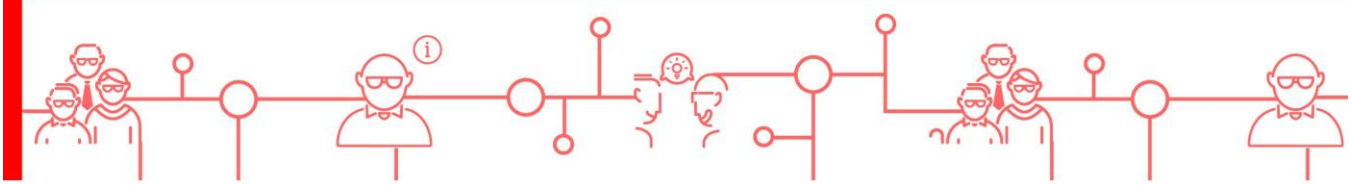
SMART_KOM STRATEGY

Roadmap for smart solutions in
Kraków Metropolitan Area



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Roadmap for smart solutions in Kraków Metropolitan Area

KRAKOWSKI PARK TECHNOLOGICZNY

Małopolska

KRAKÓW

TU WIEN

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INTRODUCTION

Dear Sir/Madam,
The SMART_KOM strategy provides a specific roadmap which sets guidelines for developing a smart city. The provisions of the strategy are the beginning of the process of changes. They are also a suggestion of innovative solutions, as well as other solutions which were verified and tested in various urban areas in Poland and around the world. Their implementation will be extended in time.

The SMART_KOM strategy is a property of all users of the city. What is important, the list of projects included in the strategy is not a complete list of ideas. It is open for any new initiatives which are consistent with the Smart City development mission and compliant with the Adaptive City concept.

We are confident that SMART_KOM strategy will be a real tool for supporting the development of Smart City, addressing the needs of its citizens, as well as the development of other KOM communes.

I would like to thank all individuals involved in this project - moderators, experts and all those who contributed to formation of the "Roadmap". This document could not be created without their professionalism, interesting ideas and willingness to share their own experiences. We would like to thank especially Polish and foreign Project Partners: Malopolska Region, City of Kraków, as well as Vienna University of Technology and Forum Virium Helsinki. Thank you, and we are still waiting for your ideas, comments and recommendations !

Wiesława Kornaś-Kita
Chairman of the Board of Kraków Technology Park

Dear Sir/Madam,
We hereby present you the Roadmap of Smart Solutions for Kraków Metropolitan Area. This is a document on the basis of which Kraków and KOM can plan their smart development. It is also a source of inspiration for smart development of other cities and regions. We invited experts from universities, companies, non-governmental organizations and administration in Malopolska, as well as European specialists in the field of Smart City, to work on the document. This cooperation is a great value of the project "SMART_KOM. Kraków in Smart Cities Network".

I am satisfied that the element of public debate, present in our regional activity, was consolidated thanks to the project. I believe that taking actions in line with the recommendations included in the presented document will transform Malopolska into a really smart region - environment-friendly, ensuring high quality of living for its inhabitants, attractive for investors and smartly administered. Smart City and Smart Region are the future. For Malopolska, the future has already begun.

I hope you will find the publication interesting
Marek Sowa
Marshall of the Malopolska Region

Dear Sir/Madam,
Thanks to the creativity of its inhabitants and strong position as a scientific centre, Kraków constantly implements Smart City solutions and ideas. The result of the nearly completed SMART_KOM project is the development of a strategy - a specific roadmap for such solutions in Kraków and Kraków Metropolitan Area.

Smart city should be open to its inhabitants, encourage their activity, make use of their creativity, and this is precisely the role of a territorial self-government. We must remember that we cannot be focused only on the implementation of new technologies. We also have to take care of proper education, so that the applied innovative solutions had their recipients. Acting together and combining the best ideas and features is the only way to create a city of the future, providing its inhabitants with space for free development.

Prof. Jacek Majchrowski
President of Kraków

The understanding of "smart city" presented in the "Roadmap for smart solutions in Kraków Metropolitan Area" is close to the so-called wide approach towards defining the problems of smart cities (smart institutions and procedures), while maintaining the basic assumptions characteristic for the so-called narrow (technological) approach. Therefore, the idea of smart city for Kraków and KOM is regarded in many aspects, mostly as a set of innovations improving the quality of living for citizens, as well as system innovations to improve the functioning of the city and Kraków Metropolitan Area. Such attitude is characterised by diversity and multidimensional offer, as well as holistic approach to the development of urban fabric. For Kraków and KOM, "smart is definitely more than technologies" - this statement leads to regard the frames of information and communications technologies (ICT) as useful tools (never goals) for implementing the vision of development of Kraków and KOM within the Smart City concept.

"Roadmap for smart solutions in Kraków Metropolitan Area" is a developed set of strategic general and detailed recommendations for four areas of development for Kraków and KOM in accordance with the Smart City concept.

In the mobility and environment in KOM area, it is especially recommended to improve the quality of air in Kraków, carry out integrated transport policy in Kraków Metropolitan Area (Kraków + nearby communes), as well as develop sustainable transport, i.e. undertake activities towards constant increase of the share of collective transport, individual bicycle and pedestrian transport (eco-transport) in the general transport structure in the territory of KOM.

In the field of participation and quality of public space, the main recommendations are related to the necessity of forming and supporting cross-sectoral cooperation NBSM (referring to Science-Business-Residents-Local Government). The cooperation concerns development of the city, universal application of deliberative participation principles and identification of potential of the existing public spaces. It is important to provide these activities with real benefits which can be fully used by the local communities, as well as to develop local centres, so that each inhabitant of KOM was able to fulfil most of his/her public needs within the distance of 3-4 kilometres (polycentric city).

Recommendations in the "Active, healthy and safe inhabitants in KOM" area concern mainly the development of conditions for extending the activity of senior citizens, integration and promotion of activities intended for improving health and physical condition of inhabitants, as well as for improving the sense of security in public space and on the Internet.

Moreover, it is recommended to change the attitude to information management policy in public institutions by opening data (Open Data), as well as to change the attitude to provision of services by public institutions. It is essential to establish a communication platform between the citizens and the city, develop electronic services oriented towards the user based on the living lab formula, introduce Kraków Metropolitan Area Resident IDs, etc.

The starting point for every good strategy is a reliable diagnosis of problems and needs. The performed qualitative and quantitative analysis was reflected by the list of several challenges which shall bring Kraków and KOM closer to the Smart City paradigm. The challenges are: proper organisation of multimode transport, efficient struggle against environment pollution, balanced and polycentric development of the city, need for implementation of complex revitalization projects, appropriate development of public spaces and green areas, taking care of providing new offer for persons with impairments and senior citizens, as well as silver economy sector in connection with demographic processes. The key challenges also include successful inclusion of all sectors in the process of solving problems reported by the citizens. In the context of economy, the key significance lies in innovations and development of Kraków R&D sector. It is

crucially important to find the right management model for Smart City processes, include the users in designing e-solutions for public services and monitor the quality of public services on an ongoing basis. It is equally significant to provide access to data owned by different sectors, at the same time ensuring the security of personal and sensitive data. Another challenge is to develop appropriate procedures for managing large projects, which have a major influence on the development of Kraków and KOM. The European benchmarking study, performed within the framework of a research project European Smart Cities, provided highly interesting analytic knowledge concerning the condition of Kraków and the paradigms of its increase in Smart City areas. The study analysed the position of Kraków in six Smart City areas: people, living, economy, environment, mobility and governance. In comparison with 90 examined European cities, Kraków has the most favourable results in the "living" areas, whereas the results in "environment" and "economy" were relatively low.

In the horizontal level, the most optimum development model for the implementation of smart city concept in Kraków and KOM is the adaptive and interactive model. By definition, adaptive city is an urban area with urban infrastructure, the development of which is initiated and guided by decisions of its citizens and implemented by different groups of stakeholders: administration, public services, municipal service providers, private investors, citizen groups. Adaptive city may function effectively only thanks to the support of integrated information technology systems (ICT), providing access and processing data in real time. The conditions for city adaptiveness are as follows:

- functioning of general city ICT systems, capable of gathering, providing access and processing information,
- open universal access to information about the city,
- multilateral (interactive) communication between citizens and administration, public services, municipal service providers, entrepreneurs, citizen groups,
- implemented procedures for participatory planning methods and self-improvement of infrastructure and municipal services,
- general presence of IT-supported services (ITeS).

IT technology of adaptive city allows to manage its development towards improvement of the quality of living of citizens, in line with the natural city self-organisation processes. Such understood area functions within the cycle beginning with information obtained from an individual citizen and ending with self-improvement of municipal systems and plans. This cycle can be illustrated by means of the so-called five-node pentagon loop model applied in the SMART_KOM strategy, which was described in detail in the chapter entitled "Strategy and Recommendations".

The "Roadmap" is supplemented with a set of 24 smart project index cards, developed by SMART_KOM experts in accordance with precisely formulated criteria of quality and efficiency. The projects presented in this document do not constitute a closed list, but a proposal for particular projects, which are intended for the development of Kraków and KOM in line with the Smart City paradigm. The projects described on the index cards should be carried out by different parties involved in the SMART_KOM project, using the available (and indicated in the description) sources of financing: POIR (Operational Programme Smart Development), MRPO (Malopolska Regional Operational Programme, in particular the ZIT - Integrated Territorial Investments - tool), Horizon 2020 and others.

CONTEXT

Planning sustainable and smart development of a city is becoming a serious challenge in the period of current social and economic changes. The migration flows and related suburbanisation mean that the previous concept of city as a unit determined by its administrative borders is becoming less important. The current practice enforces city authorities to recognise functional links between a large metropolis and its surrounding smaller units for the purpose of undertaking partnership initiatives, as well as joint efforts intended for increasing the comfort and quality of living of citizens in the entire area. The fact that an increasing number of people work, study, or meet and fulfil their consumption, social or cultural needs outside their place of residence means that such areas should be regarded in a new, integrated way. The response to such phenomena is effective management, addressing the needs of citizens, using modern technologies and tools in order to improve the quality of living across the entire area where functional links appear. Such links are present in the Kraków Metropolitan Area.

Sustainable management of the city structure, with the application of the existing resources and necessity of cost optimisation at the same time, requires proper and reasonable approach. The Smart City concept is becoming one of the major challenges in the discussions of representatives of territorial self-governments. The decision-makers wonder whether and in which Smart City areas they should invest in the first place, in order to ensure the comfort of living for citizens, as well as good conditions for development of business, therefore gaining competitive advantage. The discussion in this field is increasingly joined by representatives of municipal organisations, non-governmental organisations, as well as business and scientific environments.

Therefore, the question arises, what is Smart City, which is the object of aspirations for a majority of cities around the world ? As usually in such cases, there is no single, universal or widely adopted definition of smart city. Both R&D units and particular entities providing "smart" solutions understand this notion in their own ways. However, there is a common element in all approaches, which says that Smart City cannot be identified only with modern technological solutions. Smart City shall be regarded in a much wider context, and such solutions are in the hands of authorities, citizens or ICT specialists and are intended mainly to improve the quality of living of citizens. The key issue in the functioning of Smart Cities is the fact that investment in smart development of a city translates to real savings and opportunity to reinvest the saved amounts. These aspirations can be fulfilled due to a new financial perspective, providing huge resources for territorial self-government units, including also solutions which are in line with the Smart City concept. Thanks to EU funding, Polish territorial self-governments may invest in a wide range of solutions, such as smart water meters, traffic management and municipal transport system, or city monitoring system.

Another tool for implementing such solutions and smart development of the city are planning and development documents. The strategy has gradually become a specific "mantra", also in the activities of public administration. It is impossible to calculate precisely the number of strategies which were developed in the public sector in recent years. There are many reasons for this situation. It is partly caused by real care for proper planning and development of territorial self-governments, and partly a direct result of legislative requirements, frequently deprived of deeper reflection on the use of strategic concepts in development policies. In many cases, having strategy has become a necessary condition of access to EU funds. Therefore, strategic planning and management in many environments has lost its previous value. Meeting obligatory requirements of external grant competitions frequently had an impact on a change of development directions of communes.

Being aware of the previous practice, we have developed the presented document in a slightly different form. First of all, it was created with a focus on the real needs of KOM citizens. It is not only a set of recommendations and solutions to be implemented. It is also not a typical strategy focusing on setting general or sector-based strategic goals. This is a "roadmap", indicating directions for the development of Adaptive City, i.e. city which is open to various effective models of response to changes and new approach to problem solution, as well as providing public services in order to ensure the highest quality of living for citizens at the lowest possible cost.

We are confident that the Adaptive City concept, as well as presented recommendations and projects, will become a helpful tool for implementing smart solutions, which will, first of all, have a positive impact on the improvement of quality of living of KOM citizens and contribute to sustainable development of Kraków agglomeration.

Project **"SMART_KOM. Kraków in smart cities network"** is a joint initiative of Kraków Technology Park, Malopolska Region, Kraków City Hall and two foreign partners representing leading institutions in the field of Smart City, i.e. Forum Virium from Helsinki and Vienna University of Technology.

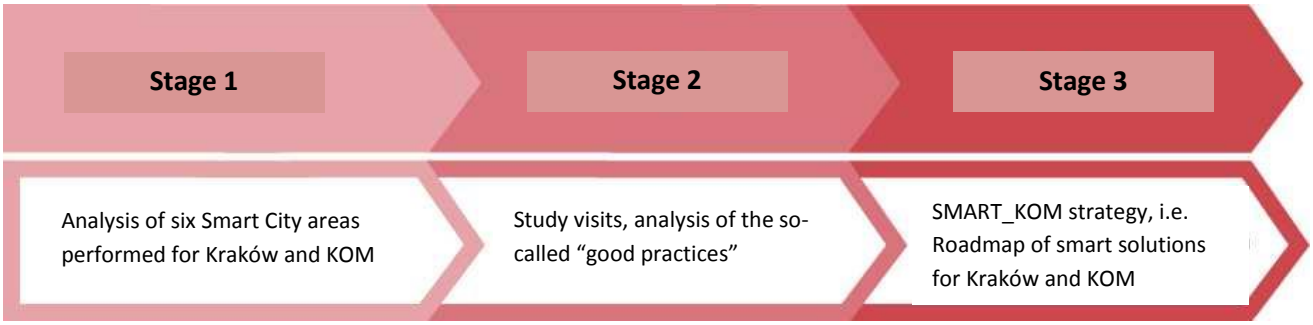
SMART_KOM PROJECT

The goal of the project was to prepare a Smart City strategy for Kraków and Kraków Metropolitan Area, using international experiences in this field. The project was supplemented by development and implementation of two pilot projects: Apps4Krk portal and the so-called micro park. SMART_KOM project was executed from September 2013 to June 2015 and co-financed from the funds of European Regional Development Fund and state budget within the framework of Malopolska Regional Operational Programme for 2007-2013.

In SMART_KOM strategy, we use the notion of KOM - Kraków Metropolitan Area, whose territorial scope includes the city of Kraków with 14 nearby communes: Biskupice, Czernichów, Igołomia-Wawrzeńczyce, Kocmyrzów-Luborzyca, Liszki, Michałowice, Mogilany, Niepołomice, Skawina, Świątniki Górne, Wieliczka, Wielka Wieś, Zabierzów and Zielonki.

This area is convergent with the territorial scope of Stowarzyszenie Metropolia Krakowska (Kraków Metroplis Association), which was established for the purpose of using a supporting instrument referred to as Integrated Territorial Investments (ZIT). In the further part of the study, whenever the city is referred to, we mean the city of Kraków together with its entire metropolitan area covered by ZIT.

The complete process of works on the SMART_KOM project consisted of 3 stages.



I PROJECT STAGE

The first stage of the project included diagnostic workshops conducted for 6 Smart City areas: Smart People, Smart Living, Smart Governance, Smart Economy, Smart Environment and Smart Mobility. Each workshop was dedicated to an analysis of the region potential, including SWOT analysis and analysis of stakeholders, according to the adopted methodology. The workshops were attended by employees of the City Hall and various municipal units, external experts representing scientific environments, business and non-governmental organizations. The result of this stage was also determination of the directions of study visits. The workshops were attended by over 160 people representing different sectors.

II PROJECT STAGE

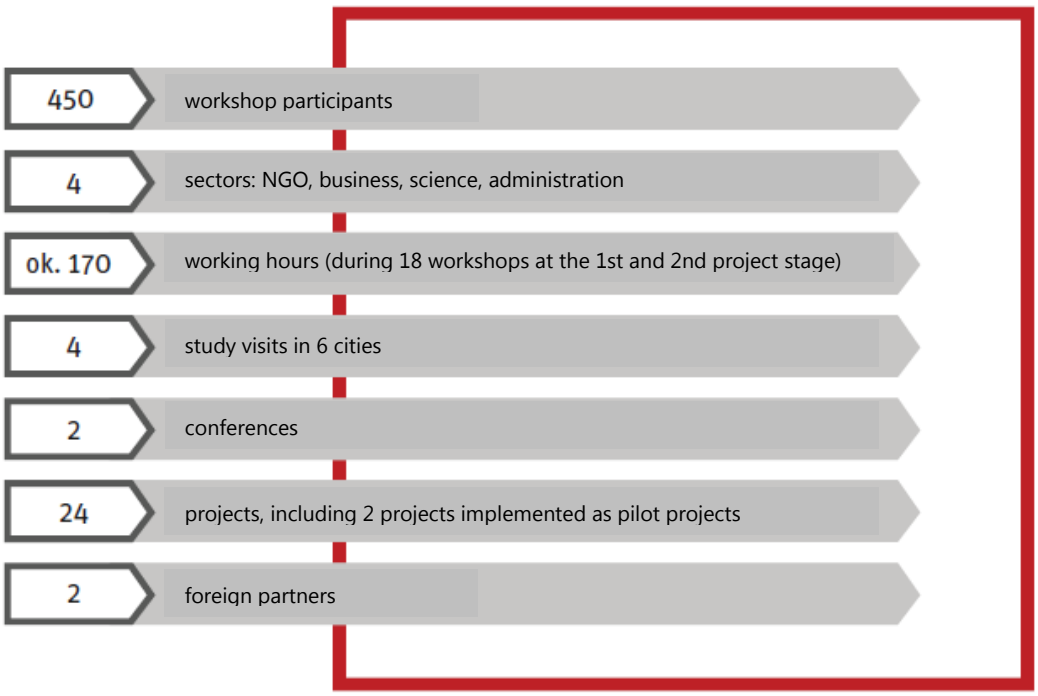
The second stage of the project was dedicated to identification of good practices in the fields of the largest potential efficiency, defined during the workshops at the first stage. This stage was started with study visits in the cities which are currently leaders in implementing Smart City solutions in Europe, i.e. Vienna, Helsinki, Barcelona, Saragossa, Tallinn and Tartu. Each study visit was followed by an interim report, presenting good practices in the field of smart city implemented in these cities, in particular areas of their functioning. The reports also included necessary recommendations to be taken into consideration when developing solutions in similar areas in Kraków and KOM. This part of the project finished with a conference summarising the first two project stages, which were overall attended by approximately 180 people.

III PROJECT STAGE

The third stage of the project consisted of 10 workshops with the participation of domestic and foreign experts. The main goal of this stage was the development of SMART_KOM strategy, covering the Smart City mission, the concept of Adaptive City, recommendations for public policies and catalogue of 24 project proposals, including 2 pilot projects prepared for implementation, i.e. Apps4Krk project and Micropark project. The workshops were attended by over 200 people from 4 sectors: administration, science, non-governmental organisations and business, as well as all project partners, including prof. Rudolf Giffinger from the Vienna University of Technology and Jarmo Eskelinen from Forum Virium Helsinki.

