users of the services provided by the municipality or town. In this respect, it seems appropriate to conduct further research among the inhabitants of a selected group of municipalities and towns.

Despite the above, most municipal representatives stated that although they did not have exactly the concept of “smart solutions” incorporated into their strategic documents; they assumed that this would be the case in the future. A smaller part of municipalities and towns then have the measures already mentioned in the strategic documents, even though they definitely do not use the SMART label for them. Here, too, a relatively reserved attitude towards terminology using the term SMART can be seen. The statement of the mayor of Těrlicko speaks for itself in this direction: “We have been planning smartly for a long time, but we use Czech words”.

4.2. Smart City Administration

The first area examined was Smart City administration, which includes projects whose primary goal is to improve the municipality’s management process, bring the office closer to the citizens and streamline communication between the citizen and the office through innovative tools.

The results of the survey are shown in Table 2. This table shows that the municipalities, for the most part, operate an electronic filing office and ensure the availability of electronic forms for most of the official agendas they carry out. The vast majority of respondents also offer contactless payments to citizens at the office via mobile phones and payment cards, but almost a third are not planning to introduce this service. Similar results are in the case of publishing contracts beyond legal obligations and electronic tendering. The interviewed municipalities consider the establishment of information applications, a call center or an electronic ordering system to be completely redundant. This fact can be explained by the fact that larger towns, except for Orlová, where the ordering system exists, did not participate in the survey.

The answers provided support the fact that the municipalities assume generally a positive attitude to the so-called smart solutions in the given area and are already implementing several projects. However, the introduction of new additional projects is carefully considered due to their potential practical applicability in the activities of that particular municipality.

Table 2. Summary of respondents' answers to typical projects in the area of "Smart City administration".

Project	Experience of the Town (Municipality) with the Implementation of Projects		The Town (Municipality) Plans the Implementation of Projects	
	YES	NO	YES	NO
Electronic filing office	8	3	1	2
Detailed electronic budget on the town portal	4	7	2	5
Participatory systems (collection of ideas and comments from citizens)	5	6	3	3
Access to electronic forms for individual agendas	8	3	2	1
Register of contracts accessible to the public	6	5	2	3
Mobile communication with clients of municipal authorities	4	7	1	6
Electronic questionnaire of citizen satisfaction	5	6	2	4
Electronic registration of candidates for public contracts	6	5	0	5
Payment gateway for payment of fees at the office	5	6	2	4
Contactless payments via mobile phones and cards	6	5	2	3
Information system on the status of issued documents	2	9	1	8
Electronic ordering system	2	9	0	9
Information applications (e.g., IN CITY, etc.)	0	11	2	9
Establishment of a call center	1	10	1	9
Mobile radio	5	6	2	4

4.3. Transport and Mobility

Another area that is in the spotlight of the survey is transport. Obviously, every municipality attaches great importance to the transport system and its functioning. Its quality significantly affects not only the daily routine of the city or municipality but also above all the standard of living of its inhabitants. In addition, transport and mobility are areas where several new and innovative solutions can be introduced, which contribute not only to increasing its efficiency, comfort or safety but also to improving the quality of the environment.

Even in this case, typified projects were offered to town representatives, while they had the opportunity to supplement their own. As in the previous research area, this did not happen. The results of the survey are summarized in Table 3.

In this area, towns and municipalities do not have much experience with the implementation of typified projects. As many as five surveyed municipalities stated that they had no experience with any of the above projects. The greatest (albeit still small) interest in municipalities is the sectional measurement of the speed of vehicles and smart pedestrian crossings. For other projects, the experience is either zero or very small.

A significant improvement in this area cannot be expected in the future either when the survey shows that most municipalities and cities are not going to prepare for the implementation of any of the projects, let alone implement them. An explanation can be found in the size of the surveyed municipalities, which is closely related to the meaningfulness of the implementation of most of the listed typified projects, which are more useful for larger cities with complex transport systems. This is confirmed by the town of Orlová, which is currently implementing only a small part of the project; however, it is preparing to implement some others in the future.

Table 3. Summary of respondents' answers to typical projects in the area of "Transport and mobility".

