

Smart Destination Concept: Example of the City of Zagreb

Zrinka Zadel

University of Rijeka, Faculty of Tourism and Hospitality Management, Croatia
zrinka.zadel@fthm.hr

Ivana Ivančić

University of Rijeka, Faculty of Tourism and Hospitality Management, Croatia
ivanai@fthm.hr

Antonio Badurina

antonio.badurina@gmail.com

Abstract. The concept of city management is a term that can be found in domestic and foreign literature and is commonly referred to as the smart city concept. Conferences have been conducted on this concept, numerous articles have been written, etc. The smart city concept encompasses sustainable development, smart and connected city systems, innovative approaches to solving urban problems, and city design. This concept focuses on finding ways to make it smart and appropriate, using the approach of developing and connecting innovative and technological solutions. It should be mentioned that there is no clear or unified definition of the concept of smart city. A smart city is based on several dimensions: Smart Economy, Smart Mobility, Smart Environment, Smart People, Smart Living and Smart Management. In this paper, a special focus is put on the City of Zagreb as an example of a Smart City (destination) in the Republic of Croatia. A working group of the City of Zagreb adopted a framework strategy for Smart City Zagreb and defined six strategic areas of this strategy: digital infrastructure; useful, transparent and smart city management; smart energy and utility management; education; economy; sustainable urban mobility. The stakeholders that should be involved in the "creation" of the smart city of Zagreb are citizens, the scientific community, entrepreneurs, business, industry, media, etc. It was noted that there are many smart solutions in the city of Zagreb, which prove that it is a smart destination, so this paper also mentions smart mobile solutions (applications) available to tourists and citizens of the City of Zagreb.

Keywords: smart destination concept, smart city, smart solutions, mobile applications, City of Zagreb

1 Introduction

A new concept of urban management can be found in the domestic and foreign literature. Such a concept is called the concept of smart city. The concept of a smart city and its scope are explained in many ways and directions.

Popular descriptions of the smart city concept include (Quora.com, 2017):

- sustainable development,
- intelligent and connected urban systems,
- innovative approaches to solving urban problems, especially in the communal part of the business,
- urban landscaping.

The whole concept of a smart city is designed and aims to apply an approach to develop and connect innovative and modern technological solutions in a smart and appropriate manner. Such solutions should help every individual in a city to have a better coexistence in the urban environment.

Citizens, on the other hand, represent the main benefits of modern cities for achieving economic growth and better quality of life (Dominik, 2017). Different priorities have been set in the development of smart cities around the world: In North America the focus is on smart networks, in Europe on regeneration and sustainability, in Asia the focus is more on urbanisation and e-governance issues, and in Latin America the focus is mostly on improving transportation (Dominik, 2017).

There are numerous definitions of a smart city in the literature, depending on the perspective from which it is viewed. Globally, different priorities have been set in relation to the development of smart cities. According to 2016 data, there are 10,000 in the world. Since 2010, the U.S. government, through the U.S. Department of Transportation, has invested approximately \$165 million in smart cities transportation solutions, and of this amount, \$65 million is funding from public sources, while other different funding sources are focused on technological development (Rijeka Smart City Strategic Plan 2019-2020, 2018).

This paper examines how City of Zagreb has implemented technological systems to transform itself into a Smart City and compete in the global knowledge economy. This paper aims to explore and demonstrate the transformation of a city into a Smart City while addressing the following research question: (1) What are the main goals in the future development of the City of Zagreb to become a smart city? (2) What strategy is considered in the development of the concept of "The Smart City of Zagreb"? (3) What are the objectives and strategic areas in the development of Zagreb as a Smart City? (4) What are the assets/infrastructures needed to become a Smart City?

In order to achieve the aforementioned goals, this article is structured as follows. First, the existing research on Smart Cities is presented. It continues with a description of the Smart City of Zagreb Framework Strategy, examining the main components of the strategy. The benefits and challenges of the Smart City initiative and its future are described. The paper concludes with the knowledge gained from the situation analysis of Zagreb as a Smart City. This paper contributes to knowledge by improving the understanding of the concept of Smart City.

2 Theoretical overviews of Smart Cities

Many definitions of smart cities can be found in the literature, depending on the aspect from which they are viewed. In addition, there are a number of terms associated with the smart city concept. For example, a connected city, a smart city, a digital city, a technocity, etc. (Caragliu, De Bo and Nijkamp, 2009). The following two definitions of a smart city are most commonly used:

- Smart City is a successful city built on a "smart" combination of means and activities of self-decisive, independent and conscious citizens (Giffinger, Fertner, Kramar, Kalesek and Pichler-Milanovic, 2007),
- a smart city is smart "when investing in human and social capital and traditional (transport) and modern (ICT) food communication infrastructure/drive sustainable economic growth and high quality of life, with wise management of natural resources, through participatory management (governance) (Caragliu and others, 2009).

In the literature, different concepts of the key dimensions of the smart city can be found, depending on how one views this concept. Caragliu et al. (2009) base the smart city definition on six dimensions, which are shown in the following Figure.