HOW WE WORKED

As a result, during two and a half year period of implementation of SMART_KOM project, we managed to gather more than 450 experts representing 4 sectors involved in development of the city, which overall amounted to over 170 hours of workshop work within the framework of the project. Additionally, 4 study visits in 6 European cities allowed to identify good practices in the field of implementing smart solutions in particular areas of the functioning of the city. Also, two foreign partners - experts in the field of Smart Cities - were invited to cooperate in the project. Both the first stage and the entire process finished with summarising conferences. Thanks to all these elements, involved people and creative work during the workshops, it was possible to develop the "Roadmap" for Kraków and KOM, with an open bank of 24 projects ready for implementation, including 2 projects already implemented as pilot projects.



SMART_KOM STRATEGY DEVELOPMENT PROCESS

The basis for works on the development of SMART_KOM strategy, i.e. roadmap for smart solutions in Kraków and KOM were the results of the diagnostic stage of the project. Its result is the development of a collective report - a specific diagnosis containing conclusions and recommendations for further actions. The final, third stage of the project was fully dedicated to working on strategic and operational assumptions and resulting projects in the field of smart solutions, which may be implemented in Kraków and KOM. The workshop works began by formulating development mission based on the Ashridge model, i.e., defining key issues which determine activities related to preparation of Kraków and KOM for becoming a Smart City and metropolis. Additionally, during the process of developing the strategy, other issues appeared, which had an impact on the final wording and constituted its integral part, i.e.:

- development of the concept of Adaptive City;
- performing division into thematic areas of the functioning of the city and resulting recommendations;
- development of a catalogue of solutions related to Smart City.

Representatives of different sectors participated in the project, which, taking advantage of the effect of synergies, provided the possibility of multidimensional attitude towards strategic decisions and development of the above issues using knowledge and experiences of experts involved in the project.

SMART_KOM STRATEGY ARCHITECTURE

The entire document is divided into three parts. The basic assumption during development of the "Roadmap" for Kraków and KOM was taking into consideration the results of the diagnostic stage of the project and conclusions of the completed study visits. The diagnostic part of this document includes the results of problem diagnosis and conclusions of the research on positioning of Kraków against other European cities. The second part, "Strategy and Recommendations", presents the mission of developing a Smart City, description of the concept of Adaptive City and recommendations for public policies, formulated within 4 thematic areas. The "Projects" part presents criteria intended for development of a catalogue of projects concerning smart solutions, project charter and problem of allocating projects using the node principle within the concept of Adaptive City.

SMART_KOM strategy assumes the role of Roadmap for smart solutions in Kraków and KOM. The strategy structure consists of 4 elements functionally dependent on one another, i.e.:

- Smart City development mission;
- Adaptive City concept;
- recommendations for public policies;
- catalogue of open projects.

Each of them constitutes an integral part of the strategy document.

The entire structure of the document is closed with a chapter concerning challenges faced by Kraków and KOM in the field of implementing the strategy and issues related to its popularisation.

For the purpose of facilitating experience with the document, subsequent chapters were illustrated with infographics.

DIAGNOSIS

1. Results of the first stage of the project.
2. Benchmarking study.

+

STRATEGY AND RECOMMENDATIONS

1. Smart City development mission.
2. Adaptive City concept.
3. Recommendations for public policies.

+

PROJECTS AND SOLUTIONS

1. Criteria for developing projects and structure of project charter.
2. Connection between the projects and the Adaptive City concept.
3. Popularisation of the "Roadmap"

SMART_KOM STRATEGY AGAINST OTHER STRATEGIC DOCUMENTS

The key assumption of the project was to develop "Roadmap for smart solutions in Kraków Metropolitan Area" in a spirit of complementarity with strategic documents containing the current development perspective for 2011-2020. This refers to: Strategy for Integrated Territorial Investments for Kraków Functional Area (part of the Malopolska Regional Operational Programme for 2014-2020, Strategy of Development for Malopolska Region for 2011-2020, Regional Innovative Strategy for Malopolska Region, or Strategy of Development for Kraków 2030, already at the final update stage. The consistence and integrity of "Roadmap" both with the ZIT strategy (implementing strategic goals of KOM communes) and Strategy of Development for Kraków 2030 make it a tool for supporting the implementation of strategic goals for the capital of Malopolska and its nearest surroundings.

The diagnostic stage, intended to determine and recognise the current state of affairs and its development tendencies, is a specific foundation for undertaking any planning works. This approach was also adopted in the case of works on the project "SMART_KOM. Kraków in Smart Cities Network".

PROBLEM DIAGNOSIS

During the first stage of the project, a lot of attention was focused on the analysis of the condition of the city of Kraków, mainly with regard to the implementation of the Smart City concept. The diagnosis was developed with an attempt to use experiences from previous projects of this type and draw good practices from them. The main features taken into consideration while working on the diagnosis were: various perspectives and resulting subjective assessments of particular units involved in the project, as well as formal conditions for successful implementation of the project. Therefore, the first stage of the SMART_KOM project, consisting in the diagnosis, took the form of a series of workshops with participation of project partners and invited experts representing science, business, non-governmental organizations and public administration.

The diagnosis also includes the results of the benchmarking study performed by the Vienna University of Technology under the guidance of prof. Rudolf Giffinger - project partner. The purpose of the study was to establish the position of Kraków presented in six smart city areas[1] in comparison with large European cities. In the end, 90 cities from 21 countries, with the population between 300,000 and 1 million citizens, were analysed. The study was performed with using the original tool developed and applied by the team of prof. R. Giffinger The further part of the study presents main conclusions of the diagnostic stage of the project, as well as summary of results of examining the position of Kraków in comparison with other big cities in Europe.

RESULTS OF THE FIRST STAGE OF SMART_KOM PROJECT - DIAGNOSIS[2]

The currently conducted public discourse concerning the concept of Smart City has not developed one coherent concept. During diagnostic works, it was seen rather as an advantage and inspiration in search of solutions and practical applications in municipal and metropolitan units. For the purpose of the project, the adopted notion of Smart City referred to the application of new technological solutions (mainly ICT) for managing the city and providing public services for citizens and other units, and in a much more universal context, to institutions, procedures, and even citizens, focusing on the participative model of public management. In this approach, city is defined as a unit which enables and creates conditions for activities undertaken by the citizens.

In accordance with a universally recognised division of the concept of Smart City into 6 living areas, city can be labelled as 'smart' provided that its functioning is planned and it is managed in a manner which allows for implementation of particular priority aspects of the "smart" concept. Therefore, at the starting point of project "SMART_KOM. Kraków in Smart Cities Network", the following understanding of the basic areas of Smart City was assumed:

1 The six smart city areas taken into consideration are: Smart People, Smart Living, Smart Mobility, Smart Environment, Smart Governance and Smart Economy.
2 The full version of the report summarising the first stage of the project can be found under the following address: http://www.sse.krakow.pl/pl/smart-kom/analiza.html.

- **Smart People**
- **Smart Economy**
- **Smart Living**
- **Smart Mobility**
- **Smart Environment**
- **Smart Governance**

Based on the division into six intertwining areas of smart city, during the first stage of SMART_KOM project, in the period from November 2013 to March 2014, the total of 6 diagnostic workshops were conducted. Moderation of each of these workshops was a responsibility of an expert in a particular area. The workshops were attended by 161 people. The work was multi-stage and based on the previously developed methodology. The milestones of the workshops were preliminary reports, developed each time, prior to workshop works, including the determined starting position of Kraków and KOM in a selected aspect of the Smart City. The reports were drawn up on the basis of the existing statistical data and results of analyses. This allowed to formulate partial diagnoses of the current level of development of the city in the context of Smart City. Constant elements of each workshop were SWOT analyses in each of the above-mentioned six Smart City areas, with particular focus on identification of key issues, requiring smart solutions:

- **maps of stakeholders identified with regard to their connection with a particular substantial sector of Smart City;**
- **prioritisation of development directions of KOM, allowing to put into practice selected aspects of Smart City, taking into consideration two key selection criteria of development concepts: their intersubjectively understood importance and objectively existing possibilities of their implementation.**

The diagnostic workshops were supplemented with two workshops integrating problems, conducted with participation of all moderators, as well as workshops with participation of representatives of territorial self-governments comprising the Kraków Metropolitan Area, dedicated to searching for specific metropolitan character of Smart City. The above-presented diagnostic conclusions were developed as a result of joint work.

PRIORITIES RESULTING FROM THE DIAGNOSTIC STAGE FOR SIX AREAS OF KRAKÓW SMART CITY AND KOM

Workshop works allowed to gather different approaches to the development concepts of KOM in accordance with the Smart City paradigm. It shall be noted that the presented catalogue of priorities, due to the diversified character of particular Smart City areas, differs with the level of detail, feasibility of execution or degree of connection with the development priorities of Kraków Metropolitan Area. This aspect is connected with a lack of uniform definition of the Smart City concept, therefore the presented priorities jointly reflect the specific character of Kraków and KOM.

SMART PEOPLE PRIORITIES

The basic dimension of the analysed *Smart People* area refers to the postulated increase of the level of municipal or metropolitan citizen activity as a tool for participative co-establishment of Smart City. A city should rely on creativity and subjectivity of its citizens in designing public services to a greater extent. Such a city is linked with a dense network of multi-channel and permeable interpersonal communication, connecting public administration with citizens. Additionally, Smart City should make use of the potential of representatives of each segment of municipal and agglomeration community, including also those exposed to social exclusion.

Within the *Smart People* concept, people inhabiting a smartly functioning city should be able to jointly break through the silage organizational culture, which frequently dominates in public life, and at the same time put cross-unit cooperation. They are creative people who are capable of using opportunities arising from open access to data concerning city or metropolis in a creative manner. They are people who actively participate in their small homelands, urban and metropolitan space, developing the polycentric character of the urban fabric which surrounds them.

SMART LIVING PRIORITIES

The following basic categories were distinguished among the priorities referring to smart life concept:

- **quality of residence;**
- **health condition - social coherence;**
- **public safety - safety of an individual;**
- **social infrastructure - cultural, educational and social background.**

Looking from the perspective of *smart living* - Smart City or Smart Metropolis is a space of high quality of life, allowing its users for everyday functioning in good health condition, within a network of friendly social relationships, with universal and constant sense of security and full access to cultural, educational and social infrastructure.
Smart urban fabric is a city or metropolis, which offers a citizen space for satisfactory leisure, through availability of the so-called micro-parks, possibility of cultivating municipal horticulture or participation in ecological fairs. It is a city which is friendly for its senior citizens and offers them space for residence adjusted to their needs and possibilities, as well as for persons using health care - through integrated information systems about the availability of services. This is a city which provides its citizens with an opportunity to co-create the surrounding space, for example by means of Participative Spatial Information Systems (PPGIS). Finally, it is a city which protects historically and culturally important areas by creating culture parks.
Additionally, Smart City actively protects its citizens from social exclusion and undertakes activities intended to support local non-governmental organizations by means of activity incubators. Smart municipal or metropolitan space also creates the possibility of harmonious cross-sectoral cooperation. An important aspect in this area is also providing safe public space thanks to the application of modern technologies and high level of mutual trust between uniformed services and citizens. It is a space of conscious citizens who are capable of using cultural facilities of the city in a civilised manner, not colliding with needs of other citizens.
A city functioning on the basis of Smart City paradigm provides its citizens with municipal or metropolitan space which gives them many possibilities of spending free time by taking part in sport, scientific or cultural events. Living in accordance with the "smart" concept is accompanied by many educational opportunities, also related to development and co-creation of municipal space, and using creativity of interdisciplinary student environments.

SMART ENVIRONMENT PRIORITIES

The area related to environment is constituted by three basic strategic lines of smart environment protection: transport (related to optimisation of spatial communication system), leisure (related to use of green areas) and, generally speaking, by aiming to achieve maximum possible clean air in the city.

In the first case, the emphasis is laid on promoting good transport solutions for municipal and agglomeration fabric and for citizens. Within this meaning, Smart City is a city equipped with car parks located at transport junctions and crossed by a network of bicycle paths, with a well-developed tram line network. It is a city whose centre is dominated by collective transport, bikes and pedestrians instead of vehicles. On the other hand, Smart City cares for its green lungs, regarded as a resource worth municipal strategic investments, multi-functional resource, and sometimes a resource originating as a result of renaturalisation, as in the case of river parks, which additionally perform the flood protection function. The environmental aspect refers directly to care for good quality of air in the city, e.g. by developing and implementing "anti-smog resolutions" and programmes intended to reduce low emission, as well as providing citizens with full access to information concerning their participation in cleaning air in the city, e.g. by means of popularising the trend to use the network heat or deep thermal efficiency improvement of buildings.

SMART ECONOMY PRIORITIES

In the economic aspect, the city should be administered in a planned manner, focused on particular goals and means of their implementation. An important element in this area is management of the city with the application of e-government services. Economic municipal fabric is also space covered by local area development plans, and therefore developed in a planned, programmed and optimal manner. In line with the Smart City concept, agglomeration is a network of deliberate connections of spatial inter-commune transport, based on railway transport, within the scope adjusted to the needs and capabilities of inhabitants of particular communes.

Municipal space in *Smart Economy* is also achieved thanks to monitoring of efficiency or providing public services, system of controlling economic processes and particularly harmonious co-existence and cooperation between public administration, inhabitants, companies and tourists.

SMART MOBILITY PRIORITIES

The key mobility issue is the formation of smart system for managing mobility of citizens, good organisation of public transport, taking advantage of the potential of Szybka Kolej Aglomeracyjna (fast suburban rail) and private agglomeration and regional carriers. *Smart Mobility* also refers to smart transport systems (traffic and road sign control), friendly for cyclists and pedestrians. It is also the optimised systems of bicycle paths, developed zones in city centres intended only for pedestrians and omnipresent road lanes for public transport only.

The target assumption for this area is a situation in which the "smart" space user has access to searching and using all offered means of public transport (collective transport, bike, car sharing), using different forms of payment. It is also an educated user who realises the opportunities provided by the implementation of the Smart Mobility concept in the life of municipal and agglomeration fabric.

SMART GOVERNANCE PRIORITIES

Priority defined as smart management mainly refers to providing citizens with tools which will actually make their lives easier, i.e. real e-services developed on the basis of tests of performance qualities of particular information technology systems. *Smart Governance* also means meeting the needs of citizens affected by disability. Smart City is a city which provides its citizens with access to information, as well as obtains information from citizens in a harmonious and ongoing manner. It is an organism which is close to the inhabitants of the city and agglomeration.

The workshop meetings conducted during the first stage of the project "SMART_KOM. Kraków in Smart Cities Network" allowed for juxtaposition of perspectives on a particular solution perceived from different points of view determined by six Smart City issue areas. Thanks to this, Smart City issues appeared to be more coherent and connected with a system of numerous logical links between visions falling contractually within the concept limits of *Smart People, Smart Living, Smart Environment, Smart Economy, Smart Mobility* and *Smart Governance*. It was noted that many projects had horizontal character, just like the very concept of Smart City itself. Also, a number of Smart City development suggestions were highlighted within the framework of conducted works; among them, the following recommendations were included:

- **increase of the scope and extent of social participation;**
- **wider application of e-governance tools;**
- **construction of multi-functional urban spaces;**
- **optimisation of communication system as a binder in municipal and agglomeration fabric.**

CHALLENGES FOR SMART DEVELOPMENT OF THE CITY AND KOM

As a result of the diagnostic stage, several most important challenges faced by Kraków and KOM were distinguished on the ways to establish smart municipal and agglomeration space, frequently combining conclusions from various areas of smart diagnosis. These challenges constituted a basis for further works within the project by forming the programme of study visits and focusing the planning strategy in the field of developing recommendations and solutions in accordance with the adopted Smart City concept.

1. Smart City subject management: current administrative structure or new agency?
A majority of Smart City subjects remain within the competences of various organizational units of the Municipality of Kraków. There are different models of horizontal management of Smart City areas: Forum Virium Helsinki vs. Vienna University of Technology. The variant which mostly reflects Kraków experiences and specific local character should be chosen and fully implemented. An additional challenge is the coordination of Smart City subjects at the level of KOM.

2. Cross-sectoral cooperation
Organisms such as KOM need ongoing cooperation in order to develop. It is necessary to stimulate development of cooperation between various sectors of public life by testing, implementing and developing soft (meetings, direct relations) and hard (hardware and software) tools facilitating multilateral and systematic communication. How to involve citizens effectively in defining problems and needs, and how to involve business and NGOs in solving these problems and fulfilling these needs, including provision of public services?

3. Controlling and monitoring of public services
It is important to develop IT tools, because they provide the opportunity for cheap and efficient monitoring of quality of public services, practically in real time. They also allow to verify the quality of services, as well as provide the possibility of citizen control and evaluation of public services. They make the city more adaptive.

4. Lean management and UX in public e-services
In order to ensure high quality and usefulness of public e-services, it is required to take into consideration the perspective of the end user in designing new e-services, as well as to optimize the existing e-services, using comments and recommendations of the product or service user (user experience).

5. "Methodology of large projects"
Having the experience of unsuccessful projects (e.g. New City around the Main Railway Station), whenever new interesting projects appear, such as e.g. NH projects (Nowa Huta of the Future and NH2), the key thing is to prepare for proper and efficient management of such vast urban processes, which require coordination of parties from different sectors.

6. Multimode transport (including metropolitan transport)

Kraków has become a place of work, studies and various types of services used by hundreds of thousands citizens of the agglomeration, and therefore it is particularly important to connect the agglomeration transport (SKA, buses) with the municipal transport. It is necessary to create the possibility of changing many means of transport to collective transport, or within the collective transport. There is a need for integration and coordination of different transport systems in the KOM area.

7. Polycentric approach to development of Kraków

Although many functional centres bring social and transport benefits, as a matter of fact, Kraków continues to have one centre, connected with the historic Old Town. The question arises, how to manage the city in order to achieve its functional (social and economic) decentralisation and bring the city closer to its citizens, regardless of the area where they live ?

8. Quality of public spaces, including green areas

One of the basic indicators of the quality of life, increasingly significant in Kraków over the last few years. It is a challenge to transform Kraków into a living environment friendly for its citizens from the perspective of such aspects of the quality of life as access to green areas, quality of water and air.

9. Revitalisation projects

Revitalisation should not be understood only as energy retrofitting. There are districts in Kraków
0 where degradation is in progress and which require complex activities (e.g. Azory, Prądnik Biały, Olsza). Such places need complex revitalisation, not only in the spatial and urban dimension, but particularly in the social and economic aspects. Crisis conditions need to be properly identified and fully neutralised. The direction of changes should be deeper and more durable.

10. Air quality (coal, low emission)

Another issue which is strongly discussed in recent years is the problem of air pollution. There is a need for system-based actions, as well as education and work on changes of attitudes of citizens. Representatives of various environments should form a coalition for reducing low emission both in Kraków and the entire KOM.

11. Senior citizen policy and silver economy

Demographic trends are inevitable. Kraków and KOM are getting older and we must prepare for it, starting with the development of the so-called silver economy services and ending with municipal infrastructure, adjusted to the needs of elderly people.

12. Health prevention

"Better prevent than cure" - prevention will always be cheaper than treatment. In the opinion of experts, until now, preventive activities in the territory of KOM were action-based and dispersed, therefore, their potential was used only to a small degree. KOM requires systemic and integrated solutions, taking into consideration target groups: children, seniors, people at risk of civilization diseases and cancers.

13. Systemic approach to persons with dysfunctions

Kraków and KOM are not ready for integration of this group of citizens. There is a need for activities oriented towards inclusion of people with disabilities, activation of the unemployed and helpless in the face of life, as well as addicts and homeless.

14. Public safety, trust in uniformed services

Although subjective feelings of citizens and statistics indicate improvement of security, the services still do not have full knowledge about many problems. A majority of citizens are too passive and do not react to public disturbances, even by providing information. On the one hand, it is necessary to undertake activities intended to raise the awareness of civic responsibility for reporting various types of security threats, while on the other hand, it is also required to ensure proper channels allowing to remain anonymous, protect personal data and provide quick intervention.