Project	Experience of the Town (Municipality) with the Implementation of Projects		The Town (Municipality) Plans the Implementation of Projects	
	YES	NO	YES	NO
Sectional vehicle speed measurement (incl. police connection)	4	7	2	5
Intelligent public transport stops	2	9	1	8
Smart pedestrian crossing	4	7	3	4
Light-controlled intersection with detection of public transport vehicles	1	10	1	9
Smart parking systems	0	11	1	10
Use of e-bikes for the public (employees), incl. setting up charging stations	0	11	3	8
Use of electric cars	1	10	3	7
Smart benches	1	10	2	8
Information system of the integrated transport terminal	2	9	2	7
Occupancy control and guidance to free car parks	0	11	0	11
Integrated traffic management using Geographic information systems	0	11	1	10

4.4. Environment and Power Engineering

The quality of the environment in municipalities and towns is not only affected by transport and its intensity. Many other factors affect the environment, whether in a good or bad sense. At present, more and more attention is being paid to climate change, which is leading to the warming of the country, which has been reflected in the decline of water in nature in recent years. Moreover, municipalities are dealing with ever-increasing costs for the management of municipal waste, wastewater and air pollution. There are also several examples of so-called smart solutions in these areas, which could help to improve the situation in this area.

Representatives of the municipalities and towns of the Karviná District, i.e., the district that has long been ranked among the regions with the worst environment in the Czech Republic, also had the opportunity to comment on the most frequently used smart solutions in practice. The frequency of answers to this issue is summarized in Table 4.

As one would expect, municipalities most often implement projects that solve its current acute problems, which are closely related to considerable immediate operational financial savings. These are often also projects whose implementation is financially supported by national and EU subsidy titles. Specifically, these are projects involving the optimization of waste management, reducing the energy intensity of buildings, which goes hand in hand with energy audits and projects related to public lighting, whether in the form of introducing energy-saving Light-Emitting Diode lighting or smart lamps that regulate lighting according to intensity daylight. Almost half of municipalities and towns also pay attention to air measurement and the system of measuring water levels. Other projects are on the verge of interest of the surveyed municipalities and towns, and it is apparent that municipalities currently do not even expect to make any efforts to prepare them.

Table 4. Summary of respondents' answers to typical projects in the area of "Environment and power engineering".

Project	Experience of the Town (Municipality) with the Implementation of projects		The Town (Municipality) Plans the Implementation of Projects	
	YES	NO	YES	NO
Optimization of waste management (bio, sorted, municipal)	10	1	0	1
Energy audit of public buildings	10	1	0	1
Reduction of energy-intensive buildings and energy optimization	11	0	0	0
Installation of saving Light-Emitting Diode lighting	9	2	1	1
Creation of capital project and green passport	4	7	4	3
Water flow level measurement system associated with crisis management	5	6	1	5
Smart lamps regulating lighting according to the intensity of daylight and the presence of pedestrians	3	8	5	3
Construction of underground containers for waste sorting	0	11	3	8
Reuse of wastewater	1	10	1	10
Renewable sources (hydroelectric power plants, photovoltaics, biomass)	1	10	2	9
Smart bins (with press, Wi-Fi, solar panel, collection optimization)	1	10	0	10
Air quality measurement	5	6	3	3
Smart grids (electric, water management, etc.)	0	11	1	10
Smart grids (electric networks enabling the regulation and production of energy in real-time)	0	11	0	11

4.5. Business Support and Social Services

Very important services that municipalities provide to their inhabitants are also those in the social area. They can often work on them in various projects and with the business community. Entrepreneurship and its support are also often the focus of municipalities. Even in these areas, we can encounter many projects, which we can include among the so-called "smart solutions", which can expand cities and municipalities and improve the services provided to their citizens.

For the survey, nine typified projects were selected, through which the approach of municipalities to smart access in these areas was ascertained. As in previous cases, it was also possible to expand the range of projects offered by projects that municipalities implement and consider them smart, yet they were not included in the list submitted to them. Even in this case, none of the municipalities mentioned any project. The results of the survey are shown in Table 5.

It is evident from the above table that this area is the one within which municipalities do not prefer the implementation of smart projects. An exception is the social taxi project, which is operated by seven municipalities. Almost half of them also try to activate pupils and students in search of new interesting projects that could be used in the governance of the municipality. Municipalities also do not pay attention to enlightening the concept of the Smart City (or Municipality) to their citizens, and the vast majority of them do not even consider it important in the future. Cooperation with business entities on solving projects of common interest is also marginal. The area of "business support and social services" is thus the area where the fundamental promotion of smart solutions cannot be expected in the surveyed municipalities in the future either.