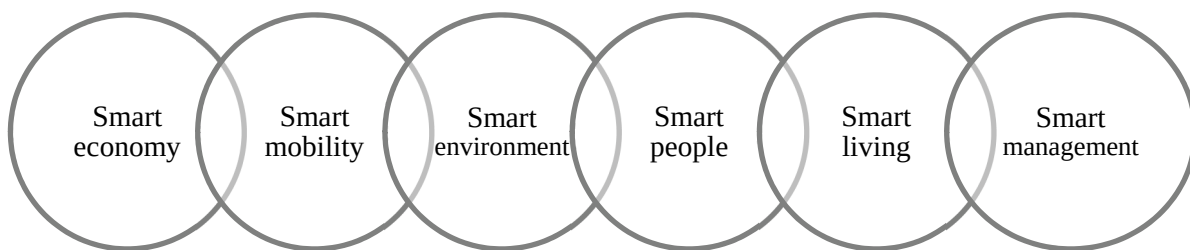


Figure 1 Smart city dimensions

Source: according to Caragliu et al. (2009)

Dameri (2013) points out that a smart city is not a top-down, but a bottom-up concept, as the concept of a smart city stems from how technology is used to solve urban problems.



Figure 2 Bottom-up concept

Source Dameri, R. P. (2013): Searching for Smart City definition: a comprehensive proposal, International Journal of Computers & Technology, Council for Innovative Research, Vol. 11, No. 5, pp. 2544-2551

Table 1 Smart city definitions

Definition	Source
Smart City is a highly technologically intensive and advanced city that connects people, information and urban elements, using new technologies to create a sustainable, greener city, competitive and innovative trade and increased quality of life.	
Smart cities are those that use all available technology and resources, and those who develop urban centres in an intelligent and coordinated way. These are integrated, habitable and sustainable cities.	Barrionuevo et al. (2012)
The city is smart when investments in human and social capital, as well as traditional transport and modern ICT infrastructure are sustainable, with present economic growth and high quality of life, and wise management of natural resources, through participatory management.	Caragliu et al. (2011)
Smart cities take advantage of communications and sensors in the city's infrastructure to optimize electricity, transport and other logistics operations that support daily life, thus improving quality of life for all.	Chen (2010)
There are two main research routes in the smart cities concept: 1) smart cities connect the economy with the use of new thinking paradigms, 2) Smart Cities concerned networks of sensors, smart devices in real time, data and the integration of ICT technologies into every aspect of human life.	Cretu (2012)
A smart community – a community that consciously decides to aggressively implement technology, as a catalyst, in addressing its social and business needs. It undoubtedly focuses on building high-speed broadband infrastructure, but the real opportunity is in rebuilding and restoring the sense of place, while in the process there is a sense of civic pride. Smart communities are not essentially an exercise in deploying and using technology, but are at the heart of promoting economic development, work, growth and increased quality of life. In other words, the technological expansion of smart communities is not the goal itself, but merely a means to invent cities for a new economy and society.	Eger (2009)
Generally speaking, a smart city refers to the search and identification of intelligent solutions that enable modern cities to improve the quality of services provided to citizens.	Giffinger et al. (2007)
A smart city is ready to provide conditions for a healthy and happy community, with all the challenges and conditions that global, environmental, economic and social trends bring.	Guan (2012)
A city that oversees and integrates all critical infrastructure conditions, including roads, bridges, tunnels, rails, subways, airports, seaports, communications, water, electricity and even large buildings, to better optimise resources, plan preventive maintenance activities and monitor security aspects, while maximising services to its citizens.	Hall (2000)

A city that connects physical infrastructure, IT infrastructure, social infrastructure and business infrastructure that affects the collective intelligence of the city.	Harrison and al. (2010)
Smart cities as areas with high capacity for learning and innovation, built into the creativity of their population, their institutions, knowledge creation, etc.	Komninos (2011)

Source: Authors' edition

3 The Smart City of Zagreb Framework Strategy

In October 2018, the Working Group for the Development and Implementation of Smart City Projects - Zagreb Smart City, adopted the Smart City of Zagreb Framework Strategy - Zagreb Smart City, and based on the current situation, set goals and determined the strategic areas of future development of the City of Zagreb towards a Smart City. Furthermore, for each strategic area, priority measures and activities are defined that should be implemented if the set goals are to be achieved.

Primarily, through an initiative of the European Union called EIP-SCC - European Innovation Partnership on Smart cities and Communities, this Framework Strategy focuses on several strategic areas (The Smart City of Zagreb Framework Strategy – Zagreb Smart City, Vision until 2030, 2018) indicated in the following Figure.