15. Conversion of R&D potential and creative industry with business

If economic development was proportional to the academic and cultural potential, Kraków would be the richest city in Poland. How can the city help this conversion ?

16. Open data and big data for new concepts of the city and businesses

The city is a vast repository of data. Therefore, it is necessary to provide access and open these data, which will bring measurable business benefits, as well as higher efficiency and transparency of activities of public administration.

SMART CITY IN THE EYES OF LEADERS OF COMMUNES COMPRISING KOM

During diagnostic workshops conducted with participation of leaders of units of territorial self-government in KOM communes (Kraków and 14 nearby communes), four thematic Smart City areas with the highest conceptual potential in the context of smart agglomeration were distinguished. These include:

- cross-institutional and cross-sectoral communication and coordination;
- agglomeration transport;
- digitalisation of services
- multifunctional green areas.
-

THE FOLLOWING PROPOSALS WERE DEVELOPED IN PARTICULAR THEMATIC AREAS:

CROSS-INSTITUTIONAL AND CROSS-SECTORAL COMMUNICATION AND COORDINATION

NO.	PRIORITIES
1	Determination of the function of Stowarzyszenie Metropolia Krakowska (Kraków Metropolitan Association) supporting the implementation of ZIT (Integrated Territorial Investments). Specification of principles of action, scope of action, procedures, principles of office operation (entitlements, size and pattern of representation of particular institutions), determination of functions of the association apart from coordinating the implementation of ZIT: transport, economy, environment protection, joint tenders, culture, tourism (here - development of offer outside Kraków, using green areas and local attractions).
2	Intercommunal cooperation executed with the help of Local Action Groups, as well as intercommunal cooperation forums at MISTIA (Malopolska Institute of Local Government and Administration), informal forums, providing space for exchange of experiences and searching areas for cooperation. High importance of GOPS (Communal Social Welfare Centre) and MARR (Malopolska Agency for Regional Development) in coordinating intercommunal cooperation.
3	Organisation of mobile intercommunal consultations, e.g. through visits of experts in particular communes.
4	Organisation of intercommunal Investor Service Centres generating cooperation instead of competition.

5	Organisation of mobile vocational guidance in cooperation with the university sector.
6	Establishment of NGOs of supracommunal significance, arrangement of forum for cooperation between NGOs from different communes, establishment of communication channels between NGOs through development of a dedicated online platform.
7	Implementation of interactive platform of intercommunal information including the calendar of cultural events, tourist route information, etc.
8	Intercommunal cooperation on the operational level: exchange of good practices, joint implementation of projects.
9	Coordination of development of social infrastructure, cataloguing information about the infrastructure (e.g. schools, swimming pools, etc.).
10	Coordination of information flow concerning medical services in the commune.
11	Coordination of transport systems - connecting car parks, trams, etc., providing quick transport in the intercommunal space.
12	Development of a map of social services.
13	Cooperation between communes, companies and universities for the purpose of planning university specialisations (research on employment supply and demand).

AGGLOMERATION TRANSPORT

NO.	PRIORITIES
1	Reduction of transit times in the means of public transportation (which is also in the interest of transport companies).
2	Focus on providing updated travel information for users Coordination of research on communication pipes.
3	Increase of the number of intercommunal connections.
4	Improvement of the quality of road infrastructure, increase of the number of bus passes, tram lines, higher number of bicycle paths.
5	Organisation of car parks at transport junctions and park-and-ride facilities.
6	Integration of MPK (Municipal Transport Company) stops and railway stations, thanks to which the implementation of an integrated agglomeration ticket would make more sense. In the case of agglomeration ticket, its implementation should be accompanied by technology enabling to register entries on the bus, transit times, etc.
7	Overcoming the conflict of interest between private carriers for the purpose of cooperation and co-establishment of agglomeration transport system.

8	Better efficiency of e-services in order to reduce the necessity of transit to offices, in certain cases, so that the only necessary transit routes should be: home-work and home-school.
9	Launch of agglomeration information system "How I get there" for all means of transport.
10	Wider application of car-pooling systems and common travel to the same destination. Possible occurrence of the "snob barrier" of car users.
11	Improvement of the ticket distribution network.

DIGITALISATION OF SERVICES

NO.	PRIORITIES
1	The pioneering role of Małopolski System Informacji Medycznej (Malopolska Medical Information System) introduced in 2015. Seven hospitals are covered by the Programme, there is a proposal to extend the tool in a manner allowing to cover ZOZ (Health Service Institutions) and specialist doctors operating in particular communes.
2	Launching of one coherent platform presenting offer of NGOs referring to organisation of after-school activities and free time.
3	Aiming at the implementation of the idea of Cyfrowa Malopolska (Digital Malopolska, 128 services) by popularisation of electronic signature and necessary update of legal regulations.
4	Launch of a platform facilitating intercommunal spatial planning.
5	Exchange of information concerning the calendar of events by means of online information platform. Development of common calendar of events.
6	Launch of e-services allowing for organisation of free time by public and private units.
7	Launch of spatial data flow between particular institutions free of charge.
8	Development of digital resources of the open data type.
9	Standardisation of e-designs at the domestic level.

MULTIFUNCTIONAL GREEN AREAS

NO.	PRIORITIES
1	Defining needs of users and segmentation of user categories as a key to determine functions of various green zones and areas.
2	Development of places with the highest traffic concentration.
3	Raising the awareness levels of JST (local government units) representatives concerning ownership relations in connection with the green areas.
4	Raising the level of knowledge of JST (local government units) representatives concerning the value of particular areas in order to prevent their privatisation.
5	Education and raising the awareness of private owners of green areas concerning the value of possessed areas.
6	Maintaining the inventory of green areas.
7	Necessity of providing legal regulations with reference to ownership relations for green areas.
8	Increase of the availability of green areas, e.g. by turning the face of the city towards the Vistula River and other rivers or streams.
9	Solving the problem of limited use of protected green areas, resulting from the position of relevant institutions or private owners.
10	Development of infrastructure - access to green areas and between green areas. Network of car parks and direct access to river banks.
11	Necessity of using legal and financial instruments in order to acquire green areas for public use.
12	Necessity of protecting green areas in spatial planning. Necessity of protecting certain areas and relevant specification of their function in development plans.
13	Securing "green belts" around cities.

SUMMARY

Results of the first stage of project "SMART_KOM. Kraków in Smart Cities Network" allowed to look at the perspectives of development of Kraków Metropolitan Area in accordance with the Smart City concept with moderate optimism. The development directions initially suggested by experts and representatives of KOM communes, i.e. Biskupice, Czernichów, Igołomia-Wawrzeńczyce, Kocmyrzów-Luborzyca, Liszki, Michałowice, Mogilany, Niepołomice, Skawina, Świątniki Górne, Wieliczka, Wielka Wieś, Zabierzów and Zielonki were mostly very time-consuming and capital-intensive visions. However, we managed to establish an expanded concept database, which was a source of inspiration for the team responsible for implementation of the Smart City concept in the life of Kraków and metropolitan urban fabric at the later stages of the project.

Additionally, taking into consideration the above-mentioned synthesis of priorities, two strongly rooted ways of thinking were noted:

- **spatial** - aiming at densification of the network of connections between the man and the surrounding space, by enabling him to move efficiently within this space and participate in its establishment and shaping, adjusted to his needs;
- **digital** - aiming at empowerment of citizens by providing him with modern tools for co-managing, co-deciding and participating in interpersonal, cross-institutional and cross-sectoral communication, based on full access to information.

Works within the framework of subsequent stages of project SMART_KOM completely took these paradigms into consideration. The diagnostic stage also allowed to consider the strategic decision which was to be taken during the third stage of the project, i.e. to decide how the Smart City concept for Kraków and KOM should be defined - in the so-called narrow or wide approach, because two definition approaches are distinguished for the problems of Smart Cities:

- **narrow** - incorporating Smart City within the tight framework of information and communications technologies (ICT), with all their positive and negative consequences. Positive - due to the formal order of performed analyses and resulting facility of zero-one categorisation of solutions as remaining within or outside the limits of the Smart City paradigm. Negative - due to the risk of conceptual fixation on new technologies;
- **wide** - less precise, regarding the Smart City concept in many aspects as a set containing any type of systemic enhancements improving the quality of functioning of the city and metropolitan areas, as well as the quality of living of citizens. The obvious advantage of such approach is the diversity and multi-threading of suggestions, as well as holistic attitude to the development of urban fabric, whereas the disadvantage is the far-reaching blurring of the definition limits of Smart City, which is a significant obstacle for distinguishing between the concepts remaining within the Smart City paradigm and common concepts, which does not mean: frequently met in city administration - examples of common sense.

This postulate was the starting point for the third stage of project "SMART_KOM. Kraków in Smart Cities Network"[3], within which works on the SMART_KOM strategy were carried out, resulting in the development of "Roadmap for smart solutions in Kraków Metropolitan Area". Finally the definition combining both of the above approaches to the Smart City concept were selected in the context of Kraków and KOM.

3 The second stage of project "SMART_KOM. Kraków in Smart Cities Network" was focused on study visits, i.e. it had the supporting character, supplementary for the first (diagnostic) stage of the project.

POSITION OF KRAKÓW IN COMPARISON WITH OTHER EUROPEAN CITIES - RESULTS OF BENCHMARKING STUDY

The benchmarking study whose results are provided below, was performed by the team consisting of prof. Rudolf Giffinger, Florian Strohmayer and Hans Kramar, representing the Vienna University of Technology. The purpose of the study was to establish the position of Kraków in comparison with other European cities in the context of implementation of the Smart City concept. This chapter was based on the report drawn up by prof. Rudolf Giffinger, prepared for Kraków within the framework of project „SMART_KOM. Kraków in Smart Cities Network".

To begin the analysis of the situation of Kraków, it is worth looking at three important statements, which form the context for the performed benchmarking analysis

First of all: globalisation of economy and social and economic changes are factors which force European cities to adopt an increasingly competitive attitude. Due to that, they have to face new challenges resulting from the lack of social and territorial coherence, insufficient housing resources, deteriorating quality of natural environment and increasing energy consumption more frequently. These problems occur either as independent trends or interconnected phenomena. Despite the occurrence of these phenomena, cities must find balance between economic competitiveness and good living standard for citizens. The need for increasing own competitiveness on the one hands, and care for high quality of living on the other hand, are becoming a central problem of urban development (Begg, 1999).

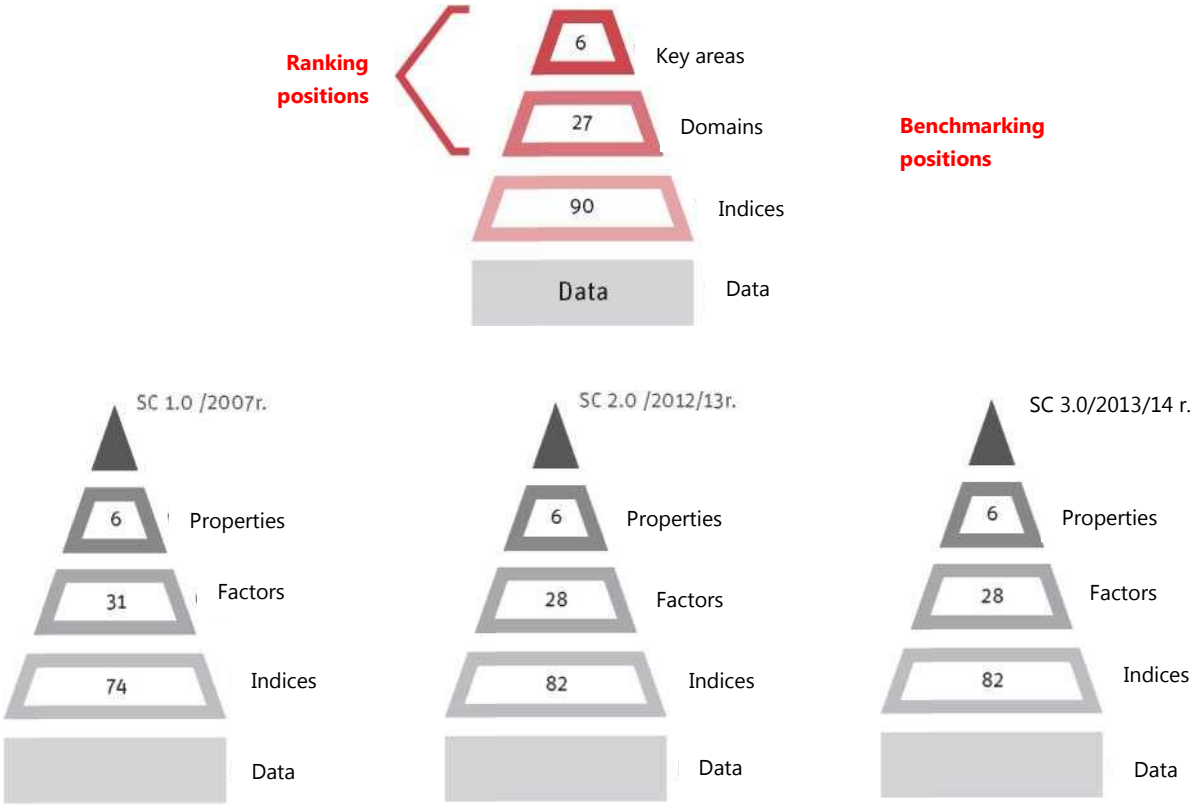
Secondly: taking into consideration these complex tendencies and changing challenges, cities are forced to redefine their own strategic positions within the urban system in Europe. However, strategic positioning is a highly complex task, which should be based on integrated and interdisciplinary approach. This process must include the participation of various stakeholders and social groups, because this is the only way to secure substantial discussions and appropriate course of the processes of gaining knowledge, which are necessary conditions for common decision-taking (Dameri et al. 2014).

Thirdly: in order to meet these challenges, it is necessary to gain empirical evidence enabling to provide a clear description of the results of the city in particular key areas, as well as to determine its strong and weak sides. Development of particular profiles in all essential aspects of urban development is a condition not only for performing a comparative analysis with other cities, but also for implementing an effective problem-solving process (Giffinger et al., 2010). That was the purpose of performing the benchmarking study for Kraków.

EUROPEAN SMART CITY MODEL

The Vienna University of Technology team has been working on the problem of Smart Cities since 2007. The result of these works was the development of the European Smart City Model. This model assumes holistic approach to profiling and comparative analysis of medium-sized European cities and is considered as an instrument allowing to implement effective cognitive processes in the field of urban innovations in particular areas of urban development. Currently, the so-called fourth edition of the Smart City model (after earlier modifications) is available. it should be remembered that due to use of various sources of data and implemented changes (at the model level), as well as improvement of definition of indices, direct comparison of the results of these four models is not possible. In the fourth edition (SC 4.0), Smart Cities are finally described in 6 key areas, 27 scopes and 90 indices. The analysis for Kraków was also performed on the basis of the above-mentioned model.

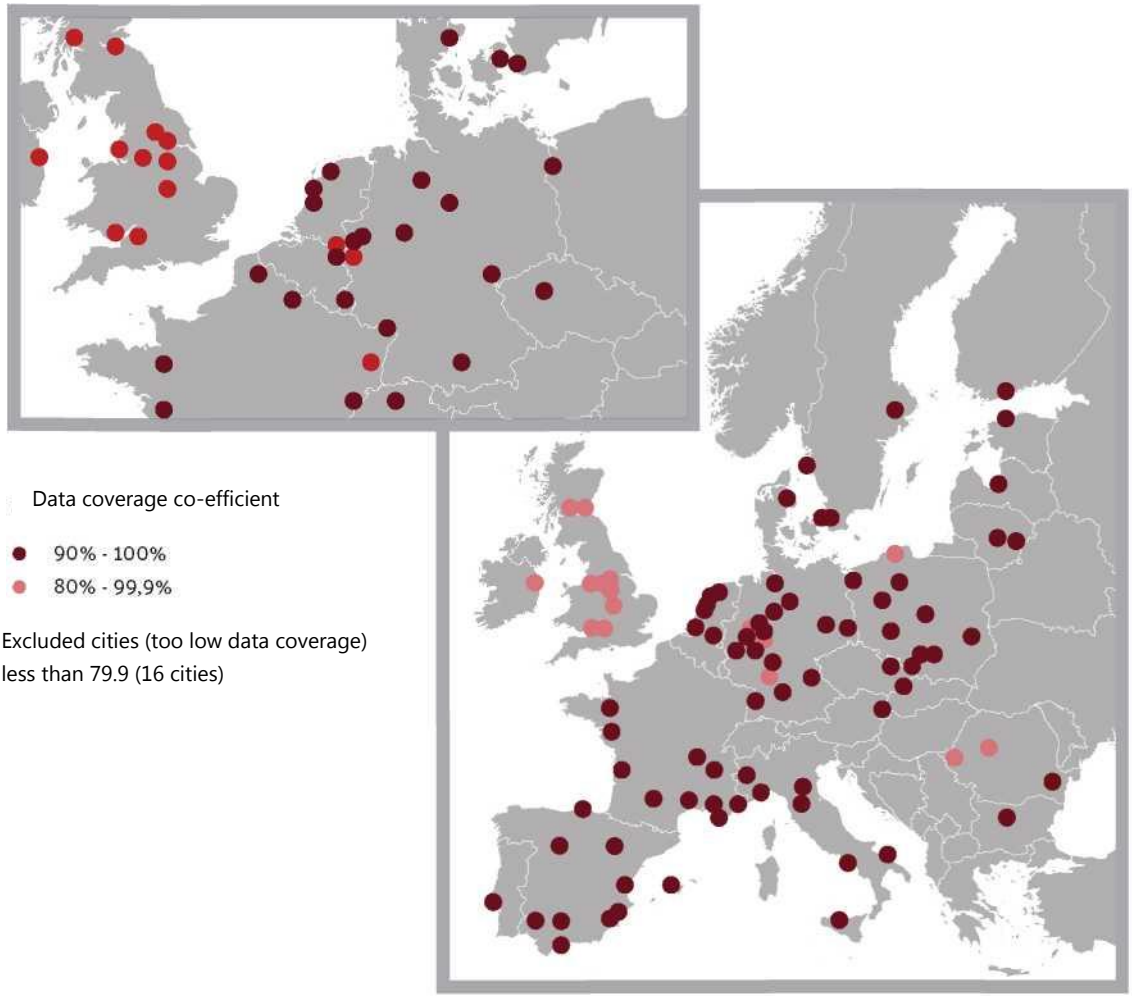
SMART CITY MODEL



The results of the analysis were prepared together with Kraków Technology Park and the City of Kraków. As mentioned before, the SC 4.0 model is based on previous models. This means that the approach, concept and general motivation are the same as in previous Smart City research projects However, the evaluation during the project was based on the database of model SC 3.0. Models from SC 1.0 to SC 3.0 concerned medium-sized European cities with not more than 500,000 inhabitants, whereas the population of Kraków is more than 750,000, which caused the necessity of reconsideration of samples of cities.

In some cases, it was not possible to capture the city in its actual shape due too excessively narrow or wide administrative borders. In order to operationalise the most appropriate indices, it was necessary to focus on cities in their basic forms (administrative borders), not taking into consideration definitions of larger areas or larger urban zones. In the end, 90 cities from 21 countries, with the population between 300,000 and 1 million citizens, were analysed (see map and chart.[4]

4 The results of the benchmarking study can be found under the following address:http://www.smart-cities.eu/?cid=01&ver=4



Another important element was the evaluation of existing indices together with the project partners. Generally speaking, European public databases are not static. Certain indices included in versions S.C. 1.0 - S.C. 3.0 of the project are no longer available on the Internet, sometimes their definitions changed over the years, and in some cases they are supplemented with new indices. This means that each index was analysed with regard to possible availability of new significant information. The project partners in Kraków performed a comparison of all essential data for Kraków in order to avoid any discrepancies between the results and the standards. In 21 cases, project partners provided changed or updated data and additional information collected from various local, regional and domestic sources. In the end, the set consists of indices from different sources:

- Eurostat (based on 16 indices);
- „Audyt miejski" (Urban Audit) reports (based on 32 indices);
- „Percepcja audytu miejskiego" (Perception of urban audit) (based on 26 indices);
- Eurobarometr (based on 11 indices);
- ESPON (based on 3 indices);
- MastersPortal.eu (based on 2 indices).