Table 5. Summary of respondents' answers to typical projects in the area of "Business support and social services".

Project	Experience of the Town (Municipality) with the Implementation of Projects		The Town (Municipality) Plans the Implementation of Projects	
	YES	NO	YES	NO
Participation of pupils and students—collecting ideas, education	5	6	3	3
Cooperation with local entrepreneurs (in building e.g., optical networks, sensor systems, in power engineering, etc.)	2	9	1	8
Social taxi/CareDriver (collection of traffic-excluded citizens)	7	4	1	3
Public enlightenment and educational events on the issue of the Smart City or municipality	0	11	4	7
Cooperation with suppliers for technology testing (pilot projects)	0	11	1	10
Land preparation to build a science and technology zone	1	10	0	10
Shared babysitting	0	11	1	10
Participatory business models and services for citizens	1	10	1	9
Rideshare (vehicle sharing)	0	11	0	11

4.6. Information and Communication Technologies

If municipalities, as the survey shows, consider the support of entrepreneurship and social services in terms of the introduction of new innovative approaches to be a relatively marginal issue, then in the case of information and communication technologies it is completely different. From the results of the survey, which are summarized in Table 6, it is clear that municipalities attach relative importance to this area not only now but especially in the future when they plan to implement several projects.

At present, the use of open data such as map portals, zoning plans and data about networks is the most widespread among municipalities and cities, etc. Of immense interest is the introduction of camera systems or applications that allow online reporting of faults in the field. Although only four municipalities in their public spaces currently operate public Wi-Fi, it can be assumed that in the near future, their number will increase significantly and this service will thus become a common standard in the surveyed municipalities. The least interest among municipalities is in the implementation of integrated alarm systems.

Table 6. Summary of respondents' answers to typical projects in the area of "Information and communication technologies".

Project	Experience of the Town (Municipality) with the Implementation of Projects		The Town (Municipality) Plans the Implementation of Projects	
	YES	NO	YES	NO
Open data (data acquisition and sharing, map portals, zoning plans, data on power engineering, transport, etc.)	6	5	3	2
Camera systems	6	5	4	1
Implementation of public Wi-Fi connection	4	7	5	2
Integrated alarm systems (floods, smog, safety)	2	9	4	5
Online reporting of faults and errors in the field	5	6	2	4
Interactive information boards	3	8	4	4

5. Discussion and Conclusions

Smart City is a global concept that aims to introduce information and communication technologies and tools for more efficient urban governance and citizens' involvement in its creation [18]. It can be stated that the concept is understood by this definition in principle by most mayors of towns and municipalities that participated in a pilot survey conducted within the members of the Union of Towns and Municipalities of the Karviná District. The Karviná District is one of the industrial regions in the Czech Republic. Surprisingly, the survey met with a very reserved approach of the mayors of larger towns such as Bohumín, Karviná, or Havířov, who did not participate in the survey. Apart from the mayor of the town of Orlová, in most cases, the mayors of smaller municipalities and towns with a population not exceeding 7500 expressed interest. Participating mayors would welcome information on projects implemented by other municipalities and cities, which can be very inspiring for them to make further decisions. Some municipal representatives also expressed interest in workshops and seminars devoted to this issue, as well as expert advice in the area of subsidies, which could support the implementation of smart projects in their municipalities and cities. The existence of a regional platform of municipalities, research organizations and the business sphere, within which they could exchange their experience and knowledge in this area, also seemed interesting to them. Finally, yet importantly, municipalities also showed interest in expert advice on technological solutions for smart projects.

The survey also shows the fact that municipalities do not pay attention to acquainting the public (their inhabitants) with the essence of the concept of "Smart City (municipality)". They are aware of this fact; however, only a small part of them consider it necessary to address this shortcoming.

These findings fully correspond to the conclusions of similar research that has been conducted in recent years in the Czech Republic. Both the research of the Central Bohemian Innovation Center [15] and Mendel University in Brno [16] concluded that representatives of municipalities and cities would like to be more familiar with examples of so-called good practice and inspiring smart projects that already operate in municipalities and cities of similar size.