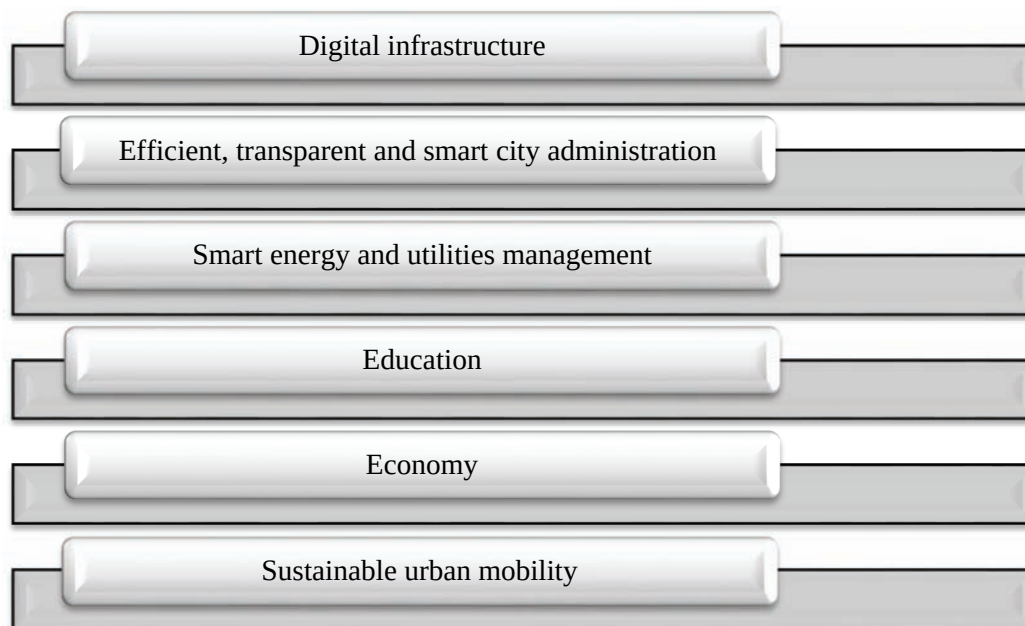


Figure 3 Strategic areas of Framework strategy

Source: The Smart City of Zagreb Framework Strategy – Zagreb Smart City, Vision until 2030 (2018)

Digital infrastructure and efficient, transparent and smart city governance, as the first two strategic areas of the Smart City of Zagreb Framework Strategy, form the basis of the necessary conditions for the development and expansion of various smart solutions, as well as applications and technologies in other areas. Achieving the goals and taking full advantage of the opportunities offered by smart solutions and technologies can be achieved through the active participation of all key stakeholders, including entrepreneurs, business or industry, citizens, the scientific community, and the media, with the imperative to establish communication among them.

This framework strategy takes into account horizontal areas, such as financial mechanisms, as well as instruments to finance the implementation of measures, mitigation and adaptation to the adverse effects of climate change, as shown in the Figure below.

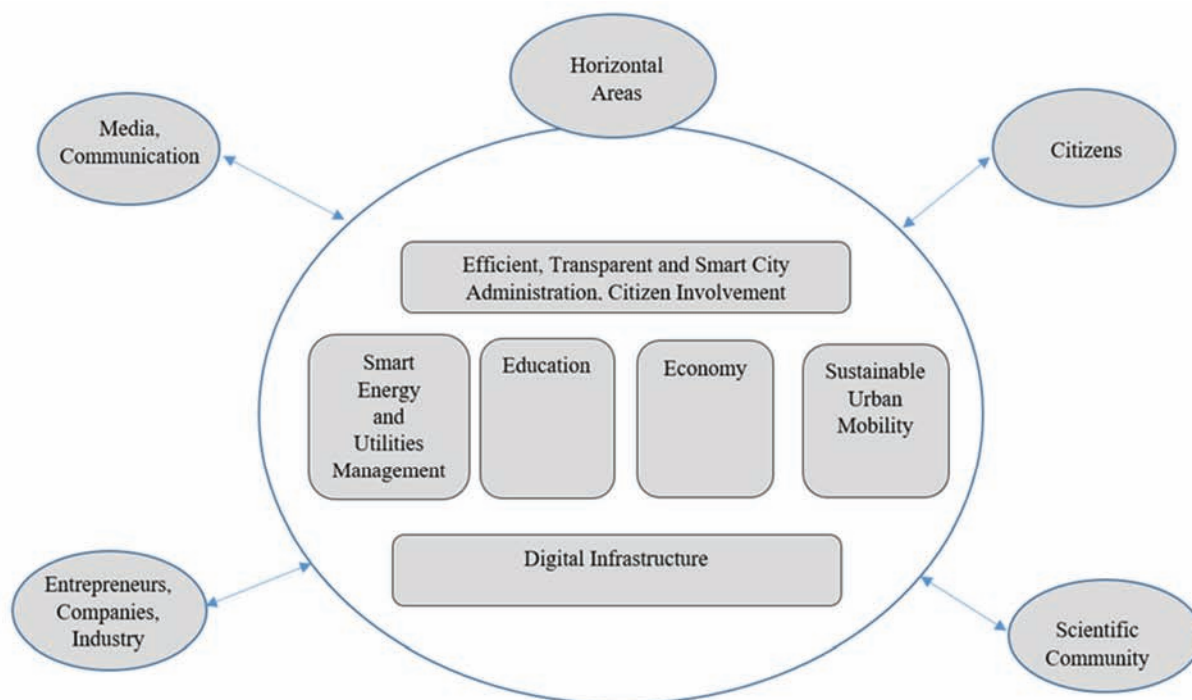


Figure 4 Strategic areas and key stakeholders of Framework strategy of the Smart City of Zagreb

Source: The Smart City of Zagreb Framework Strategy – Zagreb Smart City, Vision until 2030 (2018)

The main objectives set by the Smart City of Zagreb Framework Strategy (2018) are as follows:

- increasing quality and standards of living,
- strengthening the competitiveness of knowledge-based and innovation-based economies,
- further developing and increasing the availability of digital infrastructure,
- making the most of ICT potential for development,
- improving sustainable use of natural resources and making effective adjustments to the effects of climate change.

As the most important and comprehensive part in The Smart City of Zagreb Framework Strategy, specific actions should be identified, i.e. activities that need to be carried out if the vision and objectives set in strategic areas are to be achieved. A total of twenty-seven priority actions are envisaged, grouped according to the strategic areas shown in the Figure below.

