

AIM

The main aim of this project is to show the smart city idea and use of technology in their management. Two selected Polish cities - Krakow and Warsaw will be analyzed in terms of implementing the concept of smart city and their image among the residents.

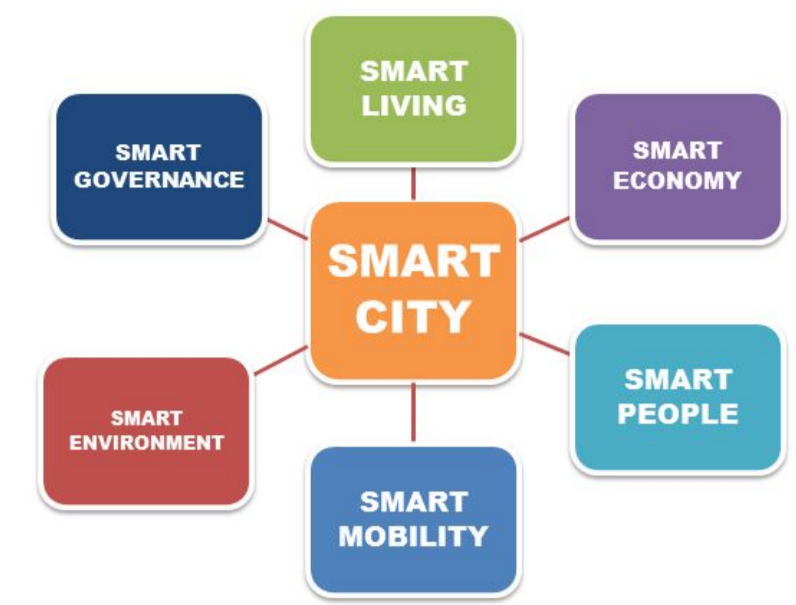
ABSTRACT

There is no doubt that the world is constantly moving towards increasing urbanization. Currently, cities that develop standard of living using modern technology in management process are referred to as smart. It has become a goal for more and more cities in the world, including Krakow and Warsaw. For the purpose of work, these two have been compared with other European cities striving to become smart. Studies have shown, that both of them achieve higher than average assessments of the use of technology in the development of the city's infrastructure, but Warsaw is ahead of Krakow in every field. It is a proof, that it has many areas in which it can still develop. However, to be able to achieve more, prudent management must go hand in hand with creative use of the opportunities offered by modern technologies.

INTRODUCTION

Smart City is a creative city strongly focused on development and innovation. It is a response to changing needs in various areas such as security, infrastructure, management, ecology and transport. A characteristic element of an intelligent city is the big role of advanced technologies. They enable the sustainable development of cities, reducing at the same time consumption of natural resources and improving in this way the quality of life of residents. A smart city is an ultra-modern urban area that addresses the needs of businesses, institutions, and especially citizens [Sikora-Fernandez, 2013, p. 84-85]. In order for cities to be considered intelligent, they must contain elements such as: smart economy, smart mobility, smart environment, smart people, smart living and smart governance [Gotlib, Olszewski, 2016, p. 23-25].

Figure 1. A smart city model



Source: Own elaboration.

An efficient smart city management policy should coordinate social, economic, spatial and environmental aspects. It requires the use of advanced technologies, stimulating innovation, economical use of local resources and effective cooperation between authorities and residents. Good management of a smart city also means clear management processes, rational development strategy as well as adequate and effective actions [Sikora-Fernandez, 2013, p. 87].

