IOP Conf. Series: Materials Science and Engineering **775** (2020) 012024 doi:10.1088/1757-899X/775/1/012024

Smart city concept as an element in the formation of the economic policy in the South Ural cities

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Abstract. The article shows the new directions and ideas of the Smart City Concept. As elements of the concept, information and communication technologies have been proposed that contribute to the maintenance of existing elements of the urban infrastructure. The key components of a Smart City include modern technologies that ensure ecology, safety of the urban environment, the management of life support systems for citizens of the city, etc. Smart City Concept is a new way to create an environment of maximum comfort for citizens and improve the image of the city.

1. Introduction

Russian economy stagnation amid the emergence of new competitors in the world energy market of raw materials suggests a rethinking of the attitude to the resources available in the country. Russia needs a new economic concept that is not related to the sale of hydrocarbons.

The main wealth of our country is people living in it. There is no development of the Russian economy without the development of human capital, which is the main resource in the conditions of the post-industrial economy.

Particularly acute is the question of preserving human capital for single-industry towns of the Southern Urals, a region that is a centuries-old center of ferrous and non-ferrous metallurgy, from which almost all settlements from the 17th century were built around factories.

Nowadays there is a paradox in the South Ural cities regarding the population: unemployment rate in the South Ural cities is lower than in the country at a whole. This is explained by the presence of a city-forming enterprise, but the population growth is almost exclusively due to migrants from Central Asia. Moreover, the local population mortality rate exceeds the birth rate [1].

The main problem of the Ural cities is the migration of the population to other regions mostly to the central part of the country. The reasons for migration, common to almost all of the South Ural cities, with the exception of the regional center, are considered in the work “Image of Magnitogorsk in the minds of its inhabitants” [2, 3]. The main reasons are low living conditions associated mostly with the environmental situation (the Urals is an area with a developed metallurgical industry) [4, 16, 17, 18, 19, 20], and secondly – lack of the administrational works (as well as other) settlements in terms of providing the settlement with an infrastructure structure. These problems are especially acute compared to past times, which most residents remember very well: in the Soviet period, the unfavorable environmental situation was offset by the widest development of health institutions network (each company had its own medical and health institutions - dispensaries and sanatoriums, as

well as summer and winter suburban camps); in addition, at the state level, the problems of industrial enterprises in the field of environmental safety were resolved: the requirements for the availability and operation of treatment facilities, the use of environmentally friendly technologies were legislated.

2. Materials and methods

Smart City Concept involves the integration of information and communication technologies and the Internet of Things (IoT) for the management of urban property: life support systems, security, transport communications, healthcare and education, and the goal of creating a Smart City is to improve the living conditions for its residents [5, 6].

Nowadays, any city administration positions itself as a separate authority managing the living and settlement in a city, creating and maintaining infrastructure elements, and this position of administrative bodies is spelled out in the charters and does not depend on the use of Smart City Concept, as well as all other concepts of urban governance. Nevertheless, the use of information and communication technologies in ensuring the living in a city carries many opportunities to ensure maximum comfort for urban residents [7].

There are two factors considering the main character of a Smart City: firstly, the ability to obtain operational information online; secondly, the exclusion of the human factor in reactions to standard stimuli [8]. Smart City Concept [9, 10, 11, 12, 13] elements being introduced into the city infrastructure 10-15 years ago, confirm the undoubted value of the idea and the operability of the concept as a whole. As an example, traffic control automation, despite the difficulties associated with determining algorithms based on knowledge of traffic statistics, firstly, it allowed to optimize this traffic by eliminating traffic jams where possible, and to minimize them in those areas where traffic is difficult for a range of reasons. The next step in the development of this element of the Smart City Concept should be the automation of traffic control in case of emergency: identifying a traffic jam and redirecting traffic flows to other highways plus simultaneously involving the appropriate services to solve the problem, including the problem of the entrance of the corresponding service to the scene of the accident. Currently available ICT tools allow you to perform the entire sequence of actions without involving the controlling human factor in it *(Fig. 1).*

As can be seen from *figure 1*, the human factor is used only at the level of dispatch services of the Ministry of Emergency Situations such as ambulance and police: all these organizations operate at the federal level; moreover, it is incorrect to entrust artificial intelligence to make decisions regarding human lives. The exclusion of the human factor when making decisions about traffic redirection will allow us to do this as quickly as possible and to optimize traffic flows in such a way as to avoid traffic collapse.

Another example of Smart City Concept is the use of the Internet of Things by the city administration. The Internet of Things in its usual form is interaction with each other or with the external environment of physical objects provided with means of communication [14, 15]. Most often, as an example of the Internet of things, they include a watering system for the adjoining area, which is activated by the signal of the smartphone's alarm clock or the products ordered by the refrigerator that are not in it.

The principle of the interaction of physical things based on communication tools should be implemented in many areas of urban life. Street lighting photocells have been used in the cities for so long that it seems to us a wild idea to switch the lighting on manually. However, now the Internet of Things at the city level is limited only to these devices. Nevertheless, even existing devices and resources are sufficient to regulate the heat supply in apartment buildings by this principle, the pressure of water in the water supply intensively, and the use of specially prepared garbage containers that determine the filling speed, which optimize transport routes, taking out solid household waste. The principles of the Internet of Things will help in many other cases.