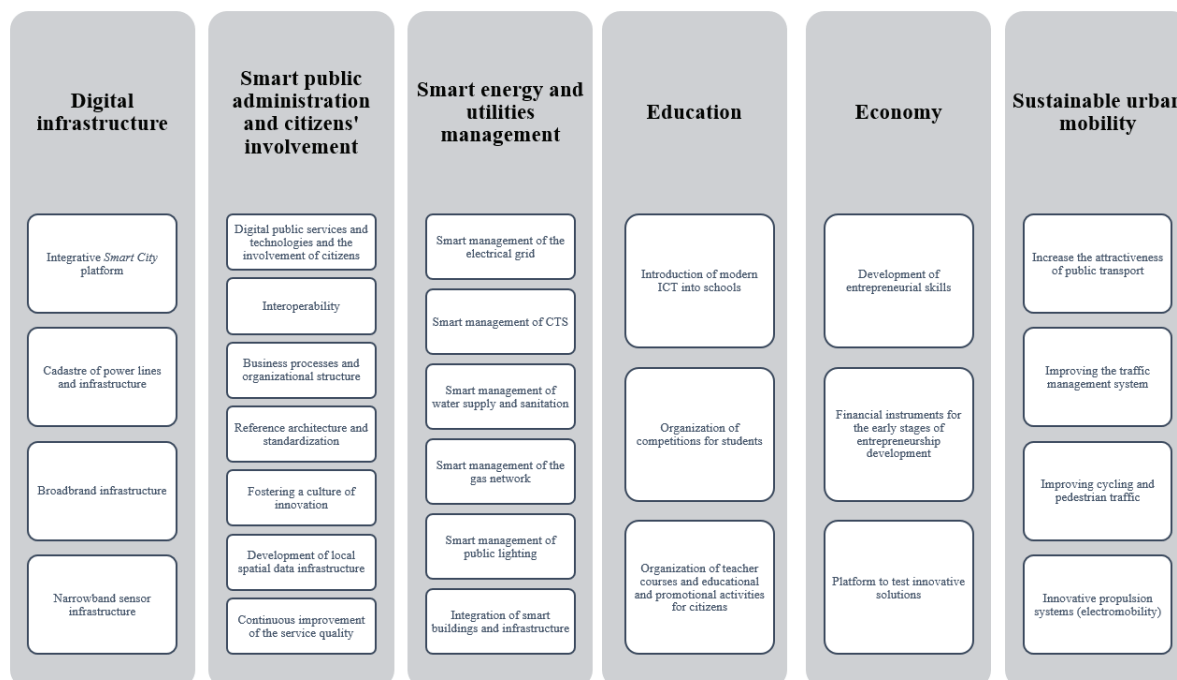


Figure 5 Presentation of the priority actions of the Framework Strategy grouped by strategic areas
Source: The Smart City of Zagreb Framework Strategy – Zagreb Smart City, Vision until 2030 (2018)

The Framework Strategy focuses primarily on ICT and digitisation and on promoting the development of the smart city concept. Therefore, such document is complementary to other strategic and implementing documents of the City of Zagreb, referring to the following documents: Zagreb City Development Strategy for the period until 2020, the Urban Agglomeration Zagreb Development Strategy, the Energy Sustainable Development Action Plan of the City of Zagreb - SEAP, the Master Plan of Transport of the City of Zagreb, etc.

In this way, the Framework Strategy of the Smart City of the City of Zagreb is a link to specialised sector plans and programmes, some of which already exist and others still need to be developed, such as Action Plan for Energy Sustainable Development and Climate Change Adaptation of the City of Zagreb (SECAP) (The Smart City of Zagreb Framework Strategy - Zagreb Smart City, Vision by 2030, 2018).

4 The City of Zagreb as a smart destination

The City of Zagreb is facing certain challenges resulting from the growth and ageing of the population, increasing demand for mobility, increasing pressure on the city's resources in terms of energy and water consumption, increasing demand for jobs and increasing cost of living, which brings the need to find solutions that respond to the new needs of citizens and enable sustainable development of the city (The Smart City of Zagreb Framework Strategy - Zagreb Smart City, Vision by 2030, 2018). Increasing demands are being placed on existing urban infrastructure due to the rise in urban population, and this infrastructure has a limited capacity and lifespan, creating new challenges to the basic functioning of city life.

Increasingly complex requirements prevail in the field of urban planning, as well as in the fields of transport infrastructure, public transport, water supply, energy supply, adaptation to climate change, environmental protection, sustainable waste management, etc. For this reason, there is also a need to

develop intelligent solutions in the City of Zagreb. However, it should be noted that it is not sufficient and possible to simply copy the existing solutions of some other cities and apply them only to the City of Zagreb, but it is necessary to search for new solutions that would be fully adapted to the City of Zagreb and the needs of its citizens or population.

The main purpose of Smart Cities is to provide an optimal quality of life for all citizens in combination with the highest possible level of resource conservation, i.e. this is what the City of Zagreb strives for, and this can only be achieved through innovative urban management or the development of useful solutions based on real data and information from urban life using communication technologies, in a way they do (The Smart City of Zagreb Framework Strategy - Zagreb Smart City, Vision by 2030, 2018):

- they connect different sources of information by enabling synergy effects,
- achieve a high level of efficiency and resource conservation through integrated approaches,
- and involve citizens and investors in the development of the city to make it as attractive, sustainable, resilient and committed to improving the quality of life as possible.

