ZAGREB SMART CITY

ZAGREB –A CITY OF FUTURE

Zagreb Smart City Framework Strategy

– Summary

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ZAGREB −A CITY OF FUTURE

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Zagreb, 2019

ZAGREB SMART CITY FRAMEWORK STRATEGY

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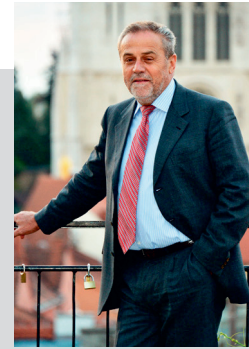*Dear citizens,*

The growth and ageing of the city of Zagreb population, the increased pressure on city resources such as energy, food and water consumption, the higher demand for employment and the rising life costs all impose the need for solutions that address the citizens' new needs and make the city's sustainable development possible.

Demands in urban planning, traffic infrastructure, public transport, water and energy supply, environment protection, sustainable waste management, delivery of goods and demands related to the adaptation to climate changes are becoming ever more complex. All of this brings about the necessity for the development of smart solutions for the city of Zagreb, tailored to the city and its citizens' needs.

A rapid development of modern technologies, their use in everyday life and possibilities for the use of digital information have resulted in the idea of smart city development. Smart cities strive to become cities tailored to citizens' needs which, aside from offering a pleasant place to live in, also enable efficient use of natural resources, sustainable economic growth, sup-

port research and development and provide high quality of life and availability of public services to all citizens.

Innovative urban planning and management, development of efficient solutions based on real data and information on city life along with the use of advanced, integrated, digital and communication technologies are leading Zagreb along the path to sustainable future.

Zagreb Smart City is a city open to diversity; its successful growth is influenced by all of its citizens. The realisation of the smart city vision entails care about safeguarding the available natural resources, continuous education, interaction and raising awareness, as well as innovation in all areas, which is possible only through the city authorities' active support of the smart city concept.

I believe in the city of Zagreb and its citizens. Through cooperation and working together, we will transform our city into a smart city, which will stand shoulder to shoulder to the most advanced European capital cities.

Join us on this journey!

Milan Bandić,
Mayor of the City of Zagreb

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ZAGREB SMART CITY

» High quality of life
» Competitive economy
» Development of innovative solutions
» Citizen involvement
» Advanced technologies

CONTENTS

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ZAGREB SMART CITY:
City tailored to citizens' needs

Smart cities are developed urban areas which facilitate the efficient use of natural resources and the existing city infrastructure, make sustainable economic growth possible, support the strengthening of research capacities, development and innovations, ensure high quality of life and provide all their inhabitants with access to public digital services.

Furthermore, all public services' functions, such as lighting, traffic or energy supply, are integrated in smart cities, resulting in increased efficiency, lower energy costs, faster communication between such subsystems and a significant decrease in greenhouse gas emissions.

This approach provides the opportunity for direct and continuous communication between citizens and city administration, city institutions and service providers along with constant raising of citizens' awareness concerning the city development and infrastructure planning processes.

A rapid development of modern technologies, innovative applications and their use in everyday life have generated the idea of a smart city, which is becoming a reality in the world's leading cities.

Development and use of innovative and technological innovations, as well as rapid development of information and communication technologies (ICT) present the biggest potential for the development of solutions and answers to the challenges of urban life in the future.