In the end, 88 indices were used for Kraków, including 3 domestic and 2 regional indices.

GENERAL RESULTS FOR KRAKÓW

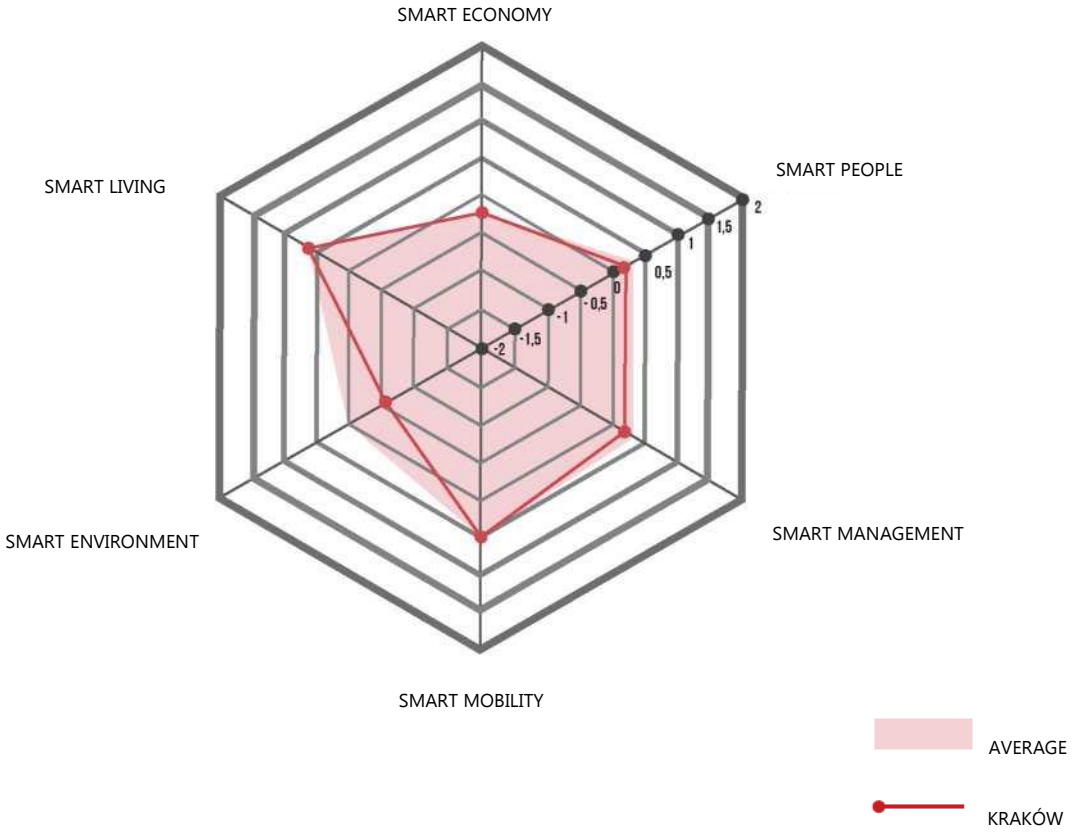
The purpose of the benchmarking study performed within the framework of the research project European Smart Cities was to establish the position of Kraków in six Smart City areas: people, living, economy, environment, mobility and governance, in comparison with a sample of 90 European cities. The cities with a population between 300,000 and 1 million inhabitants from 21 countries, including 9 cities from Poland (Bydgoszcz, Gdańsk, Katowice, Kraków, Łódź, Lublin, Poznań, Szczecin, Wrocław) were analysed. The sample of tested cities included Western European countries, as well as Central and Eastern European countries.

For all 90 cities, the reference year was 2009, because data from that year were complete and most up-to-date. In the end, 88 indices were used for Kraków, which means a relatively high cover: approximately 98 %. Taking this into consideration, the results of the study should be regarded in the category of trends characteristic for Kraków, bearing in mind that particular phenomena could have changed over the last six years.

In accordance with the adopted research methodology, Smart City basically means the following: a city achieving good results in six key areas, based on "smart" combination of resources and activities undertaken by decision-making, independent and aware citizens (Giffinger et al., 2007).

With the population of 761,900,[5], Kraków is currently the second biggest city in Poland. In comparison with other large cities in Europe (with population between 300,000 and 1 million inhabitants), Kraków demonstrates features close to the European average: in a majority of key areas, these values are close to the average specified as median for the sample of 90 European cities. The only exceptions refer to the following areas: environment, where the results are relatively low, and living, where the results are clearly high. Despite these two differences, the spider graph for Kraków indicates sustainable development in all key areas.

KRAKÓW PROFILES



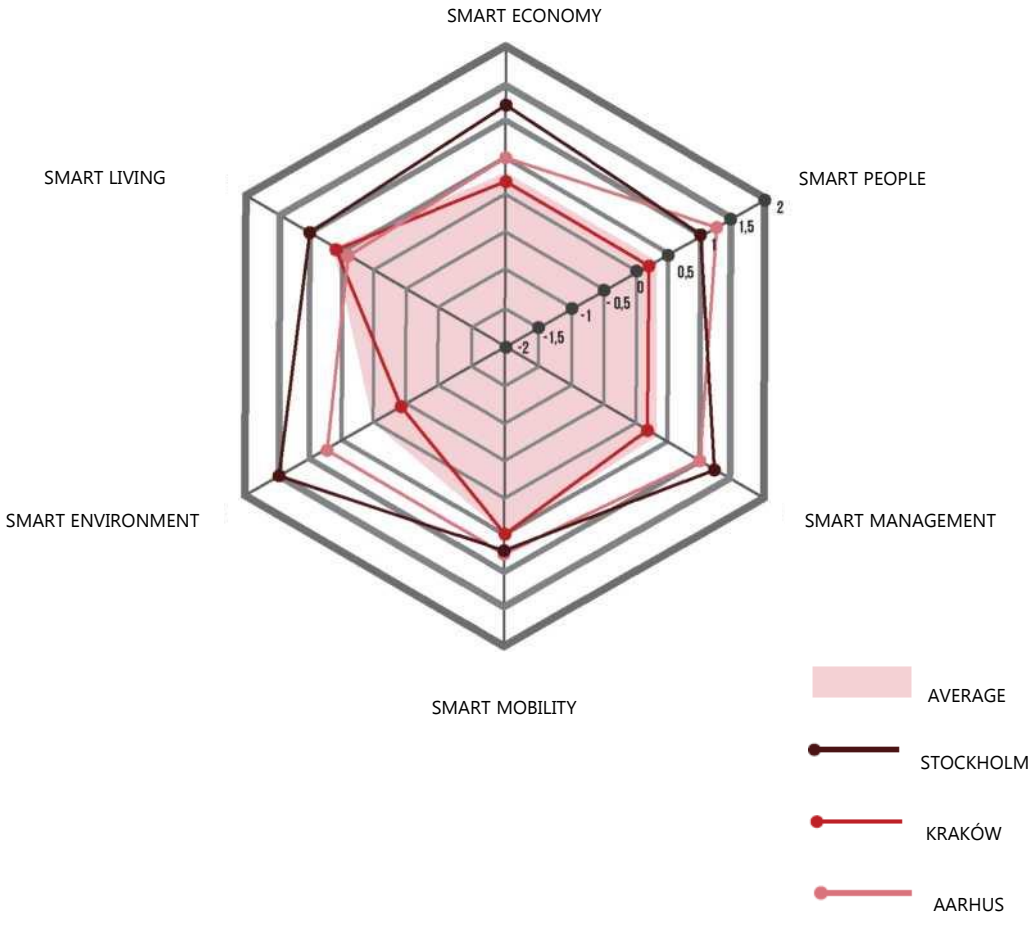
5 Status as of 31 December 2014

The comparative perspective clearly demonstrates that cities from Scandinavian countries, such as Aarhus or Stockholm, achieve relatively better results. However, Stockholm, as a capital city, achieves relatively balanced results in all key areas, whereas Aarhus demonstrates deficiencies in living and economy areas. The results of Kraków are very similar to Aarhus, at least in the case of the key area, "Living".

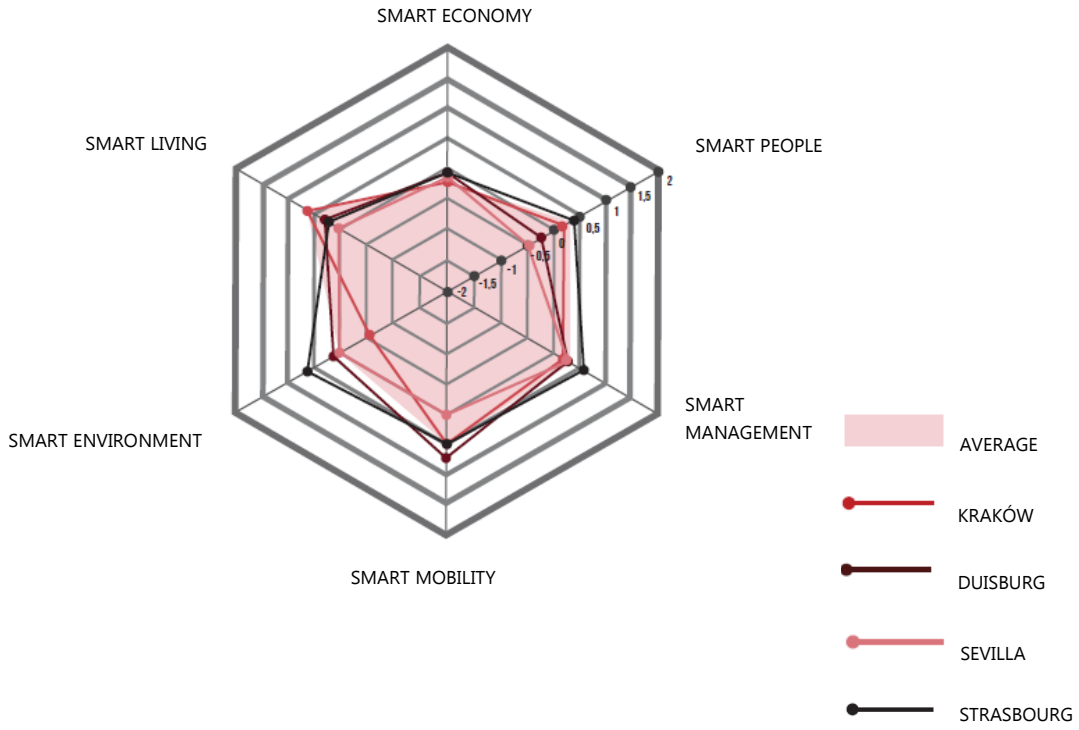
In comparison with other European cities, such as Duisburg, Sevilla or Strasbourg, the profile of Kraków is exceptionally balanced. Industrial cities, as well as cities of Southern Europe, are clearly characterised by relatively unbalanced results in six key areas. The high level of imbalance between mobility and other key areas is quite problematic. However, the key area "environment" demonstrates significant deficiencies even in comparison with other cities, whose general results are not equally good.
In comparison with all cities taken into consideration in the analysis, Kraków is located in the lower area of the middle part of the ranking. In the group of 90 large European cities, the results of Kraków are close, but frequently lower than the average values for Europe. At the same time, it is clear that Kraków presents itself better than a majority of other cities in the Eastern and Southern Europe. Apart from Kraków, only Gdańsk, Tallinn, Wrocław, Brno and Bratislava achieve similar results.

These outstanding achievements of Kraków in a balanced manner in nearly all key areas were also confirmed by the comparative analysis with other large cities in Poland. A majority of cities in this group have balanced profiles, with the exception of Poznań, Szczecin and Bydgoszcz. For obvious reasons, all Polish cities have the biggest deficiencies in the economy area. Also Kraków has a low result in this area, although the result in environment area is even lower. The zero line on the below chart indicates European average specified as the average value (not median).

PROFILES OF KRAKÓW, AARHUS, STOCKHOLM



PROFILES OF KRAKÓW, DUISBURG, SEVILLA, STRASBOURG



BELOW ARE PRESENTED RESULTS FOR KRAKÓW IN 6 ANALYSED SMART CITY AREAS.[6]

The key area - smart living (quality of life) is the area in which Kraków achieves the best results, however, the results in particular domains (sub-areas) are relatively heterogeneous. Clear deficiencies occur in the "health conditions" domain. This deficiency results from a low quality of air, as well as long-term trends, which were not reversed in recent years.
At the same time, Kraków achieves high results in the "individual safety" domain, which results from good safety conditions, as well as relatively positive experience of inhabitants. Kraków, as an academic centre, offers an impressively high standard of educational institutions. For this reason, it is very attractive in terms of educational and academic offer. This means that it has valuable resources conditioning an increase of human capital in the city.

It is natural that resources in the living area mean potential for future development. As noticed by prof. Rudolf Giffinger, based on the research results, due to the direct relationship with air quality, an improvement of health conditions may take place thanks to planning activities intended to reduce the use of private vehicles and low emission in housing districts. Thermal modernisation of buildings will not only lead to improvement of housing standards, but also contribute to improvement of air quality thanks to replacement of old heating systems with energy-saving systems. It also suggests that municipal units responsible for spatial planning should support local neighbour initiatives, intended to improve the quality of life through local activities.

6 Full version of the report is available under the following address: http://www.smart-cities.eu/?cid=01&ver=4

ECONOMY

The second key area subject to analysis is smart economy (economy). In this area, the "innovative spirit" domain achieves relatively low results due to deficiencies in the field of economic activity based on knowledge, lack of patent applications and relatively low level of expenditure for research and development works.
At the same time, the "entrepreneurship" domain has become an advantage to certain degree. The economic changes are accompanied by establishment of new companies and higher index of self-employment, however, we should mention the negative phenomenon, i.e. relatively low survival of new companies (the first 3 years are critical).
In light of these discrepancies, characteristic for the period of economic changes, it is recommended to undertake strategic activities intended for a broadly understood increase of financial and organisational support for new and innovative initiatives (e.g. new centres supporting founders), as well as enhancement of initiatives providing platforms and infrastructure facilitating cooperation on a domestic and international level.

ENVIRONMENT

In this key area, Kraków clearly achieves low results. The results in particular domains are below the European average. A particularly problematic area is "air quality", due to the high concentration of dust in the air and smog sensed by inhabitants (according to responses in the survey), and leading to fatal chronic illnesses of lower respiratory tract. Moreover, no results above the European average have been reported in any domain. There are clear deficiencies even in the "sustainable resource management" domain, indicating that low air quality is not only caused by unfavourable geographical location, but is also an effect of insufficient public awareness and activities.

Due to unsatisfactory results in all domains related to the environment, it is recommended to monitor the environmental development and subject to public debate issues such as e.g. emissions from private vehicles, coal combustion in households and quality of water in rivers. Additionally, the public transport network, as well as heating network, needs to be expanded as soon as possible, particularly in the new housing districts. Close cooperation between units responsible for spatial planning, public transport companies and energy plants is necessary. Public subsidies (through EU or domestic funding) and domestic programmes should encourage creation of "green jobs".

MOBILITY

Another key area is smart mobility (mobility). In this area, key results are relatively balanced in a majority of domains. On the one hand, there are small deficiencies in the "balanced transport system" domain, resulting from the small importance of public transport in comparison with the frequency of using private vehicles and low level of road security. On the other hand, the information and communications infrastructure seems to be relatively well-developed, whereas international availability is below the European average.
Taking into consideration the results achieved in particular domains of "Smart Mobility" area, it seems to be essential to undertake strategic activities intended to continue the expansion of information and communications infrastructure, as well as improve the international availability by setting up new connections, as well as enhance and modernise technical infrastructure. Additionally, the problem of mobility must be more strictly connected with sustainable development. The concepts and investments in mobility should particularly promote active mobility (bicycle and pedestrian traffic), integrated transport system and multimode infrastructure.

PEOPLE

In this key areas, the largest deficiencies occur in the field of "continuous education" domain. This means that the inhabitants fail to continue education or rarely use books or other media during their professional work. It shows that the concept of lifelong learning has not been rooted among the citizens of Kraków yet.

It is evident that "open-mindedness" can be included among the resources possessed by the citizens of Kraków, who are characterised by low level of discrimination, use of modern forms of interaction with public authorities, as well as well-established European awareness, internationality and positive attitude to foreigners (especially tourists).

PUBLIC MANAGEMENT

The "political awareness" domain demonstrates significant deficiencies in the area of pro-European activity (low participation on the European level) and involvement of women in public life. At the same time, none of the domains is characterised by strong resources. The "efficient and transparent administration" domain gives hope for smart development of public municipal authorities. Taking the above results into consideration,

the authors of the report recommend that the process of European integration and the problem of gender equality should become a subject of public debate with the application of a modern administrative system and approval of public and social services. Moreover, these issues should be discussed at the local level, in schools, press, electronic media and during related events.

SUMMARY

Almost every city faces two contradictory challenges: increase of own competitiveness and enhancement of sustainable development of urban areas. One frequently happens at the expense of the other. Based on the performed study, it can be concluded that sustainable development in all key areas does take place in Kraków, however, there are strong differences in the operational efficiency. This constitutes a difficult challenge and requires preparation of a complex action plan, as well as clear determination of priorities for the development of the city and agglomeration within the next few years.

On the basis of results of recommendations from the benchmarking study, the action plan for Kraków should take into consideration the following actions:

- enhancement **of sustainable development in all key areas, in particular enhancement of economic actions based on knowledge;**
- solving **environmental problems;**
- enhancement **of social and territorial coherence through transparent and integrating activities on the local level;**
- promotion **of cultural and social events for particular groups and districts;**
- improvement **of tourist attractiveness and avoidance of the risk of gentrification;**
- stimulation **of thermal modernisation through relevant subsidies and participation of all stakeholders;**

It is worth noticing that a majority of challenges defined in particular key areas or domains and recommendations, are confirmed in strategic documents of Kraków, Malopolska Region, as well as general and detailed recommendations drawn up in the form of "Roadmap" within project "SMART_KOM. Kraków in Smart Cities Network".

Some of the draft recommendations have already been implemented. A special smart city team was created in the Kraków City Hall. Its main task is coordination and monitoring of innovative (smart) solutions implemented or planned to be implemented in Kraków.

Living Lab is, in a way, structured design thinking: service which allows to test and optimise a new product or service by maximum reduction of distance between the creator of technology (product, service) and end users.
What does it mean in practice? A series of focus studies on a strictly targeted group, performed by competent living lab trainers in accordance with specified scenarios and with the application of proper methodological tools, in close cooperation with a particular company. Therefore, it is a combination of business coaching and social/consumer research in an iterative (repeatable) manner, testing and validating subsequent stages of work on product, from the concept, through the prototype, to actual implementation.

KRAKÓW TECHNOLOGY PARK TOGETHER WITH KRAKÓW CITY HALL ESTABLISHED KRAKÓW LIVING LAB, I.E. ECO_SYSTEM OF SUPPORT FOR COMPANIES OPERATING IN THE SMART CITY AREA, WHERE NEW PRODUCTS AND SERVICES ARE TESTED.

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Thanks to cooperation with the City of Kraków and Malopolska Region, it is possible to test the product or service in the natural environment of its use. If required, it could be done in the street or municipal park.