The Smart City of Zagreb Framework Strategy (2018) states that "the smart City of Zagreb therefore implies a place of high quality of life and a competitively capable economy, which can only be achieved through the continuous development of new innovative solutions in all areas essential for the development of the city, with advanced integrated digital and communication technologies playing a key role".

4.1 Situational analysis

It is considered that the City of Zagreb has exceptional potential in terms of realizing all aspects of the Smart City. Namely, the existing urban infrastructure, the environment and the share of green areas in the total area of the city, recreational zones, water supply, waste and wastewater management, transport and the level of ICT integration in all sectors provide a very good starting point for further progress in terms of development and implementation of smart solutions (The Smart City of Zagreb Framework Strategy - Zagreb Smart City, Vision 2030, 2018).

Numerous faculties within the University of Zagreb are intensively engaged in the development and application of smart solutions in all areas of life. For example, the Faculty of Electrical Engineering and Computer Science and the Faculty of Mechanical Engineering and Shipbuilding. Within the many projects already implemented and in the process of implementation, the faculties in Zagreb have already achieved significant results. There are also strong opportunities for improving existing cooperation and joint work and development of smart solutions, applications and devices between the University of Zagreb, the City of Zagreb and municipal companies.

The company APIS IT is also an important potential for the City of Zagreb. It is also of strategic interest for the Republic of Croatia and is co-owned by the City of Zagreb. APIS IT is an information systems and information technology support agency that provides strategic, professional and implementation services to the public sector of the Republic of Croatia in the design, development, support and maintenance of business information systems on the principles of networked and user-centric management.

The City of Zagreb is the economic and political center of the Republic of Croatia. At the same time, it can be said that here is the strongest economic center of Croatia, where one third of the national GDP is generated (Zagreb City Development Strategy for the period until 2020). A significant number of companies that have a headquarters or branches in Zagreb are engaged in the development and application of smart solutions, applications and devices focused on ICT (e.g. HT, IBM, Microsoft,

Transmitters and Connections, but also a large number of small and medium enterprises), some of which have already been applied in Zagreb, but also in other Croatian cities (The Smart City of Zagreb Framework Strategy - Zagreb Smart City, Vision by 2030, 2018).

In order for Zagreb to become a Smart City in the full sense, strong cooperation on the private and public sectors is required. The quality of life of the inhabitants of the City of Zagreb is certainly contributed by the large amount of green spaces, city parks, cultural facilities, health facilities, etc. Citizens of the City of Zagreb. Although the citizens of the City of Zagreb are involved in certain decisions regarding their city, their stronger participation is certainly needed to realize the full potential of the Smart City.

As for the administrative view, the City of Zagreb is divided into municipal districts and local committees. In order to involve citizens as much as possible in projects, programs and other activities related to their city, the Municipality of the City of Zagreb has launched numerous initiatives and projects in which it uses ICT, and thus examples of smart solutions have been implemented. Here one can mention MojZagreb - the central place of access to all e-services provided by the City of Zagreb to its citizens, and the pilot project Zagreb - Innovative City and others (The Smart City of Zagreb Framework Strategy - Zagreb Smart City, Vision by 2030, 2018).

4.2 Objectives and strategic areas in achieving Zagreb as a smart city

The three key objectives to be pursued by the smart City of Zagreb are the following (The Smart City of Zagreb Framework Strategy – Zagreb Smart City, Vision by 2030, 2018):

- achieve sustainable development
- improve the quality of life of its inhabitants
- improve the efficiency of the city as a system (through increasing the efficiency of existing and future infrastructure by connecting its various components, services provided and the people who use it).

Sustainability, efficiency and high quality of life for the inhabitants of the City of Zagreb are to be achieved through six dimensions or fields of action. These are specific aspects of the City of Zagreb that influence the achievement of the objectives of the Smart City Strategy through smart initiatives. A smart initiative or project becomes smarter the greater the number of action fields, of which six are key (The Smart City of Zagreb Framework Strategy - Zagreb Smart City, Vision by 2030, 2018):

- smart management
- economy
- mobility
- environment
- life
- people.

The further development and sustainability of the City of Zagreb should be based on a combination of new technologies, with a special focus on information and communication technologies, as well as on the integrated platform of the City of Zagreb, new design of digital services, modern infrastructure, interconnection of smart electrical grids, internet, etc.

The city of Zagreb will be profiled on the digital map of Europe as a regional digital innovation centre that has (The Smart City of Zagreb Framework Strategy – Zagreb Smart City, Vision until 2030, 2018):

- availability of highly educated staff

- positive investment climate and regulated infrastructure
- enviable business culture
- development platforms that create space for innovation and development
- high availability of open data and robust mechanisms for their security and protection.

In order to realise the vision of the City of Zagreb as a Smart City, activities and initiatives were designed for six strategic areas, which are presented in the following table:

- Digital infrastructure
- Efficient, transparent and smart city management
- Smart energy and utilities management
- Education
- Economy
- Sustainable urban mobility.