ZAGREB TODAY, ZAGREB 2030

Zagreb Smart City Framework Strategy

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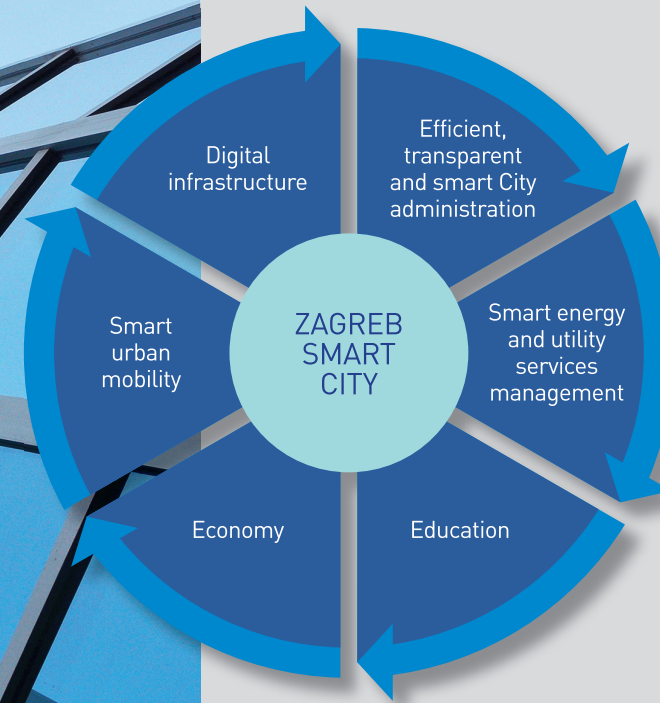
Zagreb Smart City Framework Strategy

>> Starting point for the transformation of the City of Zagreb into a smart city which provides the guidelines i.e. the framework for future development of the Zagreb Smart City in an open, flexible and clear enough manner for it to support specific at-the-field project solutions.

>> Defines the direction of all sectors' development, bringing it in direct connection with the advanced, integrated, digital and communication technologies.

>> Directs the City of Zagreb towards the implementation of innovative methods of resources and new technologies use, towards a better coordination of city administrative bodies and active involvement of citizens in the city development, in order to achieve optimal quality of life, develop economy and decrease greenhouse gas emissions, as well as adjust to climate changes.

>> Drafted by the Working Group for the Development and Implementation of the Zagreb Smart City Projects, which was set up in October 2016 by Conclusion of the Mayor of the City of Zagreb. The members of the Working Group are representatives of all relevant city administrative bodies, institutes, institutions and companies. External associates were also involved in the drafting of specific areas of the Framework Strategy.

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Digital infrastructure

Efficient, transparent and smart City administration

Smart urban mobility

ZAGREB SMART CITY

Smart energy and utility services management

Economy

Education

6 areas and 27 measures of the Smart City

Strategic areas and priority measures of the Zagreb Smart City Framework Strategy

The aim of the Zagreb Smart City Framework Strategy is to set goals for and determine strategic areas of the future development of the City of Zagreb as a smart city. Priority measures and activities for the achievement of the goals are defined for each strategic area.

Strategic areas of the Zagreb Smart City Framework Strategy

>> Digital infrastructure

>> Efficient, transparent and smart city administration

>> Smart energy and utility services management

>> Education

>> Economy

>> Sustainable urban mobility

Main goals of the Zagreb Smart City Framework Strategy

>> Increase the quality and standard of life

>> Strengthen the competitiveness of the economy based on knowledge and innovation