In the conclusions of its survey "What do cities and municipalities need to become smart?" [14], The Czech–German Chamber of Commerce and Industry states that almost 75% of the surveyed municipalities did not include the concept of a Smart Municipality in their development strategy. The Central Bohemian Innovation Center comes to slightly different conclusions, stating that, so far, 40% of municipalities and cities have not developed the concept of a Smart City in any strategic document. In the case of the municipalities and cities we studied in the Karviná region, the percentage of those that have not yet included smart projects in their strategic documents represents 65%. This is more than that of municipalities and cities in the Central Bohemian Region, but less than that shown by research by the Czech–German Chamber of Commerce and Industry throughout the Czech Republic [16]. The positive fact is that the representatives of municipalities and cities are aware of this fact and intend to correct this shortcoming of their long-term conceptual development documents. In particular, the Central Bohemian Innovation Centre created the questionnaire used in the pilot survey based on similarly designed questionnaire surveys in other regions. In 2018, the mentioned center surveyed within the Central Bohemian Region. The results of both surveys are similar in many ways.

Areas where the surveyed towns and municipalities use the most widespread range of smart solutions are city administration and the related use of information and communication technologies. Municipalities pay attention to these areas and plan to introduce other innovative solutions. The stated finding is again in line with the conclusions of all of the above-mentioned studies [14–16]. Municipalities and towns in the Karviná region do not deviate in any way from general trends in the Czech Republic. Due to environmental problems and air pollution in the Karviná Region, they do not neglect the areas of environment, transport and engineering power.

On the contrary, business support and social services appear to be a marginal area in the implementation of smart projects. This finding may be influenced by the fact that the survey involved mayors of smaller towns in particular, whose opportunities to support business on a larger scale, as may be the case for large towns, are very limited. The limits in this direction are given both by the

finances at their disposal and, for example, by suitable premises or land, which they could use to support business and through smart solutions. In the area of social services, the situation in these municipalities is also different from in large towns. While in the case of larger towns, many typical smart projects in the social field have their economic justification thanks to a larger number of potential users, in the case of smaller towns this is usually not the case.

It is also clear from the above that the extent to which municipalities and towns in the region implement different smart solutions in different areas of their operation depends on their size and largely on the approach of their management, in this case especially mayors. If a mayor has a proper awareness of what a “Smart Municipality” and “Smart City” is and, besides, has a supportive attitude towards smart projects, the municipality or town he/she manages is more actively involved in the implementation or preparation of these projects. Among the most active in the Karviná region are beside the town of Orlová, namely the municipalities Petrovice u Karviné, Albrechtice and Dolní Lutyně. On the contrary, municipalities such as Doubrava or Těrlicko lag behind in the number of implemented or planned smart projects. This confirms the opinions of authors such as Bolívar, M; Meijer, or Dameri, R.P.; Benevolo [8,9] on the importance of mayors’ approach to the implementation of smart solutions.

It can also be stated that each of the municipalities has encountered a smart solution to a specific problem in its territory, although the mayors often do not consider them “Smart” in the true sense of the word. The majority of the inhabitants of Karviná directly encountered the concept of a Smart City or municipality in the form of a specific Smart project. However, the question remains whether they really perceive them in this way or rather take them for granted, as was the case with the mentioned town representatives. Finding out the attitudes of the population should, therefore, be the subject of further research.

When implementing smart solutions, municipalities and towns proceed from their long-term development strategies, which include their specific development priorities. However, these priorities can often be accomplished without so-called smart solutions. Here, too, the mayor, city mayor or municipality management plays an important role, as does their attitude to the concept of a Smart City or municipality, as smart projects tend to be associated with higher financial demands for their implementation and operation. The possibility of obtaining subsidy funds, whether from national or European sources, can thus be considered a very important motivation in the implementation of smart projects for towns, principally in situations where the implementation of smart projects is usually associated with high financial costs for municipalities and cities. At present, they consider it pragmatically far more necessary to invest in underfunded infrastructure than to invest in a “superstructure” in the form of smart projects, which was achieved in their research by both the Central Bohemian Information Center [15] and the Czech–German Chamber of Commerce and Industry [14].

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