Table 2 Activities and initiatives within strategic areas

Field 1: Smart living		
Area	Activity	Initiative
Digital infrastructure	-Smart City platform of the City of Zagreb - Integral Geo Information System -Gigabit user broadband infrastructure -Seasonal narrowband infrastructure	-platform for data aggregation with real-time data exchange -establishing systems and creating application solutions for data collection -inclusion within the integral Geo information system of all elements of the city's transport system -building quality urban broadband infrastructure
Field 2: Smart management		
Area	Activity	Initiative
Efficient, transparent and smart city administration	-Accelerating the development of digital public services, increasing the absorption of digital technologies and involving citizens -Managing interoperability of city electronic services -Analysis and elaboration of business processes and establishment of an appropriate organizational structure -Development of reference architecture and technology platform standardization, etc.	-e-democracy and e-participation, participatory tools (Wiki, online social networks, blogs), electronic voting, reputational systems, online petitions, complaints and requests, collaborative creation of services -transparency tools -e-city districts -policies and measures that strengthen smart city initiatives
Field 3: Smart environment		
Smart energy and utilities management	-Smart electrical grids -Smart lighting -Smart heat grids -Smart gas networks	-Installation of smart and measuring and control devices at the level of high, medium and low voltage electricity grid

	-Smart water supply and drainage - Integration of smart buildings and infrastructure	-Networked smart lighting system two-way available for communication and control from the computer cloud -Networked smart heating and cooling systems for all categories of consumers -Interaction of buildings - consumers (consumers who are also energy producers) and networks for better integration of renewable energy sources
Field 4: Smart people		
Area	Activity	Initiative
Education	-Introduction of modern ICT -Organization of regular competitions for primary and secondary school students in the area of the City of Zagreb -Organization of regular courses (lectures)	-Educational programmes and centres for new technologies, internet in schools, technology devices in schools and colleges, facilitating and encouraging lifelong learning, interactive panels, e- learning systems -Organization of competitions in the development and application of ICT solutions and tools -Organization of regular courses or lectures for teachers in primary and secondary schools, in cooperation with experts from leading companies in the field of smart solutions development and ICT technologies

Source: The Smart City of Zagreb Framework Strategy – Zagreb Smart City, Vision until 2030, 2018.

4.3 Mobile apps as smart solutions in The City of Zagreb

Balakrishna (2012) argues that the advancement of mobile communication technologies has enabled "Anytime, Anywhere" access to information and related services. Today's smartphones are an ideal candidate to catalyse smart applications and services. This is exactly the basis for incorporating mobile applications into the smart solutions system for the City of Zagreb.

There are many smartphone apps active in the City of Zagreb that make it even easier to get around the city and make the City of Zagreb a smart destination with smart solutions. These are the following smartphone apps:

- Zagreb Be there,
- VoiceGuide Zagreb,
- Moj ZAGREB,
- ZgPark,
- OROUNDO Mobile GmbH,

- Vollo – autobusne, trajektne i karte za vlak,
- ZAGREB360,
- Pozdrav iz Zagreba,
- Like A Local Offline City Guide,
- Spotted by Locals Zagreb,
- Zagreb Food,
- DiVan,
- CRO360,
- FLOU,
- SightRun,
- Enjoy the best of Zagreb,
- Hrvatski zvukopis,
- Zagreb Rutmap,
- ZAGREB WALK.

Zagreb Be there represents an app that guides its users to what are called insider slots. Users can share their research experiences on social media. This mobile app for tourists competes with thirty cities from twenty European countries. At the first European tourism promotion festival Tourism & Strategy in Paris, the Zagreb Be there mobile app won the award for the best digital tourism promotion project in Europe. It is a project of Zagreb Tourist Board, created in cooperation with agencies Bruketa Žinić OM and Brlog. The app allows tourists to visit the city with their smartphones, and besides the classic tourist places, the special features of this app are specially designed thematic routes that show tourists less known and equally interesting places in the city. The app Zagreb Be works there on iPhone and Android mobile systems, and tourists who use it sign in virtually every place they arrive, and when they complete the route, they wait for their reward in the form of discounts on tickets, etc. The app is based on the so-called gamification principle, which transfers the rules and modes of interaction from video games to the real world. The app can be downloaded from the website betherezagreb.com or via the code QR on the brochures located at numerous tourist points in the city of Zagreb.

VoiceGuide Zagreb is the first voice guide for tourists in the City of Zagreb. It is an offline app, and this means that it is enough to set up the app only once on a mobile device, while any further use does not require access to an internet connection, so there are no additional financial expenses associated with this app. This VoiceGuide offers soundtracks to all the sights of the City of Zagreb, as well as a lot of other interesting and useful information, and the app is always up to date. The VoiceGuide Zagreb app includes a map of the destination with a map of public transport, a large number of photos, information about opening hours and ticket prices for museums and similar institutions. The app is suitable for deaf and visually impaired people, as the information is available in both audio and text form. Therefore, it can also be used by people who have difficulty moving around, as it is not necessary to hold the mobile device on which the app is installed in your hands when starting the app. The VoiceGuide Zagreb app is adapted to work on different types of mobile devices and tablets that use the Android or iOS operating system. In closed spaces where GPS signal is not available, this app uses the codes QR, so a combination of QR and GPS is the ideal solution. Those users who do not have GPS on their mobile devices can download the app using QR codes that are set up throughout the city of Zagreb, in which case they can use the app partially in automated mode, also completely free of charge. The users of this site have the possibility to enter their own locations in the app, all so that they can later orient themselves and return to their interesting attractions, places and localities.

MojZagreb is a free app for the citizens of the City of Zagreb, through which one can access various electronic services of the City of Zagreb. The electronic services are divided into seven areas of activity and the user can register in such a service through the National Identification and Authentication System

(NIAS). When using this application, the user registration is stored and further forwarded to all electronic services used by NIAS.