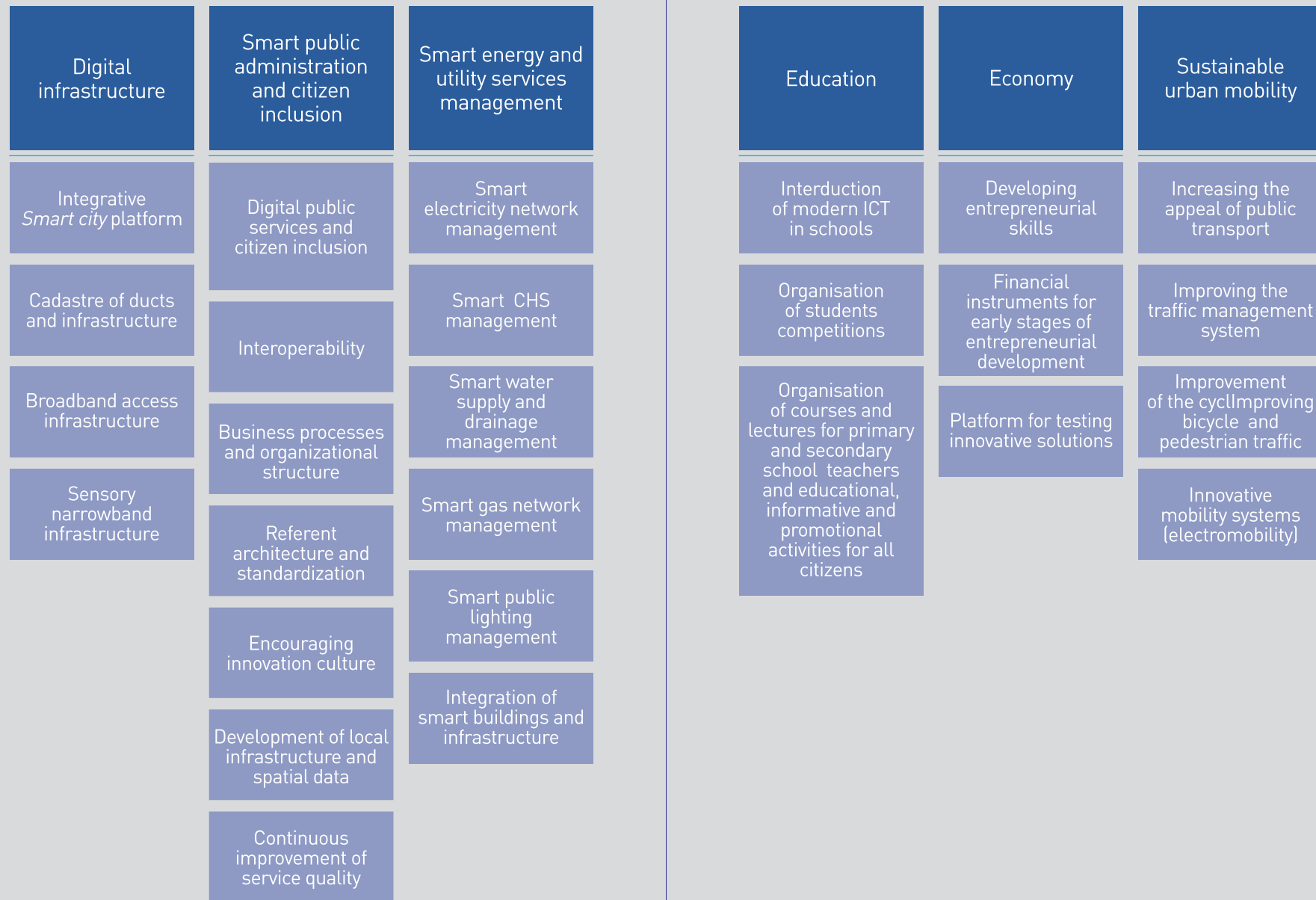>> Further develop and improve digital infrastructure availability

>> Use information and communication technologies' maximum potential in order to generate progress

>> Enhance sustainable use of natural resources and efficient adaptation to the effects of climate change.

Long-term results of the Zagreb Smart City Framework Strategy

>> *Quintuple Helix* model - interconnection and cooperation of all city systems and systems of the key stakeholders for development and provision of services (public administration, private sector, civil sector, academic community and citizens, as well as the environment and society as a whole) aimed at encouraging innovations, economic activity and long-term sustainability and environmental protection in the city of Zagreb area

>> Analysis of actual needs of the key stakeholders, especially citizens, through their active cooperation in the City's activities, aimed at improving the quality of life and the stakeholders' satisfaction

>> Collection and analysis of data related to City services, activities in the city relating to basic sectors defined by the Zagreb Smart City Framework Strategy (quality of life, economy, management and informing, environmental protection, combating climate change) and action based on the collected data which is to be proactive and reactive.

Strategic areas and priority measures of the Zagreb Smart City Framework Strategy

Digital infrastructure	Smart public administration and citizen inclusion	Smart energy and utility services management
Integrative *Smart city* platform	Digital public services and citizen inclusion	Smart electricity network management
Cadastre of ducts and infrastructure	Interoperability	Smart CHS management
Broadband access infrastructure	Business processes and organizational structure	Smart water supply and drainage management
Sensory narrowband infrastructure	Referent architecture and standardization	Smart gas network management
	Encouraging innovation culture	Smart public lighting management
	Development of local infrastructure and spatial data	Integration of smart buildings and infrastructure
	Continuous improvement of service quality	