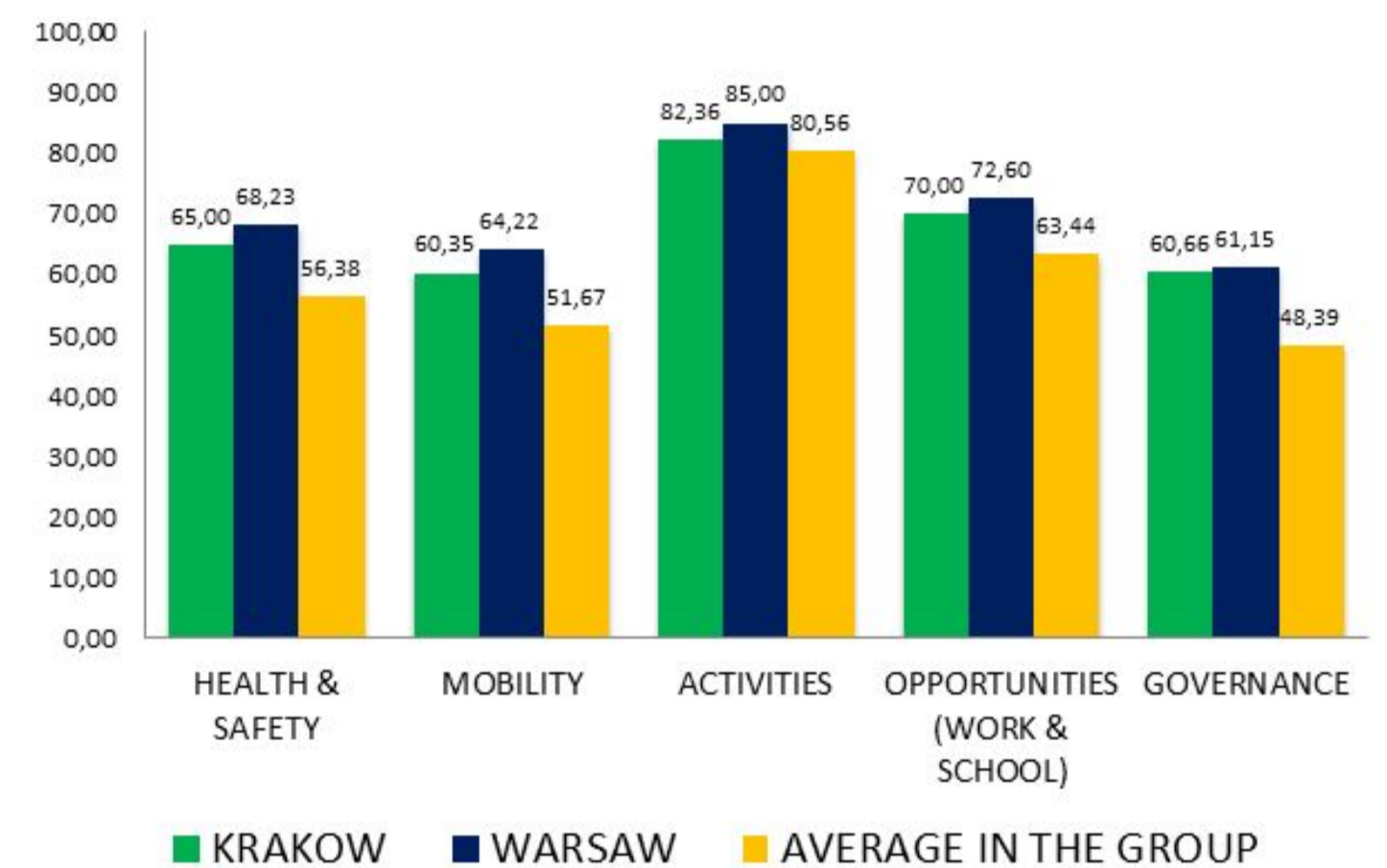
CASE STUDY

Warsaw become a significant center for the development of entrepreneurship, innovation and startups. Its initiatives – the Million Trees app, the Step by Step project or the modernization of the heating network affects the sustainable development of the city. Through the participatory budget and access to open data sets, Warsaw authorities stimulate creativity and engage residents in the technological progress of the city.

Many innovative solutions are introduced in Krakow to improve the lives of residents. In the city are used systems as TTSS – Tram Traffic Control System, UTCS – Urban Traffic Control System and Intelligent Lighting Control System. In use is also City Spatial Information System – website consisting of maps/applications available for citizens who can participate in surveys and submit comments regarding the development of the city's green areas.