The **ZgPark** mobile app is an app used primarily for the purchase, payment and surcharge of parking tickets in public parking lots and public garages in the City of Zagreb (e.g. Rebro, Kvaternikov Trg, etc.). This application supports the functionality of entering vehicle license plates, entering and selecting parking tickets, managing user data and bank cards. The ZgPark app enables tracking of all user transactions related to purchased parking tickets (e.g. transaction history, last purchased parking tickets). To install this app, you must have internet access on your mobile phone.

OROUND0 Mobile GmbH Uses the app for tourists to explore museums and other attractions in the City of Zagreb. In fact, with this application you can explore all cultural attractions in the city of Zagreb (but also in other famous cities) with the help of the Oroundo platform. The OROUND0 Mobile Ltd app offers media guides for selected institutions in the City of Zagreb, as well as exciting audio city guides.

Vollo is a search platform that connects hundreds of bus operators in Croatia and Europe. In one place tourists have the opportunity to search, compare and book, find the best options and pay over the internet. Citizens and tourists can purchase bus and ferry tickets through this app, as well as train tickets.

The **Zagreb360** mobile app presents a virtual walk of objects in the City of Zagreb and a modern city guide. Restaurants, cafes, beauty salons, hotel accommodation, apartments and hostels can be found in this app. It is also possible to search for current events in the city of Zagreb, as well as indoor spaces where various events are currently taking place. The idea is to use navigation to find a way to your destination. Therefore, users of this app can be informed about all the information about the object, go through the virtual walkable objects, events and photo gallery. The research/search options also include monuments, museums, parks, architecture etc.

The mobile app **Pozdrav iz Zagreba (Greeting from Zagreb)** is an innovative digital product that combines tourism and cultural heritage, promoting the beauty of the capital captured on postcards from Graphic Collection Fund of the National and University Library in Zagreb. The target audience of this application are Zagreb citizens and their visitors, as well as all other lovers of Zagreb's squares and streets. Users of the mobile app Greetings from Zagreb can discover the past of attractive places in the City of Zagreb, send digital postcards and use many other functionalities of this app.

Like A Local Offline City Guide helps users avoid tourist traps and find interesting hidden places that the citizens of Zagreb love.

The **Zagreb Food** mobile app is an app that combines the culture of the City of Zagreb with world-renowned gastronomy and modern technology into a design and functional whole. This app provides an overview of restaurants and other gastronomic establishments in the City of Zagreb. The focus is on new and interesting gastronomic objects. The main function of the mobile app Zagreb Food is the systematic overview of all objects on Google Map. Thus, one can click on each object and see the information about it.

DiVan is a mobile app for using information about appointments and events in the city of Zagreb. With this app you can find completely free information about concerts, performances, clubs, gastro events and others in the City of Zagreb. The application is in Croatian language. The app contains a list of events and places in the City of Zagreb, and the map shows the distance of these events and places from the user using this app.

CRO360 introduces an app that allows you to search geographically and thematically and virtually walk through tourist, gastronomic and sacral places, as well as those that present the cultural and natural heritage of the Republic of Croatia. Information about logistically significant points, such as ATM networks, exchange offices, health centers, tourist offices, information centers, etc. Information about working hours, prices, taxi services, etc. can be found in the app.

The **Flou** mobile app serves the user for easy selection of sports activities by offering many workout options depending on the desired workout type, location and time. This app is designed for all users who are interested in sports and healthy lifestyle. The app combines the offer of sports, sports centers, trainers and teachers in the City of Zagreb. The registration process is simple. The user should choose the type of training, perform the desired transaction and collect points. Moreover, this app reminds the user about the recent expiration of his membership and further encourages him to use everything he has chosen in a certain period of time. On signing up to this app, the user will earn additional points that can be redeemed at any sports center that is on the Flou Mobile App list.

5 Conclusion

The concept of managing cities, the so-called smart city concept, is a term that is defined in domestic and foreign literature, but there is no unified definition of this term. Moreover, it is defined according to the aspect from which it is considered. Sustainable development, smart and connected urban systems, and innovative approaches to solving urban problems are characteristics of this concept. Some authors consider that a smart city is not the same as a smart destination. What they all basically have in common are smart solutions. Smart cities use a combination of means and activities, i.e. they are based on information and communication technologies. There are six dimensions of a smart city: Smart Economy, Smart Mobility, Smart Environment, Smart People, Smart Living and Smart Management.

The Task Force for the Development and Implementation of Smart City Projects - Zagreb Smart City adopted the Smart City of Zagreb Framework Strategy - Zagreb Smart City in 2018 after looking at the current situation. The Task Force has set goals, strategic areas for the future development of the City of Zagreb, towards a Smart City. The strategic areas of this Framework Strategy are digital infrastructure; efficient, transparent and smart city administration; smart management of energy and utilities; education; economy; sustainable urban mobility. Entrepreneurs, companies, industry, academia, citizens and media are the stakeholders of this strategy. The main objectives of this Framework Strategy, which relate to a smart city, include increasing the quality of life and standard of living of the citizens of the City of Zagreb, strengthening the competitiveness of a knowledge-based economy and innovation, further developing and increasing the availability of digital infrastructure, etc. Priority actions are defined for each of these strategic areas.

The City of Zagreb has exceptional potential in realizing all aspects of the smart city. This paper identifies the smart solutions in the City of Zagreb, with a special focus on mobile applications that serve tourists and citizens of the City of Zagreb to find their way around the city more easily. Such applications apply to historical and cultural sites and various localities, sports and other events, etc.