STRATEGY AND RECOMMENDATIONS

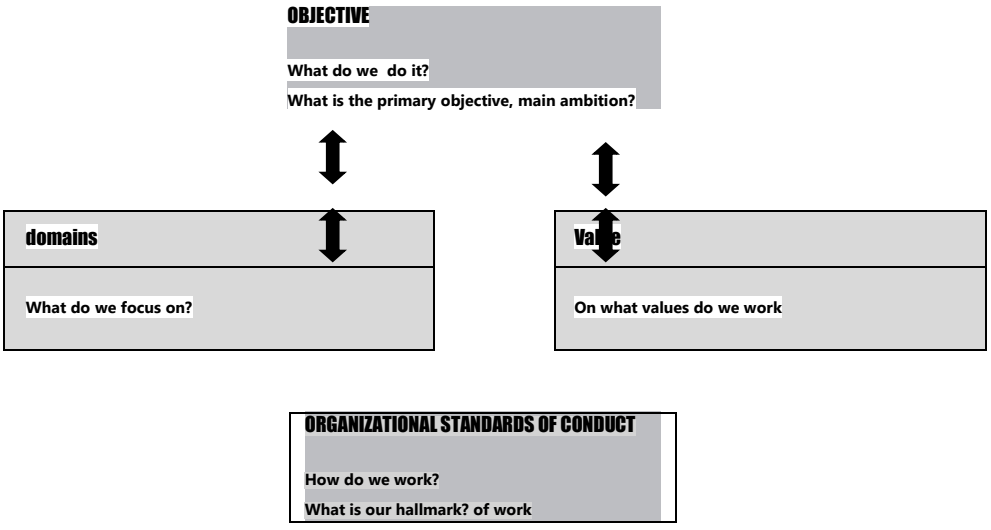
The basis of work on each strategy, in this case, the strategy of SMART_KOM, always means the necessity to make an in-depth and precise reflection on fundamental assumptions, on answers to the basic questions

This part is the core of "the road map related to smart solutions in Kraków and KOM." It consists of: the development mission in the Ashridge model comprising four elements , the concept of adaptive city and recommendations for public policies. The first approximation of directions takes place in this part of strategy, in which we would like to develop the Kraków Metropolitan Area in an intelligent way. The mission of development and the concept of adaptive city are the pillars which about the objective, on principles we formulate strategic intent on, and finally on the ways of action taken.

build up a new holistic approach to the management of city in the spirit of the concept of a smart city. The proposals of recommendation constitute their development, that is, tips and guidelines where the development of smart area should be started from, conducting the policy of development at individual levels of local government with the support of entities in the social and business sector and residents.

MISSION OF THE DEVELOPMENT OF A SMART CITY

The Mission of SMART_KOM strategy, formulated according to the 4-element model of Ashridge, provides the answer to the key questions related to the building of strategy. It includes questions primary objective (the main aspiration of development), concerning the values, which are based on the foundations of strategy, as well as questions concerning basic areas of activity (strategic development domain) and standards of organizational conduct distinguishing it from other strategies. Putting such in-depth questions with respect to new, innovative project, for which there is no proven home-worked out solutions was particularly important, and the international "good examples" do not always correspond to our experience and reality. After all, the point was not to copy fragmentary ways of action, but to create a comprehensive and coherent concept of the "smart city" and KOM.

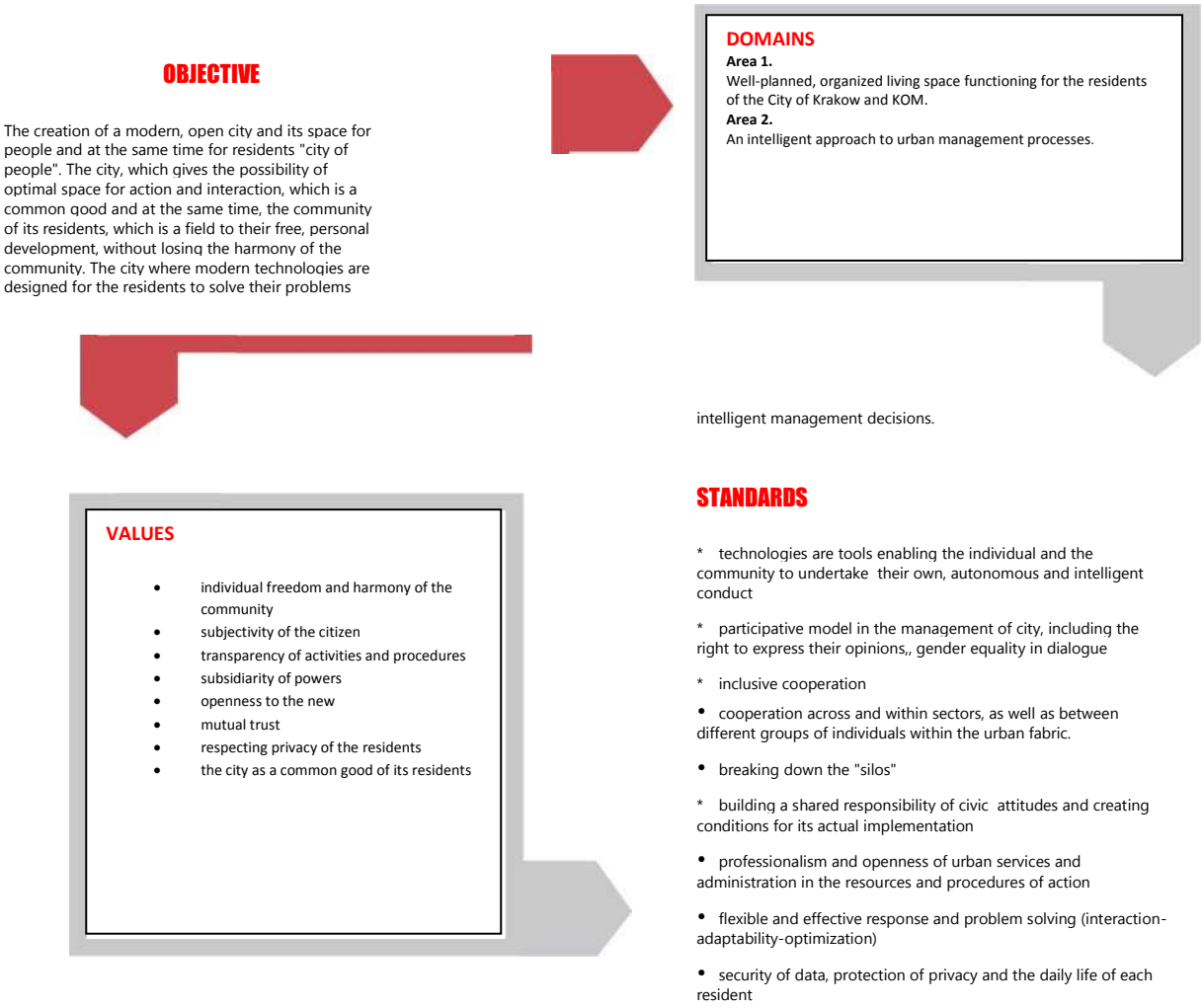


In multi-threaded discussions with experts from various disciplines and institutions the answers to the above questions were provided, formulating the description of mission, or to put it more precisely, the so-called sense of mission. It distinguishes the mission formulated in this way from the declaration of mission, which is usually an entry consisting of one sentence of promotional and informative nature. Such distinction was introduced in the early 1990s by A. Campbell from Ashridge Strategic Center [7]and just on this model of mission the initial studies on the formulation of development trends were based as part of the SMART_KOM Strategy.

The discussion and development of the mission according to the model described gave rise to the formulation of the Concept of Adaptive City, and then to the formulation of recommendation for municipal policies and eventually it became the key (strategic) selection criterion of projects to the SMART_KOM Strategy. The mission formulated in this way, gives clear and precise indications as to the choice of the key strategic areas and development trends on the one hand, and, on the other hand, it is a very important community and motivation factor for those working on the issue of smart city.

Below you will find a record of the mission of the development of smart city for Kraków and KOM.

CONCEPT OF ADAPTIVE CITY



7 A. Campbell, M Devine, D. Young " A Sense of Mission, "The Economist Books, London 1990

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Kraków •

OBJECTIVE

The primary objective strongly indicates that what is most important in the approach to the building of smart city for Kraków and KOM and what will be visible throughout the strategic document. The resident and the fulfilment of his needs is the most important thing in harmony with the value of community. The specified main objective highlights the balance between the development of individual and the welfare of community, as well as the balance in relation to modern technologies the development of which is not the end in itself. Hence, the objective strongly emphasizes that the "smart" strategy means much more than technologies intended to serve only as a tool for solving the problems of residents.

Value

In the accepted model of mission, specifying the main objective of the mission is not enough. It is very important to answer the question what values are fundamental and undeniable for us. In the mission the indicated values are very compatible with the primary objective, and they apply both to:

- the individual- the values indicated relating to the freedom of development-the city creates space for residents for free development, to the subjectivity and respect for privacy, the city does not restrict their activities and development;
- community-values, which indicate the city as a common welfare, the harmony of community;
- collective life-values of trust, openness, and transparency.

DOMAINS

The domains indicate the areas of the implementation of the primary objective on which the development of Kraków and KOM will be focused on towards a smart city. Two essential areas were outlined for SMART_KOM strategy:

- Area 1 Well planned, organised and functioning space for life for the residents of the city of Kraków
- Area 2: Intelligent approach to the management of urban processes

It means the abandonment of silo, discipline understanding of domains (e.g. transport, environment, people) towards integrated "essential" understanding. The objective of the city is to serve the people, their comfort, needs and aspirations. This is a quality of life understood widely and as a whole, covering different aspects of the functioning of resident and the city The first suggested area corresponds mainly to it. However, the focus on the quality of life of the residents means, among other things, that the approach both to public policies and to the structure of city management must change. Thus, a "smart" approach to the process management must follow at the same time, and this aspect has been included in the second indicated area of strategic development.

STANDARDS OF CONDUCT

Standards of organizational conduct constitute a record of certain specifically identified principles, standards or guidelines related to the methods of the implementation of the main objective, value, and domains. Standards of conduct for SMART_KOM Strategies indicated, emphasize a couple of fundamental principles, you should be guided by when implementing the idea of smart city and KOM, i.e.:

- there is no smart city without new technologies, but they should be introduced into social fabric skilfully. Solutions based on technologies should activate, and not only be the subject of passive consumption;

- Common understanding that joint action, participation, involvement in urban processes will actually contribute to the improvement of the quality of life of residents is very important;
- It is necessary to change the administration's approach towards open administration, open in the understanding of resources and procedures;
- proposing any smart solutions must be implemented respecting the principles of data security and the protection of privacy.

The mission of the development of smart city for Kraków worked out in Ashridge model should be read as a whole. The answers to the four key questions are mutually complementary and give basic sense to further strategic works. Moreover, the mission also constitutes the main orientation in choosing priority recommendations for public policies, and the mission test is the main determinant when introducing smart solutions and projects, which are intended for Kraków to pursue and build up a clever and adaptive city.

CONCEPT OF ADAPTIVE CITY

BUILDING STRATEGIES ALWAYS INVOLVES THE MAKING OF CHOICE

In order to choose what is to make a noticeable change in the whole system from an unlimited number of creative ideas you must have selection criteria and certain theoretical premises. First, the answer to the question whose city it is, and who will be the beneficiary of technological improvements.

In view of the above, should (can) the city be designed? Or should it change itself in harmony with our individual and group expectations? The starting point and the primary selection criterion according to the authors of SMART_KOM Strategy is the thesis that the city is mine-the city is ours. The city is changing in the right direction, if the quality of my life in the city is improving-in harmony with people, technique and city space.

The mission of smart city is designed as part of the project "SMART_KOM. Kraków in the network of smart cities "and saved in the" Roadmap for intelligent solutions in Kraków Metropolitan Area "defines the city, which we want to build as:

- a city which gives the residents the possibility of choice and shape the space for their personal development without losing the harmony of community;
- the city in which the technology serves the residents to solve their problems and provides an effective support for taking intelligent management decisions.

HOW TO TRANSLATE THE MISSION INTO ACTION PLAN AND IMPLEMENTATION PROGRAMS?

The primary intention is to provide the city and metropolitan region with such tools of new technologies (eg. ICT, ITeS), which will allow to increase the influence of citizens to shape the development of the city and the metropolis. It should serve the fulfilment of values as indicated in the mission, including:

- subjectivity of the citizen (the quality of individual life of citizens and family is the primary objective and the criterion of choice);
- subsidiarity of authority (the authority is only there where it is necessary to harmonise conflicting expectations, conflict resolution, providing standards and security);
- transparency of action and procedures.

The strategy and the action programmes which result from it must determine the directions and tools of implementation in two basic areas (domains):

- good planning and organizing the living space of residents (through the use of technology for the processes of democratic shaping of city space and municipal services);
- intelligent and integrated management of urban processes.

We can see a spontaneous implementation of new IT solutions, which make it easier for the residents to attend everyday affairs. Because of its intervention, spot nature, however, they do not form a sufficiently new quality of the whole urban system and do not always serve the fulfilment of the value of citizen`s subjectivity, transparency of procedures, and in particular they do not meet the criteria for the integration of processes. The result-oriented action plan is therefore necessary to integrate systems and minor improvements in order to have a new method of the functioning of the whole urban ecosystem created by the administration, services, local scientific communities and businessmen.

INTERACTIVE ADAPTIVE CITY

To identify the strategic direction set by the SMART_KOM project more clearly. Kraków in the network of smart cities ' and included in the SMART_K0M Strategy, it is necessary to indicate which selection was made by the authors of strategy among the possibilities offered by theorists of urban development.

We want to answer the question whether the city can or is to be designed? Or rather the question: how to do it effectively and in accordance with the will of the citizens? The answer to this question (although at first glance it might seem outside the context of the project) will allow us to show the long-term prospect of utilizing the technology to improve democratic processes, which means providing tools to effectively explore and harmonize the expectations of individual citizens, building and designing the city using methods compatible with the natural processes of spontaneous and "grassroots" urbanization.

Note the two phenomena, to which potentially available technologies today would give a new dimension close to the actual course of processes and the actual parts individual citizens and private investors play in the city.

Phenomenon 1: at a level of our daily activities, today we would be able to give to the authorities of the city and urban services much more signals about our needs and expectations, than is the case now. Instead of appealing in all cases to the mediation of representative bodies or referendums, we could allow the authorities to collect (within the privacy limits) the information about our expectations like commercial service providers or companies do it every day.

Phenomenon 2: the fact is that in spite of the so-called "planning power" is in the hands of urban authorities (municipal) the cities and towns are built (and have always been built) in the first place by small and big private investors, in accordance with their criteria of benefits. Without their investment, there would be no urbanization. Planning ("creative") influence of the city turns out to be often illusive and limited to an arbitrary decision and where and how not to build. Deeper knowledge of planners about the expectations of investors would help to better plan the city space and to trigger more synergy of economic development.

There are many proposals for urban planning theorists. There are extreme approaches to this issue, who is the founder of the city, who is his "engineer". Both extreme approaches do not correspond to the reality well, but they can be harmonized in a new way thanks to the technological solutions available today.

The first view is constituted by the following assumptions:

- the city is/should be the engineering product, holistically designed to effectively resolve the problems of residents;
- the will of the designer may be fulfilled in the scale of the city;
- the form of the city, its morphology, can be designed "in advance" being ahead of its development.

The second view, in turn, is that:

- the city does not solve the problems, the city is the environment, which allows or does not allow to solve an infinite number of small problems that people living in the city have;
- the morphology of the city is a product of autonomous growth processes and adaptation to the changing needs and possibilities of people;
- the city may not have effective designers of its future.

According to the authors of the strategy recorded in the "Roadmap", today, both of these contrasting approaches can be used harmoniously by building a vibrant effective city with decent living (resilient, agile, city with decent living):

- the social assumption, where the starting point, the basic value and objective is the quality of individual citizen, and the cities are be subject to the processes of spontaneous self-organization (emergence);
- is not in conflict with engineering activities: planning, design, optimization of urban systems.

It is possible, provided that we shall start and support with technology the functions of interactive:

- adaptive;
- city.

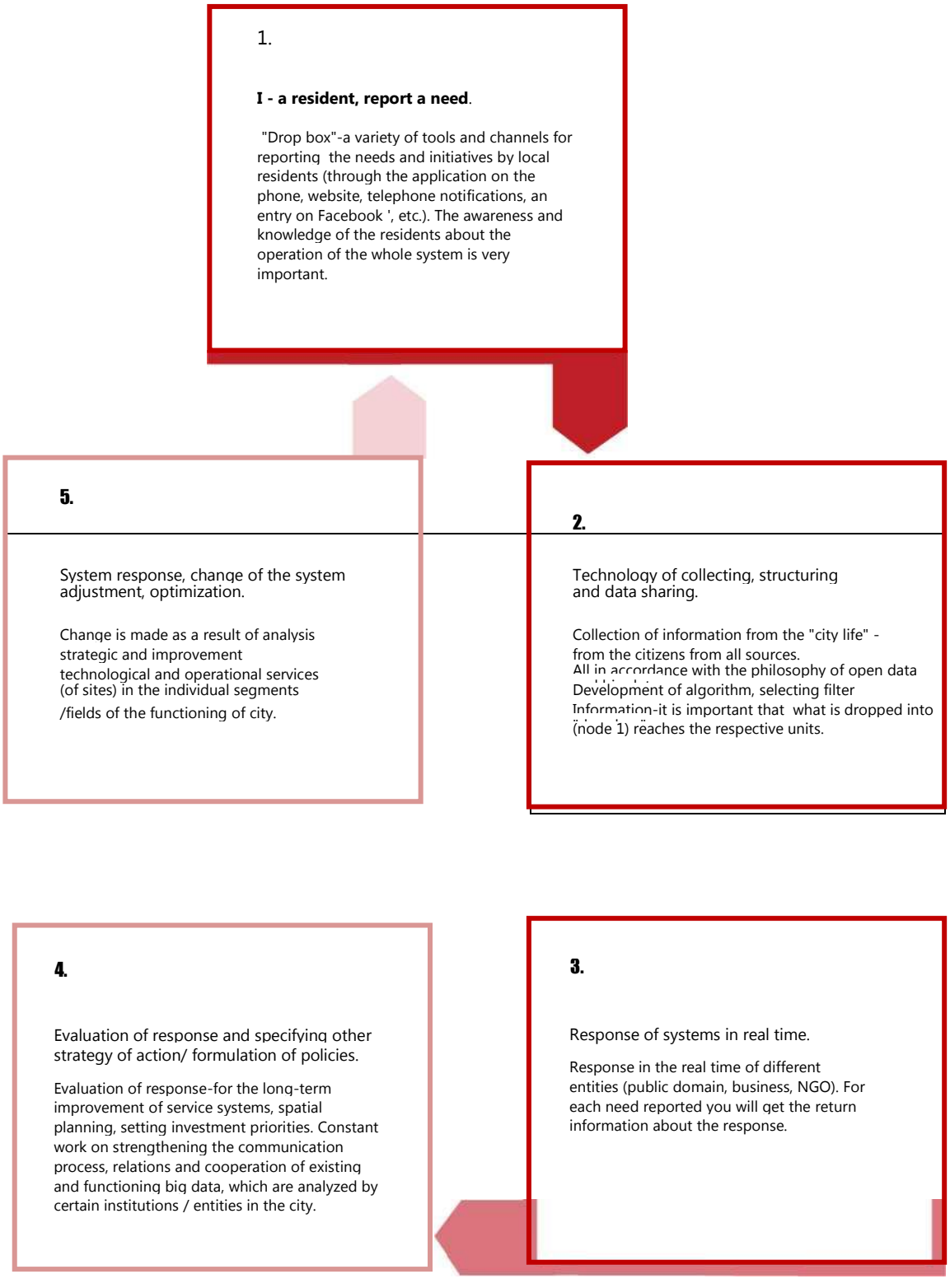
The interactive city is the one, in which citizens pass on to the administration, services, fellow citizens, experts, their applications with great ease (e.g. "hole in the road"), complaints ("there is no water in the tap"), expectations (such as: we want the bike lane along the street which is being rebuilt), and their applications do not disappear in the bin, but become matters that you can follow (like courier dispatches) and get the answer-positive or negative-with some justification. At the same time, these applications are registered in the spatial (GIS) databases and like other data they are used as the information for spatial planning and development of urban systems. The point is to build two-way communication channels not only between the citizen and the administration, but also between different administrations, services, businessmen, individual citizens and groups of citizens.