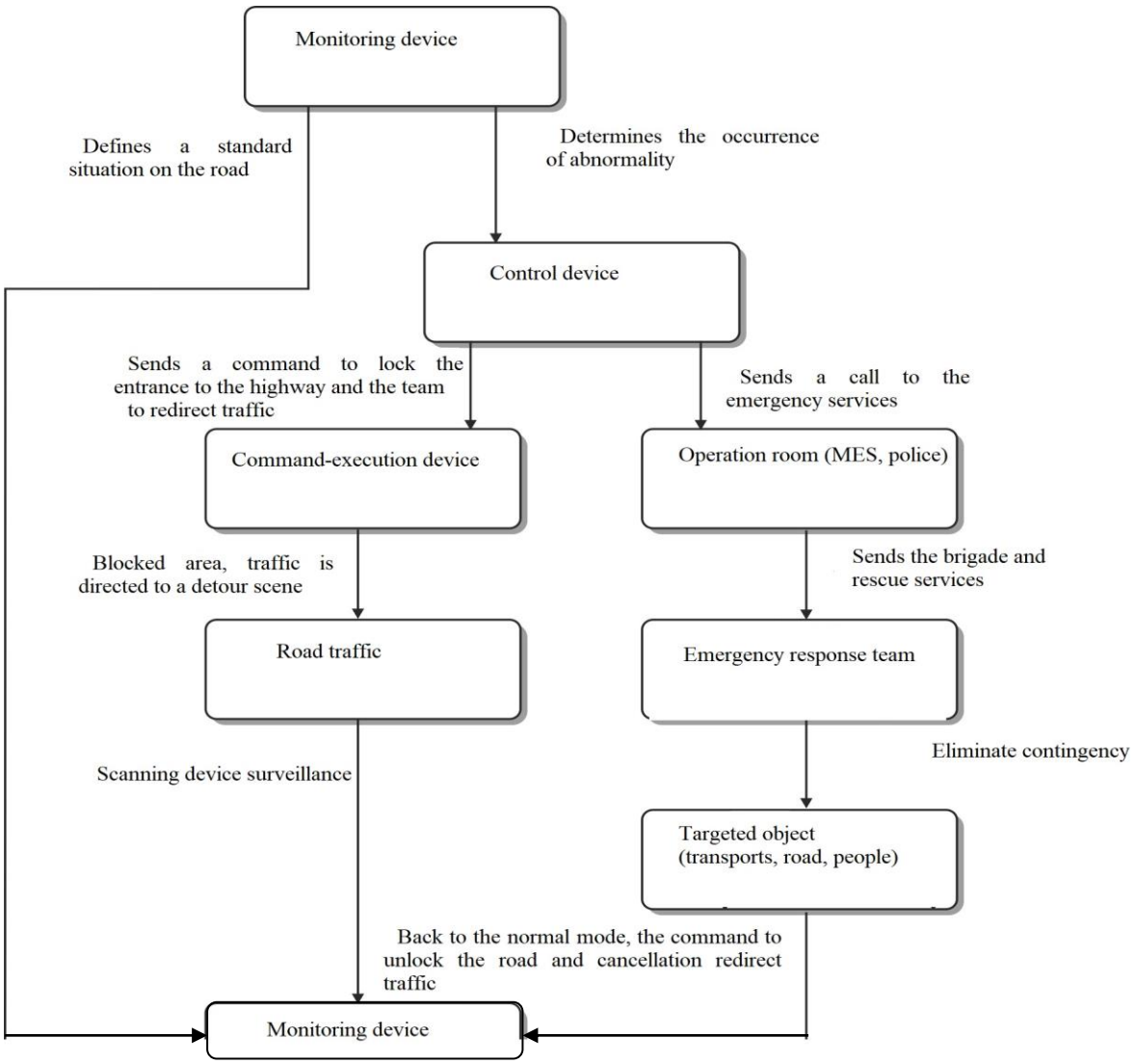

Figure 1. The sequence diagram of the control unit for road traffic in the Smart City Concept

The given examples describe the development of only some elements of the Smart City Concept, and it is precisely those elements that can be implemented without special costs in almost any city. Cities with large budgets, within the framework of the concept, are actively promoting the use of electronic identification of citizens for access to city services and services, but in cities whose budgets are small, such elements can appear very gradually and have limited functionality.

A complete transition to the concept cannot take place in two or three years. Its implementation requires certain costs, but the invested funds will ensure the safety of the most important thing that exists in the city - people whose living conditions will increase with each implemented element. As for today, many devices have been created to make life easier for their users - electronic queues, online receptions of state and municipal authorities, and many more practical solutions for different cases. But such devices at the administration level of the South Ural city are not used systematically, and this is what should be made by the city government. The implementation of the concept requires the development of a certain long-term plan, which should be based both on the city budget and on extra-

budgetary funds. To develop a project in the field of ideas one should attract caring citizens, the legislative municipal body must adopt an appropriate resolution and ensure financing of projects at the expense of the municipal budget, the city administration should take steps to attract volunteers to work on projects.

3. Conclusion

The results of the implementation of the Smart City Concept will become an economical advantage if the living conditions rate increases significantly. A clean city without traffic jams, water failures, unexpected electricity and Internet outages, having optimal heat supply modes and safe for life will be attractive not only for its residents (which in itself is important, because it will reduce the outflow of the local population), but it will also attract people from other regions, especially since the South Ural as a beautiful culture heritage could become one of the most admirable resort centers in the world.

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