Education	Economy	Sustainable urban mobility
Interduction of modern ICT in schools	Developing entrepreneurial skills	Increasing the appeal of public transport
Organisation of students competitions	Financial instruments for early stages of entrepreneurial development	Improving the traffic management system
Organisation of courses and lectures for primary and secondary school teachers and educational, informative and promotional activities for all citizens	Platform for testing innovative solutions	Improvement of the cyclImproving bicycle and pedestrian traffic
		Innovative mobility systems (electromobility)

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Digital infrastructure

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›› In order for the smart city concept to be realised, a strong, highly accessible and future-proof digital infrastructure is an essential prerequisite, since it is the foundation of every advanced smart service of today and of the future. The early, concept planning phase requires taking the future, as well as all the aspects of the operating of a city in the 21st century, into consideration.

›› The specific goal within this area is the development and upgrade of the existing digital infrastructure, i.e. the electronic communication infrastructure in the City of Zagreb area, with a special stress on the interoperability of various systems.

›› The City of Zagreb has been continuously investing in expanding the capacities of access points for wireless broadband Internet with the purpose of making free wireless broadband Internet widely accessible.

Main goals of the area

» Continuous increase in availability of the advanced broadband infrastructure for all users (citizens, entrepreneurs, institutions etc.) in the city of Zagreb area

» Continuous increase in the quality of utilities infrastructure management, accompanied by integration and synergy between smart electricity, lighting, heat, gas, water and other systems.

Priority measures of the area

» Integrative Smart City platform of the City of Zagreb

- The integrative Smart City platform of the City of Zagreb will enable the collection, processing, storing and sharing of every relevant sector's data among the involved smart city stakeholders.

» Duct and infrastructure cadastre

- A multidimensional infrastructure cadastre which includes 360 degree centimetre-precision images of under- and above-ground infrastructure, interpretations and determination of property title over individual segments of the infrastructure, information updating process etc.

» Broadband access infrastructure

- This measure is aimed at encouraging rapid implementation of advanced landline (FTTH, G.Fast, DOCSIS 3.1) and wireless (5G) broadband technologies, especially via ultra-fast fibre-optic access networks, for the purpose of quick provision of the infrastructural prerequisites for the realisation of the European Gigabit Society and a robust, future-proof Zagreb Smart City platform.

» Sensorial narrowband infrastructure

- the foundation for sensorial infrastructure and applications that require long-lasting energy sources and transmit small amounts of information, such as traffic and parking sensors, air and water quality sensors, structural and seismic sensors etc.
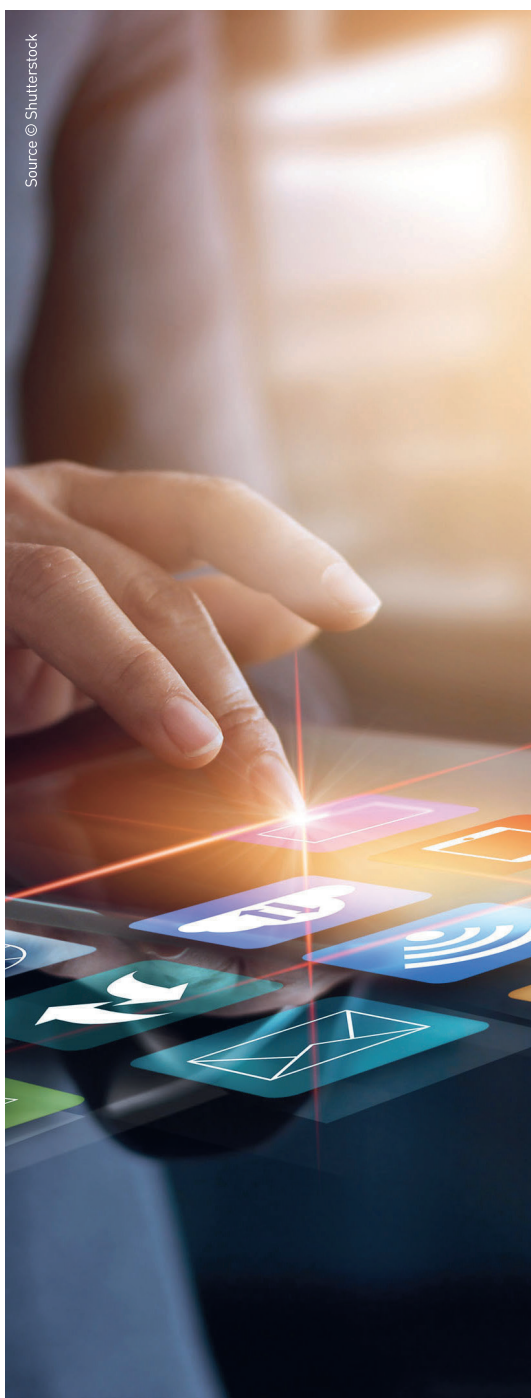
Smart cities require smart, efficient and transparent city administration, which intensely uses advanced information and communication technologies and encourages maximal involvement of citizens in the decision-making on important city matters and individual city district issues, as well as provides all relevant information for the decision-making process via various media and information channels.