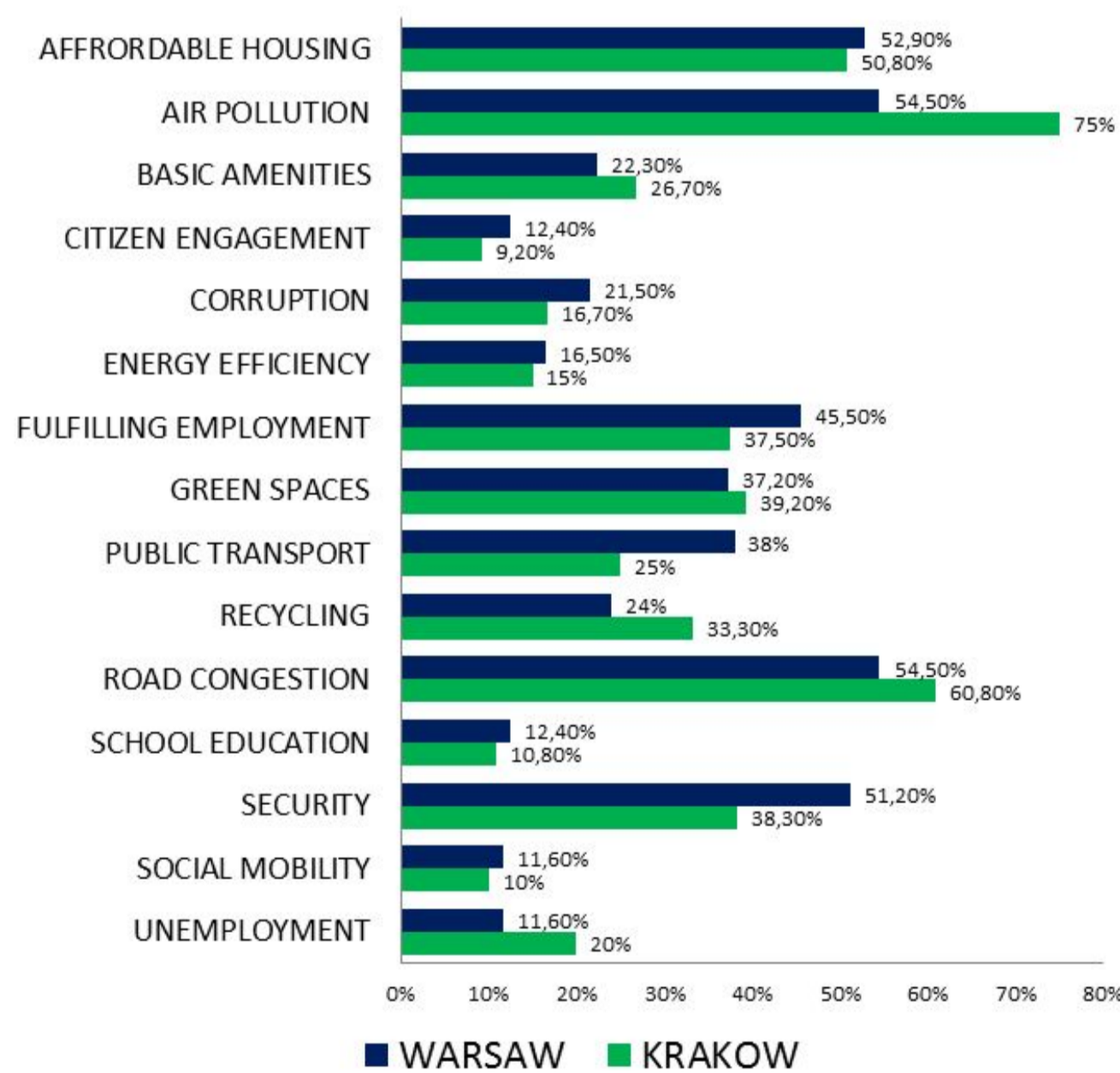
The IMD Smart City Index from 2019 is a rating of the city's perception of issues related to technological applications available to them. The study was conducted by recording the opinions of 120 city residents. In Smart City Ranking inclusive 102 cities, are found two Polish examples – Warsaw on 61st position and Krakow on 69th.

Figure 3. Comparison of Krakow, Warsaw and the average in 3. group



Source: Own elaboration based on IMD Smart City Index 2019.

Figure 2. Percent of respondents who choose the priority area



Source: Own elaboration based on IMD Smart City Index 2019.

(Figure 2) Respondents were asked to show the most significant categories for their city. The higher the percentage of responses per area, the greater the priority for the city. Based on the second chart, it can be concluded that the most important problems for the residents of Krakow and Warsaw are air pollution and road congestion due to excessive traffic. Although the city authorities are taking action in this regard, it is not enough for the residents. Housing prices are another important aspect for the inhabitants of both cities - over half of the respondents considered this area to be one of the priority. Important factors in Krakow include also: green areas, safety and job satisfaction, which obtained similar results. Since the green areas are a showcase of Krakow, their issue should be included in the further development of the city. On 4th place in Warsaw is safety. The next elements – satisfying work and public transport – are less important. In both cities, school education, citizen engagement and social mobility are not of great significance in opinion of residents.

(Figure 3) According to the IMD Smart City Index report, Krakow and Warsaw are in the third group with other European cities such as Athens, Bratislava or Lisbon. Ten cities were compared in 5 categories, obtaining points on a scale from 0 to 100. Krakow and Warsaw are above average in each field. It proves the relatively high rate of implemented smart idea. Polish cities stand out the most in the category of governance (around 11 points more), health and safety, and mobility (around 10 points more). The smallest difference among the scores regarding the activities category, may result from the fact, that most European cities have a well-developed cultural offer.

CONCLUSIONS

After analyzing the research carried out in Krakow and Warsaw regarding the implementation of smart city idea, it can be concluded that these two cities have similar problems, but use different solutions. There are imperfections arising in the process of implementing new technologies, but it is certain, that these cities are on the right track. It is especially shown by last year's Smart City ranking – Krakow and Warsaw took place in the third group of the smartest cities and achieved better scores than average in the group. To improve the position in the ranking, city authorities should allocate more funds to the implementation of modern technologies and use their potential. Residents should be encouraged to participate more in the city life, because it will depend on them only, to what extent their needs will be met and the standard of living will improve. We should observe further steps of implementing smart strategy in Krakow and Warsaw, because time will show to what extent their solutions can be called smart management.

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