ACKNOWLEDGEMENTS

This paper has been financially supported by the University of Rijeka, for the project ZP UNIRI 7/18

List of references

- App Store, <https://apps.apple.com/hr/app/mojzagreb/id660232620?l=hr>
- APIS IT, <https://www.apis-it.hr/apisit/index.html#/page?docId=862092FC53B6F468C1257F400043EACF>
- Aplikacijski sustav odgojno-obrazovnih ustanova Grada Zagreba, Korisnička dokumentacija, 2009., <http://www.os-tujevica-zg.skole.hr/docs/GUOKS%20Aplikacija%20-%20Upute%20-%20Pedagoski%20modul%20-%20Skole.pdf>
- Barrionuevo, J. M., Berrone, P., Ricart, J. E. 2012. *Smart Cities, Sustainable Progress*, IESE Insight.
- Best Zagreb, Aplikacija 'ZAGREB BE THERE' je najbolja u Europi, <https://www.zagreb.in/best/aplikacija-zagreb-be-there-je-najbolja-u-europi/>
- Caragliu, A., de Bo, C., Nijkamp, P. 2009. *Smart cities in Europe*, 3rd Central European Conference in Regional Science.
- Caragliu, A., Del Bo, C., Nijkamp, P. 2011. *Smart Cities in Europe*, Journal of Urban Technology.
- Chen, A. 2010. *Smart Grids, Smart Cities Need Better Networks*, IEEE Network.
- Cretu, L. G. 2012. Smart cities design using Event-driven paradigm and semantic web, https://www.researchgate.net/publication/312371159_Smart_cities_design_using_Event-driven_paradigm_and_semantic_web/citation/download
- Dameri, R. P. 2013. *Searching for Smart City definition: a comprehensive proposal*, International Journal of Computers & Technology, Council for Innovative Research, Vol. 11, No. 5.
- Dominik. 2017. Što čini neki grad Pametnim gradom?“, <https://www.digitalizacija-hrvatske.info/sto-cini-neki-grad-pametnim-gradom/>
- Eger, J. M. 2009. *Smart Growth, Smart Cities, and the Crisis at the Pump A Worldwide Phenomenon*, I-Ways.
- Flou, <http://flou.hr/ekrani/>
- Giffinger, R., Fertner, C., Kramar, H., Kalessek, R., Pichler-Milanović, N., Meijers, E. 2007. *Smart Cities: Ranking of European medium-sized cities*, http://curis.ku.dk/ws/files/37640170/smart_cities_final_report.pdf
- Grad Zagreb, Službene stranice, <https://www.zagreb.hr/mreza-osnovnih-skola-grada-zagreba/11581>
- Google Play, <https://play.google.com/store/apps/details?id=matrix00.zagreb360>
- Google Play, <https://play.google.com/store/apps/details?id=com.ttkalcevic.zagrebfood&hl=hr>
- Guan, L. 2017. *Smart Steps To A Battery City*, Government News.
- Hall, R. E. 2000. *The Vision of a Smart City*, Proc. of the 2nd International Life Extension Technology Workshop, Paris, France.
- Harrison, C., Eckman, B., Hamilton, R., Hartswick, P., Kalagnanam, J., Paraszczak, J., Williams, P. 2010. *Foundations for Smarter Cities*, IBM Journal of Research and Development.
- Journal, Voice Guide Zagreb, <http://www.journal.hr/lifestyle/voiceguide-zagreb-prvi-glasovni-vodic-po-zagrebu/attachment/voiceguidezagreb/>
- Komninos, N. 2011. *Intelligent Cities: Variable Geometries of Spatial Intelligence*, Intelligent Buildings International.
- Nacionalna i sveučilišna knjižnica u Zagrebu, <http://www.nsk.hr/nacionalna-i-sveucilisna-knjiznica-u-zagrebu-predstavila-svoju-prvu-mobilnu-aplikaciju-pozdrav-iz-zagreba>
- Quora, What is the concept of smart city?, 2017., <https://www.quora.com/What-is-the-concept-of-a-smart-city>
- Okvirna strategija pametnog Grada Zagreba – Zagreb Smart City, Vizija do 2030. godine, Radna verzija, 2018.,
- Oroundo, <https://oroundo.com/>
- Pozdrav iz Zagreba, <http://pozdravizhrvatske.nsk.hr/zagreb>
- Strategija razvoja ljudskih potencijala Grada Zagreba 2017. - 2020., Zagreb, 2017., http://www.skupstina.zagreb.hr/UserDocsImages/popis_vazecih_propisa/Strategija%20razvoja%20ljudskih%20potencijala%20GZ%202017-2020.pdf

Strateški plan Rijeka Pametan grad za razdoblje 2019.-2020. godine, Rijeka 2018., <https://www.rijeka.hr/wp-content/uploads/2018/11/Strate%C5%A1ki-plan-Rijeka-Pamet-an-grad-za-razdoblje-2019.-2020.-godine.pdf>

Zagreb, <http://www.infozagreb.hr/istrazi-zagreb/aplikacije>

Zagrebački holding, <https://www.zagrebparking.hr/djelatnosti/javna-parkiralista/nacini-placanja-parkiranja/mobilna-aplikacija-zgpark/337>

Zagrebački holding, O aplikaciji, <https://www.zagrebparking.hr/UserDocsImages/upute/Korisni%C4%8Dke%20upute%20ZgPark.pdf>