Smart city administration provides its services to the citizens primarily online.

This makes the processes simpler and quicker and, as importantly, saves both time and money. Smart services in this area are simple to use, easy to find, safe and certified owing to the unified and standardised concepts. Information exchange between various city bodies is another vital feature.

In the process of smart city creation, it is necessary to set up new administrative structures and methods of cooperation/ communication between various city offices, institutions and companies, as well as towards citizens.
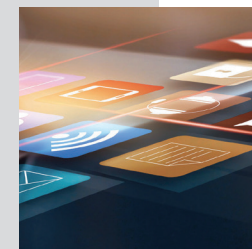
Efficient, transparent and smart city administration

The challenges and preconditions for achieving the goals of this strategic area are the following

>> Inadequate possibility of adjustment of the existing organisational structure

>> Lack of transparency, standardisation and efficient communication

>> Efficient coordination of strategic and operative goals with business processes

>> Improvement of the planning system and city administration efficiency monitoring system

>> Raising the level of transparency and purposeful communication towards all stakeholders

>> Continuous education of employees

>> Providing the required investments aimed at development and implementation of smart utilities and applications

>> Encouraging active involvement, especially in the decision-making processes on all levels, of key stakeholders: a large number of citizens, private companies and entrepreneurs, as well as all city administration employees

>> Improving the users' level of digital literacy

>> Providing timely access to fact-based information to the highest administrative structures for the purpose of improving decision-making process efficiency.

Priority measures of the area

>> Expediting the development of digital public services, increasing the digital technology competencies and the involvement of citizens

>> Managing the interoperability of the City's electronic services, in accordance with the development of interoperability on the level of the Republic of Croatia and the EU

>> Analysing and elaborating operational processes and establishing a suitable organisational structure with the purpose of integral management of the implementation and coordination of processes and activities

>> Generating reference architecture and standardising the technological platform

>> Encouraging the innovation culture among the city administration employees and citizens via broader involvement in the processes of new digital public services creation

>> Development of a local infrastructure for spatial data – ZIPP

>> Continuous improvement of the city service quality and research into further improvements in accordance with the international ISO standards.

Smart energy and utility services management

In order to achieve the ambitious energy efficiency goals and levels of renewable energy use in the Republic of Croatia, as well as in the whole of the EU, exceptionally large financial investments will be necessary, as well as smart solutions for better interaction between energy efficiency measures and installation of renewable energy sources.

The City of Zagreb has adopted strategic and implementation documents for energy efficiency and use of renewable energy sources area, which anticipate implementation of an array of measures and projects.

In the part relating to the strategic area of smart energy management, the Zagreb Smart City Framework Strategy anticipates activities aimed at establishing a smart energy system.

A smart energy system integrates all networks into a single entity with the help of ICT, and coordinates their work in order to accomplish optimal solutions for individual sectors and users, as well as for the system as a whole.