SMART CITY IS: A WISELY MANAGED ADAPTIVE CITY, THE SYSTEMS OF WHICH CONSTANTLY IMPROVE, HAVE THE ABILITY TO SELF-TRAINING AND SELF-IMPROVEMENT.

The interactive city is able to register in its digital databases of terabyte data the information generated daily in urban systems (transport, municipal economy, architecture and construction supervision, real estate economy) and use them to analyse the natural processes of urbanization, social phenomena, and to track the needs in the scope of municipal services, etc. The city becomes the adaptive city from interactive point of view, if the processes of the use of information gathered in the integrated databases for spatial and strategic planning, programming the activities, automatic improvement of urban service systems are launched.

THE FUNCTIONING OF ADAPTIVE CITY

The process of the functioning of adaptive city can be presented in the form of pentagon or model with five node points.



Node 1:

In the first "node" of pentagon, at the top of model, is a citizen (groups of citizens, businessmen), as a source of information about how the city should plan and improve processes. You can imagine citizen reports, for example, as an urban phone for reports (but also the website, application in the phone, and others), which provides not only a place to provide answers, but above all-similar to New York number 311[8] -is the source of information. This information is recorded in an orderly way in urban spatial databases (the second "node"-collection of data), used for ongoing decisions and long-term planning. The supplement of this output information is the knowledge about current phenomena, taken from the existing transport management systems, municipal management, building licences, management of real estate, health care, schools, kindergartens, etc.

Node 2:

In the second "node" you will find the technology and structuring (ordering) of collected data in such a way that they harmonise with the processes of different administrations and services . Civil reports and the collection of information about the so-called city life requires the connection of existing information and communications systems, which currently operate in the city, to a large extent independently of each other. This does not mean the connection of existing databases into one huge database, but IT link of existing scattered databases. It is therefore important that the computer systems built in Kraków and KOM are: spatial: (in GIS technology), integrable and open.
The openness of systems is to allow not only for the free exchange of data between specialized databases, but first of all for their wide availability, according to the paradigm of Open Data. In addition, in accordance with the principle of linked open data-that is, sets of data related to one another, it will be possible to facilitate data integration and provide the scattered public data linked so far. Database systems-referred to-in essence constitute a binding element of all "nodes" of the pentagon used to the current management, strategic and spatial analyses and the automation of improvement processes.

NODE 3:

In the third "node" of pentagon there are all current responses of administration services of entrepreneurs, released by citizens` reports or the information collected in databases. This may mean patching the holes in the road or the change of the location of streetcar stop, but also the opening of a new service (for example, service of transporting children to school by a private entrepreneur).

NODE 4:

In the fourth "node" of pentagon there are functions and tasks that are carried out today in the administrations of KOM by the municipal departments or sections of urban planning. In the event of interactive and adaptive city there is a possibility of using up-to-date information about the condition of the city and the citizens ' expectations almost in real time with a much more so-called density and news. It's as if there was a permanent state of referendum based on full information, commonly available to citizens in the same way as to different administrations and services.

NODE 5:

In the fifth "node" of pentagon, the medium-and long-term adaptation of systems to the needs and expectations as reflected in the information content of the data produced in the "loop" of pentagon takes place. This may be a change in the general plan, change of public transport system, administration reorganization or administrative procedures.

8 York City number 311 is the idea of the mayor of New York Michael Bloomberg- to provide a single emergency number, by means of which any citizen could easily contact the office on all matters.

The most important and innovative element of this approach is to give the appropriate rank to social consultations. Today, the consultation, for example, on general plan (the so-called. "lining") often reaches a limited number of people. It often becomes the subject of emotional campaigns, which do not use "reliable information". New technologies allow today a much broader access to knowledge on spatial development, public and private investment intentions, data about the state of environment and the quality of water, air, etc. The integration and "openness" of data will allow to manage to harmonise conflicting expectations of the citizens. in a more sensible way

MY QUALITY OF LIFE IN AN INTERACTIVE, ADAPTIVE CITY

How does the pentagon loop work from the perspective of a citizen? We can trace it on the example. Current situation: I must drive a child by car to school which is far away from home. Everyday stress is due to the fact that I know what awaits me: traffic jams, problems with finding a place to park, etc. Today I have a few ways to solve this problem and avoid stress:

- I can call a taxi;
- I put on the social portal the invitation to organize group transport of children by neighbours;
- I can report to the Municipal Transport Company the request to build a new public transport stop.

In the present situation, however, no information base which is widely available is created on the basis of my reports and requests, there is no long-term response from systems and their self-improvement.

Imagine that we have a system in which in the KOM area all needs for the transport of children to school in a different way than your own car are available to all persons potentially interested in the solution to this problem: taxi company, Municipal Transport Company, social groups, neighbours. In this case of open information, a permanent solution to this problem would probably be found [INTERACTIVITY]. For example, somebody would found a company specializing in transporting the children to schools in the center of the city from the Mogilany, Wieliczka or Zabierzowa, region and the Municipal Transport Company, would know, what are the actual transport needs and the needs related to the mobility of residents of QOM [ADAPTABILITY]. This is the link between information technology and processes of the city, and adaptive and interactive quality of my life in the city.

CONCEPT OF ADAPTIVE CITY

1, I-A RESIDENT REPORT A NEED

NY 311 -the idea of the former Mayor of New York Michael Bloomberg for create a single emergency number, through which any citizen could easily contact the Office on all matters. 311 number is the first line of contact for residents of the city, allowing you to make the basic problems related to the functioning of the city and allows contact with the authority in matters of "no alarm". As a result, the city has control over almost all of the problems the residents call.

Contact Centre Warsaw -19115 Warsaw is a platform for contact with all the residents, which uses various forms of communication such as phone, email, mobile application, chat and website to report cases by the residents. In this way, people can do the job of an official without leaving home.

2. TECHNOLOGY OF COLLECTING, ASTRUCTURING AND AVAILIBILITY OF DATA

Data in Warsaw style -the design of the capital city of Warsaw, which with the help of the Internet platform opens up public data with the support of the partnership of non-governmental organisations, private company and a University. The aim of the project is to collect data and make them available to the public in an open and uniform manner.

Amsterdam Open Data Handbook -a guide created in the framework of Amsterdam project ODE II (Open Data Exchange), which provides support for the process of opening the data and presents the best practices in the field of open data.

3. RESPONSE OF SYSTEMS IN REAL TIME.

Adopt a fire hydrant -the history of snow removal from street hydrants in Boston. Ploughs removing snow which fell on fire hydrants and "urban" ideas on snow removal were in the scale of the city very expensive. The problem was solved by 20 year old computer programmer who created the simple mobile applications, enabling the "adoption of" hydrant provided and giving it the name on the virtual map of the city in return for regular snow removal. The key to success was a built gravitation mechanism: fire hydrant from the snow was not removed may be a victim to a "hostile takeover", including the granting of a new name. Solution to the long-standing problem, which cost two weeks work of one person can save millions of dollars by giving joy to thousands of people. In recent years, the Boston application was adapted to many other contexts (e.g. notification system for tsunami in Hawaii).

Let`s drive our children to schools together -the idea of the residents of one of the districts of the village of Mogilany near Cracow, which was created out of the necessity to transport the children to schools. Residents noticed that every day from their surroundings, the children from about 150 homes are transported to the same 3 schools To improve this process and save your time, they decided to organize and create their own district system. Thanks to it, parents,, in accordance with the agreed schedule, would transport the children of other parents,, attending the same school at the same time, saving the time. Today, the system operates in accordance with the established graphic designer for parents, according to which, on average, once a week the transport of children to schools falls within a single household.

HOW WE BEGIN TO BUILD A SMART CITY, THAT IS, RECOMMENDATIONS FOR PUBLIC POLICIES

"A roadmap for intelligent solutions in the Kraków metropolitan area" is not a strategic document related to one particular institution. It performs the role of a signpost marking the trends of action or just specific solutions, which bring Kraków closer to the fulfilment of the idea of a smart city. It can be both a source of inspiration in the context of the development of the idea of a smart city, but it also may play the part of a set of recommendations thought out, adapted to the realities of Kraków and KOM, and projects described in detail, worth implementing by local self-government or non-governmental sector or business.

This support is carried out by indicating a set of recommendations to public policies, both at direction and detail level, and the presentation of a set of 24 projects worth implementation.

The starting point for the formulation of recommendations for public policies as part of the "Road map" was widely discussed in the public discourse, the concept of a smart city. . It is understood that it will consist of 6 areas *i.e., smart people, smart living, smart governance, smart economy, smart mobility and smart environment*. For the purposes of works on the "Road Map" the concept has been adapted to the specificity of Kraków and local conditions diagnosed during the first stage of the project SMART_KOM (challenges for the smart development of the city and KOM). The effect of this was the separation of 4 thematic areas around which further works were focused. The set below includes recommendations for public policies, which can be implemented in the immediate future, and those from which the changes for the development of Kraków and KOM towards a smart city should be designed. The order of specific recommendation is the result of an internal prioritization showing on the one hand the urgency of intervention in the areas concerned, and on the other its reality in terms of time, organization and finance.

Mobility and the environment in KOM	Participation and the quality of public space
Active, healthy and safe residents in KOM	The politics of information management in public institutions by opening the data

Within each of the areas, the so-called "interesting inspirations" were presented, that is, studies of cases worth mentioning of smart solutions already implemented in other countries, which should become a real inspiration for the institutions, entities and individuals who will be involved in the implementation of the "Road map for intelligent solutions in the Kraków Metropolitan Area." Inspired at least in two aspects. First of all these examples show how important for the effective pursuit of intelligent changes in the functioning of urban space is the precision of setting the objectives and indicators of outcome we strive for, which we decide on with regard to Kraków and KOM. Secondly, they allow to illustrate how in practice the recommendations and trends for public policies can be transferred and implemented indicated in the document. All the presented examples have been identified during studio visits as part of the project "SMART_KOM. Kraków in the network of smart cities ". More information on good examples presented can be found in the reports of studio visits, which are on the site of Kraków Technology Park (http://sse.krakow.pl/pl/smart-kom.html).

AREA: MOBILITY AND THE ENVIRONMENT IN KOM

Smart mobility *(smart mobility)* is a well-organized public transport, which is characterized by high transport accessibility and balancing of transport (alignment in the structure of travel apart from movements by one`s own car, participation of both public transport and bicycle transport or walking). Smart (smart environment) means the sustainable management of resources (water, energy, waste), care about the cleanliness of environment, as well as harmonizing spatial planning with regard to the role of green areas in the city and metropolitan area. The recognition of the common recommendation for mobility and the environment, is due to the fact of the interaction of these two areas and strategic diagnosis, which proves that the mobility has a direct impact on the quality of environment. Hence, the same area with regard to the environment in terms of a smart city, is built by two lines of recommended action: air quality (the desire to get as clean air) and transport (optimization of communication system).

Directional recommendation:
IMPROVEMENT OF THE QUALITY OF THE AIR IN KRAKÓW

Recommendations:

- implementation of "anti-smog resolutions "and low emission reduction programmes in Kraków and KOM; ;
- shaping the attitudes and lifestyle among the residents of KOM, in support of caring for air quality, for example. by promoting any action to encourage riding bikes, which contributes to reducing smog cloud in Kraków; promoting among the citizens of Kraków and KOM waste segregation and pro-ecological conscious conduct;
- ensuring full access to information on the opportunities of residents to participate in cleaning the air, for example. due to the popularization of trend to use network heat, gas heating, deep thermal insulation of buildings, using ecological transport;
- restricting the entry of cars which do not meet environmental standards to the centre of Kraków (keeping track of legislative processes at a national level – the current project assumes that JST will be able to designate zones of restricted car exhaust emissions, where cars which do not comply with the standards EuroA and Euro5 will not be able to enter.
- close centre of Kraków, supported by vehicles which do not emit flue gases (trams, electric car sharing-self-service rental of electric cars and e-freight-promoting clean urban transport of goods).

Directional recommendation:
CONDUCTING TRANSPORT POLICY IN AN INTEGRATED WAY

Recommendations:

- integrated management of mobility understood as the management of transport development based on e.g.. Agglomeration Council of Mobility comprising Kraków and the surrounding municipalities;
- cooperation of Kraków and the neighbouring municipalities for the integrated spatial planning, among others, it can prevent uncontrolled "flow" of Kraków on the neighbouring municipalities (controlled sub-urbanisation);
- designating the central area of Kraków protected from car transport, division of Kraków into zones of communication access, introduction and restriction of the rules as regards moving about Kraków by choosing individual transport with a simultaneous modernization and improvement of the quality and competitiveness of public transport offers.

Directional recommendation:

THE DEVELOPMENT OF SUSTAINABLE TRANSPORT, THAT IS THE PARTICIPATION IN THE STRUCTURE OF TRANSPORT OF BOTH PUBLIC TRANSPORT, BICYCLE TRANSPORT AND FOR PEDESTRIANS

Detailed recommendations:

- efficient involvement of residents in discussions on improving the relocation as part of the COM;
- integration of the means of transport: rail, bus and public transport, bicycles, pedestrian movement; location of change hubs outside Kraków.
- development of rail transport-3 lines of agglomeration rail, quick and comfortable reaching the rail transport in KOM, constant promotion of rail transport among the residents of KOM;
- location of parking spaces Ride &Park within the immediate surroundings of railway stations and also streetcar and bus terminals to enable fast and safe transfer to the public transport;
- restriction of parking spaces in the inner city-building new underground car parks shall be subject to acceptance by people, release of public space occupied so far by cars (sidewalks, roads) to new objectives, giving them over only for local residents ;
- reducing disparities between transport in the city of Kraków and the metropolitan area by improving the quality of public transport infrastructure in the area (standard in KOM).

INSPIRATION WITH STUDIO VISITS

Vienna-sustainable transport

One of the main areas of Vienna activity in the direction of a smart city is transport-the objective in 2025 is to achieve 80% share of the so-called "ecomobility" in transport (including bicycle transport, public transport and pedestrian). In 2012 this share was 73%.

Vienna-incineration plant

Spittelau is one of the four incineration plants operating in Vienna. Its rebuilding according to a design by the famous architect Friedensreich Hundertwasser made, that the building became almost a tourist attraction and one of the better-known silhouettes panoramas of the city. However, the most important is its environmental aspect-during the rebuilding of the power plant, the most modern filters preventing the penetration of harmful substances into the atmosphere were installed, and the intelligent system of supplying the incineration plant was introduced. Water is used to cool the system from the Danube (cleaned, it returns to the river cleaner than originally). Now in Vienna 90% of waste is processed. The heat during the incineration process heats the Viennese households, and the cool water is used e.g. in air conditioning of the local hospital.

AREA: PARTICIPATION AND THE QUALITY OF PUBLIC SPACE

The primary objective of SMART_KOM is to improve the quality of life of the residents and to increase their participation in decisions concerning important issues of the city and the metropolis. It is not possible without a good, functional public space and the possibility of the participation of citizens in taking important decisions related to the functioning of metropolis. It can not be done without the cooperation of all interested circles and without breaking the so-called "silos" in the management of the city. The primacy of thinking and general acting, exceeding sector attitude and the urban lifestyle and the related creation of urban space, where the basic urban services are carried out and where you spend your spare time, establish new social relationships, are extra dimensions of a smart city, to which the following recommendations were formulated.

Directional recommendation:

THE NEED TO CREATE AND SUPPORT CROSS-SECTORAL COOPERATION NBSM (SCIENCE - BUSINESS-SELF-GOVERNMENT -RESIDENTS) FOR THE DEVELOPMENT OF THE CITY WITH EFFECTIVE USE OF NGO ORGANIZATION AND GROUPS OF RESIDENTS

Recommendations:

- overcoming the thinking and sectoral acting in favour of a holistic attitude to cooperation also at a level between sectors
- strengthening local government cooperation-residents (represented by local leaders and NGO) extension of contracting of public services in areas where local communities and NGO are most active and most importantly effective.
- intensification of cooperation of self-government with local businessmen (public-private partnership) in solving urban and metropolitan problems, with the participation of residents and representatives of the scientific centre of Kraków;
- intensification of cooperation of self-governments within KOM-especially in the Association of Metropolis of Kraków

Directional recommendation:

WIDESPREAD APPLICATION OF THE RULES OF DELIBERATE PARTICIPATION

Detailed recommendations:

- developing a standard and a system of social and civic education to the residents of KOM, creating and implementing educational programmes based on interactive virtual and region techniques in urban space (e.g. town games, "quests"), the promotion of modern civic education in local institutions (schools, community centres) and educational initiatives of (III) sector;
- developing social consultation procedures and participation on the basis of:
  - universality-effective reaching of residents with the information;
  - conclusions -return information system (what effect of consultations what final solution was adopted and why, making results public);
  - participation of residents at each stage of works - from design and concept to completion (residents take a common decision as regards the city they would like to have, and they do not consult ready plans);
  - involvement and inclusion of actors of influence and local communities in the process of public consultation and participation;
- creation of urban space of public consultations and works on the strategy of development: meeting places and interactive presentation of the development plans of the city (the model > Vienna 2025);
- application of techniques using spatial information both in electronic form (GIS including Public Participation GIS) and analog one-work with a map/ mental map, design workshop/type of charrette;
- creation of standards of investment processes to build a framework for the arrangements of the interests of residents, as a social party and the investor`s.

- development of the idea of civil budget and, in particular, its educational function, so that a more numerous group of residents take part in the creation of local projects. Further gradual increase of budget allocation.

Directional recommendation:
IDENTIFICATION OF THE POTENTIAL OF EXISTING PUBLIC SPACES (DEVELOPED AND UNDEVELOPED) AND GIVING THEM THE ACTUAL VALUE FOR THE FULL SOCIAL USE

Detailed recommendations:
- building awareness that the public space constitutes first of all whole strings/grids of streets; abandoning the thinking only in terms of point in favour of the network of public space;
- developing the system of incentives for owners and administrators to share the space for public purposes within a specified time, for example. monastic gardens, garden plots, the spaces between the buildings in the centre of the city (making use of existing, neglected public spaces to have a new function for example, places for lunch); giving new functions to undeveloped public spaces, surrounded by blocks of flats;
- intensification of green management through intelligent solutions in a small scale: green roofs, green facades and creepers, enrichment of biodiversity and the functionality of the existing small, neglected areas (projects of micro-parks and greenery gardens in residential developments);
- creating a system of "green corridors" connecting urban recreation areas friendly for pedestrians (including those with limited mobility, such as families with prams) and cyclists, in-line skaters, etc. green corridors should ensure a high standard of safety, greenery, and acoustics;
- inclusion in the design process transport infrastructure of people responsible for the aesthetics of the public space and greenery;
- education of residents concerning the green areas in public space, including the use of the concept of "ecosystem services", that is, any benefits derived from the environment by households, communities and businessmen.

Directional recommendation:
THE RESIDENT OF KOM SHOULD WITHIIN 3-4 KM FULFILL MOST OF HIS PUBLIC NEEDS

Detailed recommendations:
- coordination of local revitalization processes through social organizations (Association) established by public, social and economic entities, in cooperation with the municipality of Kraków;
- institutional support for the local economy (mainly MSP sector)-mainly innovative enterprises through the creation and implementation of the system of incentives and initiating legal, financial and technological assistance;
- developing the program of building up the image of Kraków as the most important Polish hub start-ups and technological entrepreneurship: grants for events of start-up scene with international reach, co-working of the "first contact" (meetings and the first weeks of the action of teams and soft-landing), support for the promotion of Kraków and capital funds operating in Kraków in Eastern Europe, taking into account the brand in business promotion.
- development of public services on site (in the context of the creation of public services available in places which are natural centres for the districts of Kraków).