18.3 °C

Main area challenges

» A very large number of the key stakeholders which must be included (companies dealing with the supply and distribution of energy)

» Integrated approach to energy management and planning

» Creation of a framework which would enable the City of Zagreb to have maximum influence on the matter of integrated energy planning
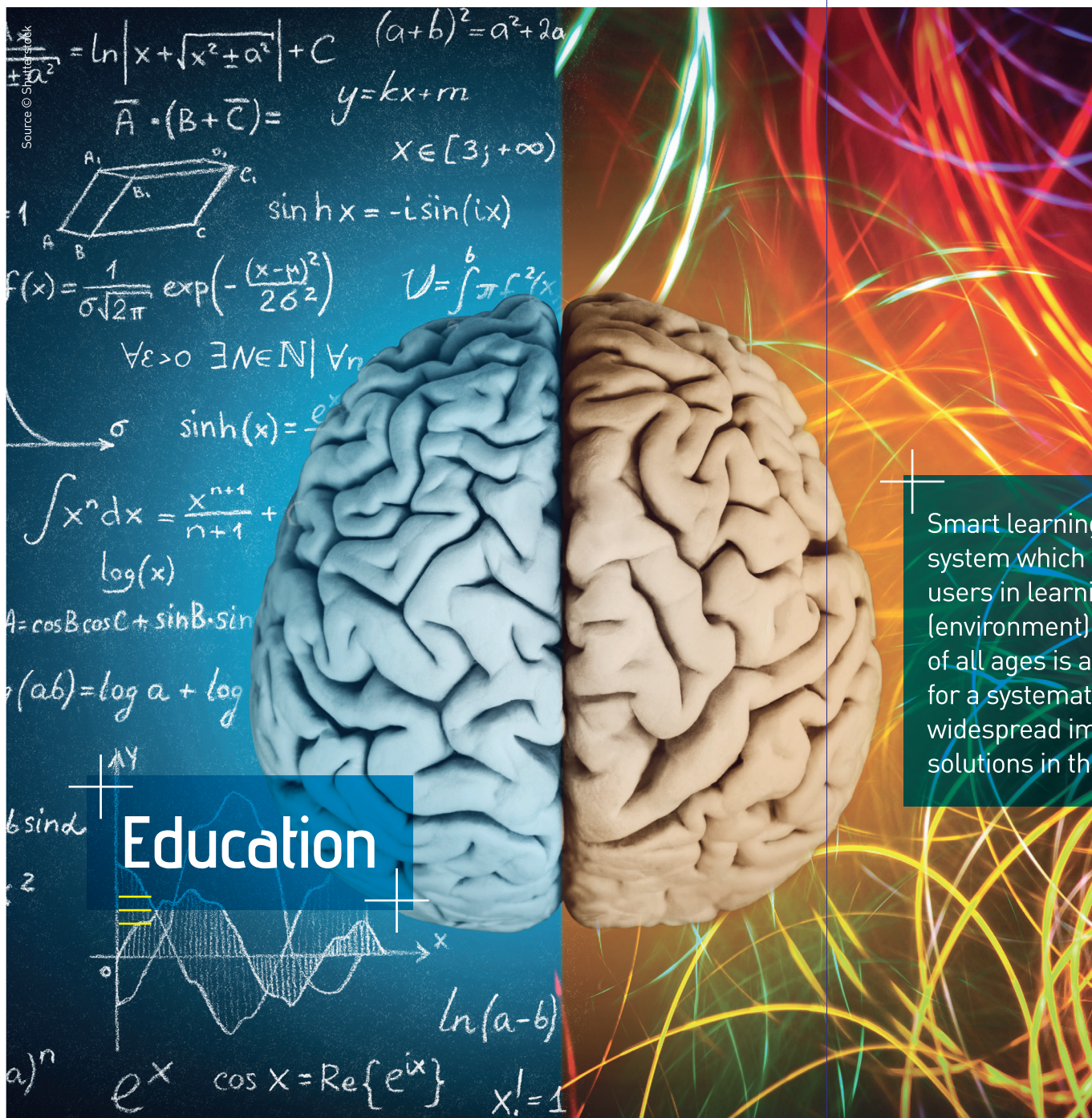
Priority measures of the area

» Smart electricity networks

• installation of smart meters and control devices is possible on the high, middle and low voltage levels, with the implementation of activities mostly falling under the authority of companies within the HEP Group.

» Smart lighting

• Networked smart lighting system, which supports two-way communication and cloud computing control, in addition to the possibility of digital monitoring of the service life of the lighting system, including maintenance. The lighting system should be integrated with the other elements of the ICT infrastructure and with smart city sensors and field signalisation.

» Smart heat energy networks

• Networked smart systems for heating and cooling for all categories of consumers; HEP-Toplinarstvo d.o.o. is the company largely responsible for the implementation of heat activities.

» Smart gas networks

• Networked system for gas distribution and supply for all categories of end-users; Gradska plinara Zagreb d.o.o. is the company largely responsible for the implementation of gas activities.

» Smart water supply and drainage

• Water network and system for drainage of waste- and precipitation water.

» Integration of smart buildings and infrastructure

• interaction between the buildings of consumers (prosumers) and networks, aimed at stronger integration of renewable energy sources, as well as economically optimal building and infrastructure management.
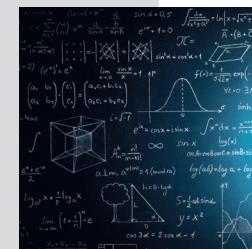
Education

The key element and the essential precondition for the achievement of smart city goals and concept is maximum inclusion of citizens – informed, educated and capable of using all opportunities and benefits offered by smart technologies and solutions.

Education – formal, through the school system and lifelong learning creates the conditions for active inclusion of citizens, but also enables the development of innovation and creativity, necessary in order for the city, i.e. society to be generally characterised as smart.

Smart learning is a learning system which advises and guides users in learning in real world (environment). Educating citizens of all ages is absolutely necessary for a systematic development, i.e. a widespread implementation of smart solutions in the city of Zagreb area.
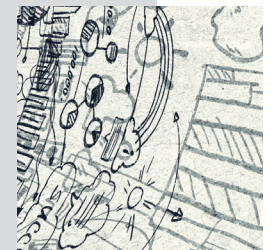
Main goals of the area

>> Use of contemporary IC technologies and smart solutions in the overall learning process

>> Encouragement of innovation and creativity among primary and secondary school students in the area of development and use of smart solutions and tools, resulting in the development of problem solution skills, personal initiative and teamwork, i.e. cooperation

>> Strengthening of cooperation between educational institutions, economy sector and industry in the area of development of smart solutions and IC technologies through the development of educational programmes

>> Maximum involvement of citizens as final users of all smart solutions and services, via education on contemporary IC technologies and smart solutions, along with informing and promotion of the implemented and planned smart solutions in the area of the city of Zagreb.

Priority measures of the area

>> Introduction of contemporary IC technologies, smart devices and solutions into all primary and secondary schools in the area of the City of Zagreb

>> Organisation of regular competitions in development and application of smart solutions and tools for primary and secondary school students in the city of Zagreb area

>> Organisation of regular courses and lectures for primary and secondary school teachers and of educational, informative and promotional activities (panels, seminars, workshops etc.) for all citizens of the City of Zagreb.

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Economy

Cities are the key drivers of social and economic development of every country and society. Dynamic, efficient and innovative cities have a strong impact on the development of national economy and consequently on better quality of living and general welfare.

Economic development of smart cities is based on the creation of a complete and comprehensive environment which enables and encourages innovation and creation of new business models.

The City of Zagreb has a significant potential which would bring about a stronger development of economic activity based on knowledge and contemporary business models.

The strategic goal of this area is the creation of a basis for the development of innovative business models, which would enable companies to adapt to a new, more innovative and competent access to the market. This process includes digitalisation and an improved integration of new models of services, adapted to changes in clients' requirements. Such programmes bring about a strong development of economic activities in the priority areas.

Main goals of the area

» Continual development of entrepreneurial skills and entrepreneurial initiative

» Enabling innovative start-ups to access funds for the financing of the early development phase (seed equity) and other forms of alternative sources of financing

» Networking, promotion and, via a financially sustainable business model, offering the available public and private technological, laboratory and research equipment to the market

» Encouraging the development of smart solutions via the creation of a digital platform which would enable the interested parties to access information necessary for adaptation of their strategies and give them the possibility to test innovative solutions

» Strengthening of the social innovations sector

» Strengthening of creative and cultural industries (CCIs) sector

Priority measures of the area

» Raising the level of entrepreneurial competences

» Use of financial instruments and alternative sources of financing for early stages of entrepreneurship

» Creation of a city platform for testing innovative solutions (Living Lab) and strengthening of creative innovative spaces (maker spaces).