INSPIRATION FROM THE STUDIO VISITS

Helsinki, Arabianranta District- arts district and design

Arabianranta is a wonderful example of providing residents with a high standard of living and quality of life through sustainable land development (playgrounds, walking and recreation places, common gardens, single works of art in the landscape showing the pulse of city life and changing architectural space). Modern buildings in Arabianranta were built on the principle of combining technique with a good design, according to it 1-2% of the cost of construction was spent on art. It is a district of art and design. The artist Johann Hyrkas designed the art trail, which connects buildings and gardens of art in common useful landscape. Arabianranta is home to 10,000 people, jobs for 5,000 and 6,000 students of campus and the know-how specialists gathered around 6 educational institutes. The structure of buildings varies: from residential blocks of flats through the lofts to the Villa. It is worth mentioning that there are homes for groups with special needs, such as Loppukiri (a residential community for active elderly people), Kapytikka (mansion for the mentally disabled minors) and MS-Talo (MS House-for people with MS). The district of Arabianranta created the so-called "living laboratory", and since 2007 it has started testing services and products with the name "Helsinki Living Lab" together with the residents. Apart from the local computer network, one of the most important services for the residents is the website of Building Society, which is updated by the moderator. Moreover, educational institutions and students can use a common platform of contacts in their own research projects, one of the examples is the design of the Helsinki Living Lab, sponsored by TEKES.

Vienna-STEP 2025

The development plan of the city 2025 (STEP 2025) for Vienna specifying short-and long-term directions of the development of city for the next ten years. It is based on ideas, principles and objectives of framework strategy of a smart city. The basis during the development of STEP is participation, taking into account different situations of men and women during planning, sustainable development and diversity. They are intended as an obvious principles, both in the case of the methods of action as well as their implementation. On the basis of the STEP 2025 concepts were developed and activities such as: concept for green areas and undeveloped areas; concept for skyscrapers; the concept of mobility were started.

AREA: ACTIVE, HEALTHY AND SAFE residents IN KOM

Another thematic area is focused on the issue of health prevention (prevention programs, education, promotion of healthy lifestyle, encouraging physical activity and healthy eating), politics, senior policy and silver economy (prolonging life and social activity of elderly people, adaptation of services and the quality of the public space to the needs of the elderly), safety and protection of privacy.

Directional recommendation:

CREATING CONDITIONS FOR THE EXTENSION OF THE LIFE ACTIVITY OF SENIOR CITIZENS IN THEIR NATURAL ENVIRONMENTS

Detailed recommendations:

- improvement of the flow of information between the entities rendering services to seniors, supporting the cooperation between them and coordination of cause for seniors; dissemination of information on the safe and proven services for seniors (such as repairs, cleaning, cooking, care, transport);
- encouraging seniors to "leaving their homes," implementation of the system of vouchers. among other things, for the hairdresser/barber, beautician, dentist, a visit in the café, e.g. coffee for PLN 1 (implementation by integrated KOM Card;
- providing transport offer for the elderly-to and from the store/pharmacy/health centre-for example, vouchers for taxis, well arranged stops of public transport, telebus;
- involvement of business environment for the management of life wisdom and experience of seniors-professional activity in different forms;
- designing public space for the needs of seniors-friendly city is a city designed for the elderly people in their 80s-"rule 8/80" for example. public toilets, rest areas (the place where you can sit down, drink water, cool yourself in summer, warm yourself in winter), asylum for pedestrians, rolling stock of public transport, etc.;
- conducting the policy for elderly people in a balanced way so that, as a result of "silos" of action, the environment of senior groups is not transformed into social exclusion;
- diagnosis in spatial dimension, where the elderly people live in KOM, what their needs and constraints in the immediate vicinity are, and what kind of help they expect;
- support of intergeneration integration, volunteering of seniors and social economy activities;
- gradual abandonment of large care centres (behemoths designed for several dozens of persons) to extend their stay in their own homes (help in adapting flats to meet the needs of seniors — architecture and sensory technologies, telecare, taking care of senior citizens in their homes), eventually build small, intimate houses most reminiscent of a traditional house (you may refer in this respect to German solutions).

Directional recommendation:

INTEGRATION AND PROMOTION OF EFFORTS TO IMPROVE THE HEALTH AND PHYSICAL CONDITION OF KOM INHABITANTS

Detailed recommendations:

- integration of prevention programmes carried out by various entities-strengthening cooperation on the offer of preventive health care;
- improvement of the flow and availability of information about the health prevention in the KOM area - information provided in a transparent manner, constantly updated and integrated from a variety of sources (JST, NGO, NFZ, commercial entities);
- intensification of efforts to combat the bad eating habits in children and adolescents-encouraging physical activity (for example, using competition games).

Directional recommendation:

IMPROVEMENT OF THE SENSE OF SECURITY IN PUBLIC SPACE AND IN THE WORLD OF "INTERNET"

Detailed recommendations:

- extension of preventive and educational action in the scope of information about dangers of internet network-protection against cybercrimes and cyber bullying;
- shaping the attitudes of responsibility for safe public space-system integration

of CCTV effective monitoring and removing manifestations of vandalism including illegal graffiti;
• using the services of Fire Brigade to a larger extent as entities supporting the residents, especially seniors.

INSPIRATION FROM THE STUDIO VISITS

Helsinki, Living Labs Network

Laurea Living Labs NetWork is a member of ENoLL (European Network of Living Labs). The initiative to use the students as end users of innovative products and services, which you can then employ in the following phases of design and implementation. Interest areas include: life science, education, regional development, e-health, active ageing, quality of life.

Barcelona "Trust Network"

In Barcelona a network based on cooperation in the service of the elderly was established, one out of five residents of Barcelona is more than 65, and until 2040, this value will reach one out of four residents. As far as life expectancy is concerned-what is happening in many cities around the world-new health problems appear and the social isolation deepens. To deal with this growing problem, Barcelona uses low-tech digital strategy to create a network of family members, friends, neighbours, social workers of social care and volunteers who will create a "support network" for each of older resident exposed to these risks. It helps to identify the areas in which care provided is not satisfactory, and also allows the coordination of support and promotion of a better quality of life.

AREA: INFORMATION MANAGEMENT POLICIES IN PUBLIC INSTITUTIONS BY OPENING DATA

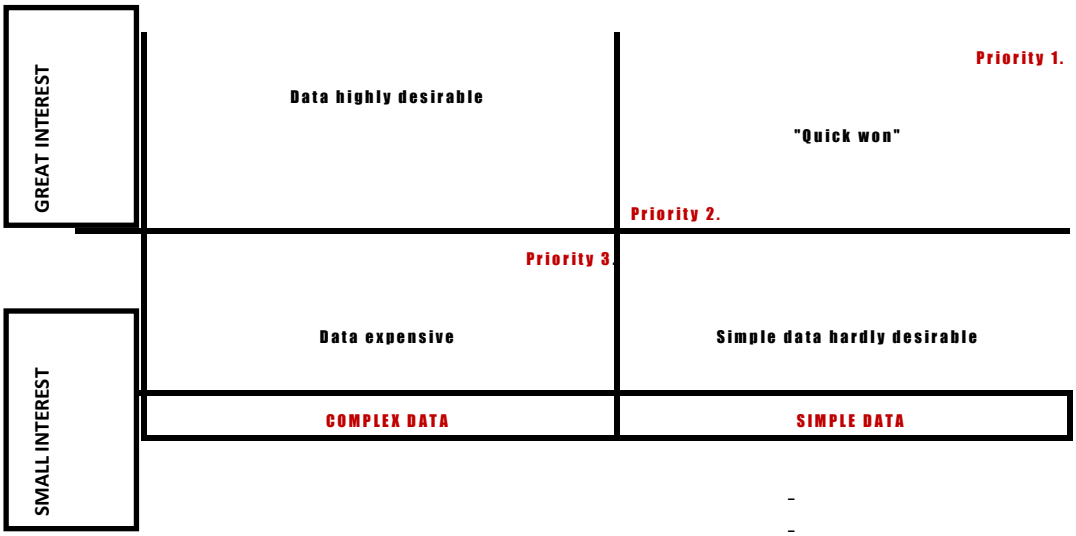
The basis for building an effective smart city is leaving the paradigm of the secrecy of activities, documents and information which is created by the Administration, in favour of the idea of openness and availability of resources and procedures for its operation. This area focuses mainly on issues relating to building open data resources and big date for the new concept of the development of the city of Kraków along with the surrounding metropolitan area. This involves the need to ensure greater efficiency in providing public services in accordance with the concept of lean management and designing public e-services user-oriented (user experience), to highlight the importance of the involvement in the process of functioning and creating a public space of the city, of all residents. Two major directional recommendations were identified as part of workshop works.

Directional recommendation:

CHANGING THE APPROACH TO INFORMATION MANAGEMENT POLICIES IN PUBLIC INSTITUTIONS BY OPENING DATA

Detailed recommendations:

- appointing in the self-government units and public institutions as part of KOM agents in charge of information management (based on the model of Chief Information Officer-CIO), persons or sections responsible for information management, with implementation capacity, the ability to design administrative procedures and strongly fixed at a level of a particular office or institution. In addition, the support of team consisting of people selected from various departments, which administer information resources.
- building up the agreement between key institutions and entities operating in the area of KOM, for broader coordination and cooperation of all units included in building a unified system of public information about the city and KOM;
- organizing and unifying information systems at the offices of municipalities and their subsidiaries, and posting on websites by public institutions file formats conforming to the principle of technology neutrality, i.e. such which are not subject to any patents or licenses, and their full documentation is publicly available and they are recognized by the international standard body odt., html. Organizing the information system in the GCM and subsidiaries-in accordance with the Resolution of the Office of the City of Kraków, which defines the concept of open data formats.
- preparation of public institutions and subsidiaries companies (provincial and municipal) to the pilot process of availability, data which are at their disposal in the open form, and after its implementation the development of a long-term strategy for sharing data, for the purpose of reformulating work of offices to use open data formats, sharing the sets collected and the creation of new tools and information systems. The process of opening the data must be made according to the following scheme:
  - development of a pilot plan to open data in the City Office of Kraków with its selected subsidiaries, Malopolski Province Office and the Marshal Office of Malopolska Region along with provincial organizational units;
  - inventory and categorization of information resources, taking into account the restrictions on the admissibility, structure or format of data;
  - developing a security policy, privacy policy, rules of certification and data licensing rules;
  - specifying the formats and standards for data for the stock counted;
  - studying the demand for specific data among business circles (in particular among start-ups), NGO and scientific institutions. The determinant is a chance for the creation of socially useful application and activation of business;
  - prioritization of data. Inventoried data should be sorted out on the chart the y-axis of which specifies the "Data, whose opening is of small interest" and "Data whose opening is of great interest," in turn, the X-axis specifies the "Complex, difficult to open data" and "Simple, easy-to-open data". Data which are of great interest and are simple, easy to open must be available in the first place. Thanks to this operation it will be possible to assess quickly whether such a change of approach to information management policy would be desirable;



- taking into account in the process of opening the question of Big Data by opening data resources related to each other, which can and will create a new value necessary for more efficient city management in conjunction with KOM;
- choosing a place to share data depends on the data type. For example, the appearance of website similar to danepowarszawsku.pl portal page, but also sharing the data on the websites of institutions or companies;
- promoting the idea of openness: supporting and encouraging the administration at local, regional and central level to implement the ideas and principles of open data; change of the consciousness of residents, officials and users about the benefits of the opening of the data, the possibility of a real impact on the city policy conducted, and the quality of services provided in the city;

- appointment of a panel of experts consisting of representatives of various institutions (UMK, urban management, organization and executive agencies, and city foundations, MUW, UMWM, GUS, universities, chambers of commerce) with a strong support on the part of the various authorities. The team's task will be to develop a detailed plan for the opening of data and to generate know-how in this area, the exchange of information and good examples. An important role of this team should also be the influence they exert on their organizations in order to change the approach to information management policy and to motivate them to be involved in these processes.
- the use of in the process of opening an Urban System of Space Information (need to increase automation in sharing and collecting data by the system and its further development);
- the use of open source tools in the process of opening the data, in particular by using the CKAN platform (The Comprehensive Knowledge Archive NetWork), which is the open Web based system for the storage and distribution of data, such as databases or spreadsheets;

- the application of standards of saving files that contain metadata enabling the automation of the use of Open Data (e.g. xml, svg);
- coordination of activities related to the opening of data with the preparation related to the organization of the World Youth Days, which will be held between 26-31 July, 2016. Thanks to the prior release of the data, for which there will be demand during the WORLD YOUTH DAYS there is a good chance that there will be socially useful applications, which will affect the safety and better organization of this event (e.g. making bus timetables available, which are now in the possession of the Office of the Marshal of the Malopolska Region and others);
- supporting local start-ups by supplying them with specific open data. The creation of adequate records in resolutions/regulations within individual self-government units and institutions, thanks to which it will be possible to create, start-ups by individual authors and other external entities of products and services based on the access to local data. The model here may be Decision No. CXXI/1976/14 of the Council of the City of Kraków, of 5 November 2014, about the trends of activities for the President of the City of Kraków about the conduct of urban open data policy.
- conducting an active policy of the city and local governments in the area of KOM in the field of taking into account and securing technological channels for future optic-fiber networks when implementing line investments.

Directional recommendation:

CHANGING THE APPROACH AS REGARDS THE PROVISION OF SERVICES BY PUBLIC INSTITUTIONS THROUGH GREATER ADAPTIVITY OF PUBLIC SERVICES AND ADMINISTRATION

Detailed recommendations:

- improvement of the forms in the city by creating the platform of communication of residents with the city (the point of communication with the residents), which has such interfaces as: phone (in-integration of all city hotlines in one place), self-service portal website with the wholesale business information and the form of problem reporting, mobile applications, "windows" in the office through which there would be the opportunity of interference, a free application, assessment of the work of units and obtaining the information. A good, inspiring example is the model of Warsaw and creating a single number 19115 and establishing the Department in charge of Contacts with the Residents.

  In Warsaw, the establishment of a new department was not associated with an increased number of full-time jobs in the city, only the transfer of all these people from all units, which so far had contacts with the residents. The creation of a platform of communication could take place according to scheme:
  - the establishment of the coordinating team and carrying out the project work;
  - the development of specifications, the announcement of procedure, selection by contractor;
  - developing a common standard of information card and standardisation of data, with the participation of municipal units;
  - Making the portal by the contractor;
  - pilot project to check the operation of system;
  - final launch of system (principles of functioning: 80% of reports auto-cataloguing, 20% of more complex reports, difficult to analyse by persons operating the system).

- increasing the adaptivity of public services and administration adapted to the needs and capabilities of residents-creating user-oriented electronic services, allowing to obtain a high level of satisfaction (optimizing the user experience).

  The recommendation applies in particular to the application of UX techniques (User Experience) to create user-oriented electronic services. An example that shows the problem are electronic services, which the offices provide on ePUAP platform (Electronic public administration service platform) and links to them on their sites of Public Information Bulletin. Descriptions of these services do not describe in a simple way how to arrange electronic matter, or if it is possible at all. Moreover, you can also identify a problem by

the repetition of error of electronics of the process of "paper" found rather than designing electronic services. As a result, we have the equivalent of an electronic paper-based services instead of fully dimensional e-service.

- simplification and popularization among residents of public services currently provided in the form of electronic forms on ePUAP. It is therefore justified to select a few public services already available electronically, for which there is a large demand and their simplification.
- the popularization of electronic services among residents/businesses, through the implementation of an information campaign, which will present the advantages of arranging matters by electronic means, in particular, it will reduce the time of providing the service.
- mapping and simplifying the processes in offices from the point of their implementation in electronic form-creating services on the line office-office, increase in exchange of documents between the administration (for example,. UMK, UMWM, MUW) based on ePUAP, in order to reduce administration costs, and improvement of administrative processes (electronic circulation of documents integrated with discipline systems by service rails, allows for greater automation of activities and generates specific savings).
- creating the Card of KOM Resident, which is at the same time the centre of client authorization. Resident card COM would be a digital document of person belonging to Kraków Urban Area. All those who will want to be regarded as the residents of KOM can have the card, that is, also a group of students or regular guests. KOM resident card would be used as follows:
  - carrier of agglomeration tickets in collective transport-both public and private (season tickets of MPK, agglomeration railway,, private businesses associated in the system);
  -Digital parking card within the metropolitan area;
  -a document certifying possible reductions and discounts offered by institutions of culture, education or commercial enterprises;
  -non-medical patient data card in both the CDC and the NZOZ (no sensitive data);
  -specific key to access data necessary for handling administrative affair as part of KOM.

In order that the COM Card of Resident could perform these functions a number of conditions must be satisfied:

- public authorities must be equipped with interfaces and software to enable citizens to use the card. This involves a one-off expense of implementation a cycle maintenance cost
- the offices must be capable of sharing data of the residents from the bases at their disposal. Therefore a system of associating the information supporting the card should be created, available in compatible formats to administrative units from the KOM area;
- the card should be protected in some functions with individual code or the production of national identity card in its current form.

INSPIRATION FROM THE STUDIO VISITS

Helsinki Infoshare Region

Website platform, which allows access to open data, allows you to submit the demand for them by users, and presents practical applications. Helsinki Region Infoshare is a joint initiative of the city of Helsinki, Espoo, Vantaa and Kauniainen (more than 1 million of population), supported by the Department of Information of the Office of the City of Helsinki and Forum Virium Helsinki. In the years 2010-2012 the pilot phase was performed, 2013 is the year of receiving the data, since 2014 the project of data sharing as a standard service. The Department cooperates with universities and other institutions to carry out research and publishes reports. It has access to public records on citizens' personal data. The institution has implemented the electronic circulation of documents, currently it does not create paper documents, all administrative decisions, notes from are in electronic versions. Helsinki Region Infoshare have currently more than 1000 data sets, open presentation of application data, platform for transmitting and collecting public opinion, worked out instructions for public agencies concerning the method of opening data and advice for programmers and users of other data.

Tallinn-Enterprise Estonia a-Showroom

Founded in 2000, Enterprise Estonia has been promoting the country's economics. 99% of bank transfers in Estonia are carried out electronically, 95% of direct tax declarations submitted by e-Tax system, 31% of the electorate voted through Internet in the elections in 2014. Through the Internet you can start business (it takes 30 minutes), order on-line at the doctor`s and buy medicines on prescription online in the pharmacy, participate in various civil projects, loyalty programs of commercial network and service establishments, etc.

All these operations and many others are possible thanks to the electronic cards of identity (ID Cards) which have two elements: citizen`s ID and his digital signature fully equivalent to the usual signature (eID). In addition, citizens can still use Mobile-ID (mID), to carry out transactions that require authentication or authorization by using a mobile phone or tablet.

In addition, Tallinn is committed to complete transition to electronic administration, eliminating paper document circulation and allowing you to arrange all matters electronically. In this respect, it cooperates closely with business (telephone companies, computer companies, banks) and also, which is very important cares about common education and promotion in this respect (schools, universities, media), it will enable the coordination of support and promotion of a better quality of life.

In this section, "Road maps for smart solutions in the Kraków Metropolitan Area" we focus on project proposals developed by participants of workshops organized as part of the stage III of the project "SMART_KOM. Kraków in the smart network of cities "or" Road map ".