Desired effects:

» Significantly increased cooperation between scientific research institutions and innovative companies

» Commercialisation of innovations and smart applications and solutions

» Significantly increased inclusion of citizens into the creation and use of smart applications and solutions

» increased number of innovative companies

Smart mobility system calls for the availability of infrastructure, including physical, communication and information infrastructure, IoT platform, application level, whose coordination and integration is of crucial importance.

This framework strategy proposes short-, medium- and long-term measures, i.e. projects whose implementation will help solve problems of increased mobility. Projects aimed at increasing the attractiveness of public city passenger transport as the primary basis of city of Zagreb mobility system have been defined.

The growing trend of urbanisation leads to the increase of urban population, thereby increasing traffic system challenges in cities. Efficient mobility is one of the main challenges faced by cities in the sense of increased demands, very often in the context of existing (inadequate) infrastructure, with citizens' awareness of newly available, more ecological technologies, increasing.

Sustainable urban mobility

Main goals of the area

›› Main goals need to be analysed through main groups of participants affected by planning and functioning of urban mobility

›› Passengers – improvement of passenger experience, increased safety and more precise calculation of journey duration and cost, for both physical persons and business users

›› Transport operators – balancing of supply and demand as a guarantee for functionality improvement, possibility of more efficient use of transport resources, promotion of alternative means of transport and provision of environmentally sustainable transport

›› Urban planners – improvement of urban planning procedures based on real and modelled data on passenger requirements and their behavioural patterns

›› City authorities – generation of economic growth through the development of an economy sector based on technology, data and information

›› Adopt/draft a plan of joint decision-making, harmonisation and adoption of plans comprising all competent organisations (road traffic – cars, trams, buses, trains, bicycle traffic, pedestrians etc.)

Priority measures of the area

›› Increased attractiveness of public passenger transport in the urban agglomeration

›› Improvement and development of the traffic management system

›› Improvement of bicycle and pedestrian traffic

›› Use of innovative operative systems (primarily electromobility systems)

Desired effects

›› Reduced consumption of fuel and electricity

›› Reduction of traffic congestion and traffic jams

›› Increased security

›› Simpler, better, more efficient and economically optimal system

›› Reduction of requirements for the building of additional traffic infrastructure in urban centres

›› Adopt/make a traffic map of the city of Zagreb

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VISION OF THE CITY IN 2030:
Benefits of transformation into Smart City

The vision of the City of Zagreb 2030 is that of a European metropolis, which can measure up to the grandest cities in Europe. Digitalisation of overall business and citizen cooperation will ensure an enviable level of quality of life and numerous savings, as well as entirely new business and economic growth models which ensure a high standard of living for the citizens. By implementing this Framework Strategy's measures and activities, the City of Zagreb will gain the reputation of a regional digital innovation centre with:

» Highly educated staff;

» Positive investment climate and organised infrastructure;

» Enviable business culture;

» Development platforms which provide room for innovations and progress;

» High availability of open data and powerful mechanisms for the security and protection of such data.

Every citizen and economic operator will receive their own digital identity which will be completely integrated with the European service provision system, that is, with the e-Citizens system, meaning that everyone staying or living in Zagreb, whether a business user or a tourist, will remain on their digital home turf.

One of the basic smart city attributes is citizen involvement and participation at all decision-making levels (from strategic big picture decisions to the day-to-day ones). For citizens to be actively involved, data from all important areas of life in the city of Zagreb (transport, healthcare, infrastructure, economy etc.) should be widely available, logically organised, easily searched, open and transparent. This precondition also enables and encourages development of smart applications (primarily smartphone apps) by companies and entrepreneurs.

The transformation into the smart City of Zagreb will affect technological innovations, smart transport, energy efficiency, i.e. reduction in resource consumption, citizens' and workers' lives and companies via numerous changes related to, e.g. teleworking, e-democracy and increased transparency, in addition to enabling stronger involvement in decision-making processes.

Zagreb, 2019