Projects

The fragment of development begins with the presentation of criteria the projects aspiring to become "smart" should meet. These criteria were helpful not only in constructing the projects which were presented in the "Road map", but they are also a set of guidelines for the future for potential project developers who want to pursue the project for "city with common sense". The second part of this chapter is the presentation of the structure of the project card. Its design and descriptions of each position are a reflection of the criteria, and they also allow for initial familiarization with the idea of the project, 56 conditions of implementation, estimated the budget and the schedule of implementation. Full details of the projects are available in the electronic version on the site **www.kpt.krakow.pl**

It should be noted that the proposals presented in the document is the Open Catalogue of Ideas. The elements which in the future will allow the development of one`s own copyright project which will be part of the implementation of assumptions of the' Road map of KOM " are presented on purpose. At this level of strategy it is also shown how the individual initially described projects reported earlier, are positioned in the model of adaptive city and what the future awaits them-who, when and with what funding may undertake the implementation of projects reported.
The last theme emphasized in part III, is to present the assumptions of the model of communication of SMART_KOM Strategy contained in the "Road map for intelligent solutions in the Cracow Metropolita6n Area. "

CRITERIA FOR PROJECTS

The construction of the "Road map" is based on two main pillars, which is the mission of development in Ashridge model and the concept of the adaptive city. Nevertheless, bearing in mind that the "Road map" is a document that sets out development trends for KOM, the development in which all users of the KOM space (Open Catalogue of Projects) are to participate, it was decided that eventual projects which will register in the idea of a smart city should have a common denominator. In the course of the workshop works prior to the development of preliminary proposals of projects proposed for implementation, a catalogue of criteria was developed, smart projects should meet.

These criteria are to uphold the developed assumptions of smart city and metropolitan area. To help in the analysis of whether the specifics of the project has a "smart" element, or if it is a project -perhaps needed and desired, but possible to be implemented as part of the implementation of the "standard" activities of public administration and of the overall strategy for the development of Kraków or other municipality which is part of KOM.

Both projects worked out and recorded in the "Road map", as well as those which in the future will aspire to be implemented as part of the implementation of the idea of smart in Kraków and KOM, they must meet four of the following criteria:

1. Test of mission-checking whether the project is not contrary to the purpose, values, standards and falls within at least one domain of the mission, which at the same time influences other elements of mission.

2. Environmental criterion-checking whether the project does not burden the environment, projects scored with positive or neutral impact on the environment. Negative impact eliminates the project.

3. Criterion of reality-checking whether the implementation of project is viable economically and financially.

4. Test of adaptive city/KOM-verification of the answers to the questions whether the proposed solution:

a) improves the degree of informing citizens in matters of the city and two-way communication with the citizen;
b) allows you to collect data in the integrated, open (for different users) digital databases;
c) improves the quality of the process of preparing and taking decisions on the basis of a sufficiently rich, updated and accurate information;
d) improves universality, scope and effectiveness of public participation and consultation prepared by the administration of solutions (e.g. investment projects, general plans, etc.).
e) allows a permanent improvement of the quality of city services.

Requirement for the recognition of project compatible with the assumptions of the "Road map" is the fulfilment of all the above criteria, and in the case of criterion 4. Test of adaptive city/KOM, the project must meet at least one of the subpoints. For example, when evaluating or selecting a number of projects similar to each other, "more smart" will be the project that not only meets mandatory criteria, but also at a level of criterion 4 obtained a greater number of points.

In addition, a catalogue of detailed criteria was developed. They are to help in the selection of projects most similar to the idea of smart city. Thanks to this it will be possible to prioritise reported projects. For the fulfilment of each of the following criteria you can get from 1 to 3 points, depending on the complexity of the criterion. Moreover, detailed criteria are not an obligatory condition. However, the more points a project will receive at a level of detailed criteria, it is more akin to the idea of "smart". Detailed criteria include:

1. **the criterion for resolving social problems** (to what extent the project contributes to the solution of social problem, what is the importance of this problem, what is the degree of urgency of intervention in this area?);
2. **geographical/territorial criterion** (bonus projects including the biggest area possible KOM);
3. **environmental criterion**(bonus projects, the implementation of which will yield positive effects on the environment in KOM);
4. **criterion of deliberate participation**(bonus projects effectively and widely including residents in their implementation at each stage);
5. **criterion of efficiency** (bonus projects cheaper than alternative solutions or those whose value of effect exceeds or balances the costs);
6. **criterion of durability** (bonus projects, which can operate after completion of financing regardless of the presence of public subsidies or other ad hoc or extraordinary solutions);
7. **criterion of the expansion of information resources about the Metropolis of Kraków** (bonus projects that provide new data to the integrated databases created KOM;
8. **criterion of "interdependency"** (bonus projects relating to two or more areas of smart city. *smart mobility, smart environment, smart living, smart people, smart eco-Axel, smart governance)*

PROJECT CARD

Both the projects presented in the "Road map" , and those reported for the implementation in the future do not need to meet all the criteria. The essence of detailed criteria is to assist in the selection and giving bonus to projects , which passed mandatory criteria and, in addition, they comply with the additional criteria as much as possible.

The result of the above items, verifying the concept of smart city in the reported projects is the structure of their description, that is, project card .[9]. It refers directly to the outlined criteria, to enable their substantive assessment. Projects developed as part of works on the strategy of SMART_K0M and recorded in the "Road map" include in the description:

1. Project title
2. Entity responsible for the implementation and coordination of project.
3. The problem, the project corresponds to.
4. The degree of implementation by the project of four element mission of the SMART_KOM Strategy.
5. Description of the product and description of main activities.
6. Time for the implementation of project
7. Resources necessary for the implementation of project/project implementation conditions (legal, financial, technical, staff, organizational and management).
8. Impact
9. Target group.
10. Partners
11. Estimated costs of project.
12. Analysis of barriers and risks.
13. Sustainability of the project.
14. Indication of the possibilities of the multiplication of project.

PLACEMENT OF PROJECTS IN THE NODES OF "PENTAGON"

The following set of 24 projects provides a brief description of ideas possible for the implementation of pursuing the idea of a smart city, possible for financial support. as part of the Malopolska Regional Operational Programme (including those as part of the integrated Territorial Investment), Operational Program Intelligent Development, Horizon 2020 and others. Full descriptions of the projects in the form of large-scale cards of projects can be found in annex of this document, which in electronic version is available on the website **www.kpt.krakow.pl .** It is worth noting what has already been emphasized earlier, that the set of projects below is not a closed set -it is only a starting proposal, resulting directly from the most important challenges facing Kraków and KOM in the implementation of the idea of a smart city. Each of the projects presented is consistent with the mission of the development of a smart city of Kraków and KOM and fits in with the concept of adaptive city, at least in one of the 5 nodes of "pentagon" model, which was illustrated using an appropriate graphics in the upper-left corner of the description of each of the projects.
In addition, the degree of filling in individual items in project card[10] is different depending on the proposed solutions. This is due to the fact that at the stage of works on the project cards it has not always been possible to clarify specific questions, hence these proposals (in some cases)they are open, allowing extra supplements.
We hope that there will be entities willing to be involved in this type of projects, and the following

9 Matrix project cards is located in an annex to the "Road map for intelligent solutions in the Kraków Metropolitan Area", which in the electronic version is available on the website www.kpt.krakow.pl .
10 Full project cards are located in the annex to the "Road map for intelligent solutions in the Kraków Metropolitan Area", which in the electronic version is available on the website www.kpt.krakow.pl .

proposals, which have been created as tools to improve the quality of life of the residents of KOM will be used to build a smart city with the help of proposed solutions in the catalogue of smart solutions.

AREA: MOBILITY AND THE ENVIRONMENT IN KOM

PROJECT TITLE
Establishing the Agglomeration Council of Mobility

ENTITY RECOMMENDED FOR IMPLEMENTATION
The Association Kraków Metropolis

Short description of project
The Agglomeration Council of Mobility (ARM) is a forum for coordinating the implementation of transport policies, including the implementation of investments as part of ZIT strategy. ARM would play the part of expert forum to analyse the ideas and develop optimal solutions for the area of the whole KOM (and not for individual municipalities). ARM would include only public entities and their units, which in their respective areas of competence and budget have the tasks related to the creation and maintenance of public transport systems. Meetings will be held in the quarterly cycle.

It is suggested that the composition of the project team in charge of the establishment of the ARM will include the representatives (decision-making level) of the following entities: the municipalities that make up the Association Kraków Metropolis, Marshal Office of Malopolska Region, Polish Railway Company counties, Kraków-Balice Airport.

PROJECT TITLE
SMART_BUS

ENTITY RECOMMENDED TO IMPLEMENT
The Board of Municipal Infrastructure and transport (ZIKiT)/Operator

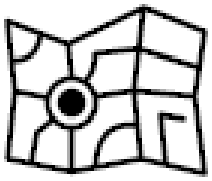
SHORT DESCRIPTION OF PROJECT
Creating smart, but at the same time functional vehicle-a typical city bus as a mobile station monitoring many issues: from the analysis of travel, through monitoring traffic to monitoring air quality. It is assumed that, for example vehicle will be equipped with GPS + digital connection (ZIKiT/on-line operator can connect to the bus, the bus sends data in real time); runs every day/variably on a different route; equipped with a front cameras

research of the residents-a form of survey, information desk-what is happening in the city; possibility to download municipal applications-on the bus-on a hot spot basis.
SMART_BUS is also an interesting idea to make the SMART_KOM Strategy real-on the basis of the visible, media, modern, but also fully useful effect of strategy.

The project will allow to better manage public transport, promote the smart idea, measure the behavior of people in real time.

PROJECT TITLE
Map of Agglomeration Bus Transport KOM

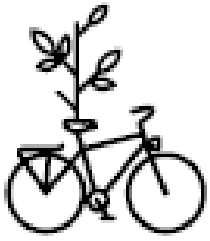
ENTITY RECOMMENDED TO IMPLEMENT
The Board of Municipal Infrastructure and Transport (ZIKiT) together with MobilityHUB (Kraków University of Technology)



SHORT DESCRIPTION OF PROJECT
The aim of the project is to carry out an inventory of all private bus lines (buses), operating in the area of KOM agglomeration and to visualize and map routes in terms of agglomeration. As part of the project it is assumed that in the first place, the acquisition of data about routes and departure times of private carriers from Marshal's Office and ZIKiT successive incorporation of data about the routes of carriers on the vector map, then the aggregation of a similar course of routes, common sections of different lines and determining the average frequency of the departure of buses on each route.
The project will allow to improve the quality of information about the collective transport in the metropolitan area, and will improve the image of private public transport. The direct recipients of the project are residents and tourists.

PROJECT TITLE
School Mobility Plans

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
The Foundation Partnership for Environment

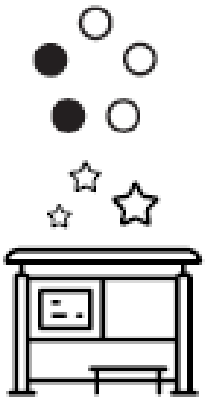


SHORT DESCRIPTION OF PROJECT
School Mobility Plans include initiatives for the provision of information, awareness-raising and the improvement of infrastructure organization and for more sustainable means of transport. The recipients of mobility plans are: students, parents, teachers.
The specific objectives of the project are:

- the reduction in the number of journeys made by car by students, teachers and parents to school;
- to provide the point and linear infrastructure for cyclists and pedestrians; to improve the quality of public transport services,

improvement of security during the journey;
promotion of the means of transport providing daily physical activity.
In addition, the objective of project is to develop a model to organize and support the process of preparation

implement of school mobility plans in the selected district of Kraków, which in subsequent years can be multiplied in the subsequent districts of Kraków to eventually cover all schools in Kraków with school mobility plans.



PROJECT TITLE
Standardization of transport solutions in KOM

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
Council commuter mobility (when)-Association of Metropolis of Krakow

SHORT DESCRIPTION OF PROJECT
Concise preparation of the development of standards for the communication infrastructure of KOM covering the following standard groups:

- standards for cycling infrastructure, including roads for bicycles, bicycle and pedestrian lanes, bicycle belts, contra belts, bicycle parking facilities based on bicycle standards applicable in Kraków;
- standards for stop infrastructure facilities along with accesses including platforms, sheds, equipment, passenger information;
- standards for car parks, B+R, P + R, K+ R;
- standards for change terminals, including the distance between platforms, infrastructure increasing the safety of change;
- standards for bus lines, including the distance between stops;
- standards for road infrastructure, including the condition of the traffic surface and the carrying capacity.

PROJECT TITLE
Integrated Information System for car parks

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
Agglomeration Council Mobility (appointed) - The Metropolitan Kraków Association

SHORT DESCRIPTION OF PROJECT
The project envisages the development of intelligent transport systems for the function of guiding drivers to free parking spaces. The system should include both private parking lots and municipal parking spaces. In the future, inclusion of parking spaces located within the municipal parking zone can be considered. In the first place the system may include parking lots which already collect information about free parking spaces. Then you need to determine which municipal parking should be provided with a tool for counting free parking spaces and be integrated them with the system.
The system could provide information for drivers in several manners:

- using information boards located directly at parking facilities, as well as in the vicinity of the parking lots;
- using traditional urban road traffic information systems;
- using a mobile application integrated with the GPS system, which will indicate to the driver the nearest few car parks and parking lots around the place towards which the driver is heading in the navigation mode;
- another place that can provide the information is an interactive web map that will help drivers to plan a their trip;

- it is possible to feed additional information into the system – e.g. information about the availability of bicycle rental stores / stations (possibility of getting out of a car and getting on public transport on a bicycle).

PROJECT TITLE
Video motion detection to control the traffic of bicycles in Cracow

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
The Board of Municipal Infrastructure and Transport (ZIKiT) in collaboration with the Department of Telecommunications AGH and potential private investor.

SHORT DESCRIPTION OF PROJECT

Gathering statistics on bicycle traffic (speed and direction of travelling) on the basis of the readout from video cameras. The project will contribute to reduce the loss of time when riding a bicycle by speeding up, increasing the liquidity of the bicycle traffic at intersections with traffic lights. In addition, it will help to promote bicycle transport by improving the quality of air. The project supports the reduction of noise and will contribute to reducing congestion (traffic congestion). The project will have an impact on the improvement of the quality of the life of residents. by reducing the costs of private transport.

The project will also allow the administrator of road explore the real intensity of bicycle traffic in real time and thus modify programs that control traffic lights, improving its efficiency.

PROJECT TITLE
Kraków Mobility Broker

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
Office of the City of Kraków

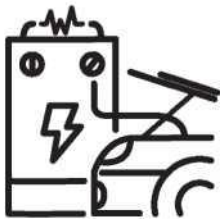
SHORT DESCRIPTION OF PROJECT

The project involves the integration of various existing applications (e.g. planning journey, cards of Kraków Public Transport, etc.), in order to provide the users with a comprehensive tool for planning and management of travel. With a few clicks, users will be able to receive the information about the way of travelling (means of transport, time, costs), health and environmental information), confirm the tickets or charges for hiring a car (in the case of jointly used cars or bicycles), etc. Users will also receive the feedback from applications on their existing mobility, and tips on how to save money and time when moving around the city. The project also envisages the organization of a loyalty program in order to promote sustainable mobility.

The application will be available in the area of Kraków and KOM, but the integration of different services (Kraków City Card + jointly used cars + bicycles) will be possible only in the area of Smart Clean Corridor of Mobility (details in the next project) in the center of Kraków.

PROJECT TITLE
Intelligent Corridor of Clean Mobility

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
Office of the City of Kraków/ZIKiT



SHORT DESCRIPTION OF PROJECT
The idea of Smart Clean Corridor of Mobility (Podwale-Dunajewski-Basztowa) involves electric mobility. The city of Kraków, together with Municipal Transport Company intends to transform bus lines running in the Smart Corridor of Clean Mobility into fully electric ones.
The 1st stage of the project means the purchase of 20 electric buses as part of the ZIT Fund. Over the next four years the purchase of additional 4 electric buses, which are expected to run on the line No. 154, which partially runs in the Smart Corridor of Clean Mobility (Basztowa Street). In the centre of the city building the station of e-mobility is also planned. It will comprise: dedicated parking for electric cars and electric bicycles, chargers for electric cars (in time located close to public transport stops).
All stations of electric mobility will be fed in at least 50% by photovoltaic solar systems.

At the stops of public transport the production of renewable energy is planned by installing ten photovoltaic solar systems, which should provide all the energy needed for the operation of the stop (light, ticket machine). Street lighting in the Smart Corridor of Clean Mobility will be converted to more efficient LED systems (need to confirm with ZIKiT).

The aim of the project is: to create a corridor of urban streets with fully intelligent mobility tools in order to improve the quality of air in the historic centre of Kraków; increase the productivity of mobility with less emission; integration of the infrastructure; to increase the economic potential of the run-down streets of the city centre, which should lead to the creation of new jobs in the small business sector; to increase the safety of vulnerable road users in the corridor; to prevent blocking the passage by streetcars by improperly parked cars.

AREA: PARTICIPATION AND THE QUALITY OF PUBLIC SPACE

PROJECT TITLE
Residential Community Centre of Local Activity (SAVE)

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
The Municipality of Kraków (including MOPS) and Forum of the Rehabilitation of Residential Community Block Development -with the cooperation of the representatives of science and NGO

SHORT DESCRIPTION OF PROJECT
The subject of the project is to create a pilot Residential Community Centre of Local Activity as the combination of traditionally understood "Centre of community" providing public services in the field of culture and cultural education

with a wide range of activities in the area of social assistance and the activation of local community. SAVE is to form a comprehensive centre of social integration, not only in the field of instrumental activities, appropriate for institutional forms (type: communal house of culture), but supplemented to the formula of social self-organization in a significant way. The SAVE space should include both specific functional elements, as well as a communal space, "arranged" depending on the current needs. The organizational formula should correspond to this idea allowing the implementation of the "qualified" activities, that is, the official tasks of this kind of institutions in parallel with the "ephemeral" based on the activity of self-organizing local community, corresponding to the formula of the so-called "social" community centre. SAVE is supposed to be an example of cooperation of different organizations and institutions from different sectors (self-government, NGO, local businessmen) as well as neighbouring groups or parish groups.

PROJECT TITLE
Local Activity Academy

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
The Office of the City of Kraków, as the initiator, coordinator and the principal in consultation with other units of the Office of the City, regional local government units of Kraków Metropolitan Area, and entities (companies, non-governmental organizations, universities), which are partners of the project.

SHORT DESCRIPTION OF PROJECT
The project involves the development of educational program associated with the whole range of modern educational methods (interactive). The content of the programme should relate to urban and metropolitan issues broadly understood, and in particular the rules and competence of local government institutions, techniques and tools of participation and socio-economic consequences of certain decisions (policies) of local authorities. The program should be of interdisciplinary nature and the proposed subject-modular -theme system (for example, a module dedicated to the participation of citizens in the process of planning or use of public information systems). Teaching methods should be tailored to the age, sensitivity and competence of the different target groups: children, young people (schools), adults (as the accompanying element in various initiatives and city projects-civil budget, local general plans) and activation of seniors (among others, UTW). Modern educational tools should be adapted to the specificities of the target groups (workshop classes, computer games, simulations, etc.).

PROJECT TITLE
Open information about the city

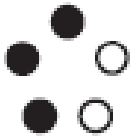
ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
The Office of the City of Kraków (the project team responsible for the preparation and implementation of the project)

SHORT DESCRIPTION OF PROJECT
The task of the project is to create a useful open database of information in a particular situation (among others):

- creation of development plans;
- information on investments (not only those of municipalities, but all investments which could be of interest to local communities);

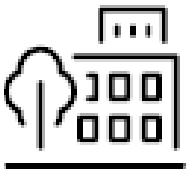
- evaluation of urban policies;
- sharing the information with the social party parties in the situation of need to use the data (projects, social consultations, investment plans, environment condition, etc.)

They will be user friendly tools for those interested in the complete visualization of information, thanks to which they can build knowledge about the condition and development of the city themselves. In accordance with the new philosophy of smart city the residents, consultancy and expert firms, the social party, active circles which conduct urban policies are not applicants, but a partner in the activities of the city. One of the tools which makes their participation possible in the creation and management of urban policies is to provide all possible data to help understand how the city functions and develops. Thanks to it the evaluation of urban activities can develop, participatory planning of development, social circulation of information.



PROJECT TITLE
Participatory design of green spaces

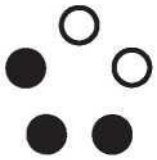
ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
The Board of Municipal Greenery in cooperation with the Department of Revitalization



SHORT DESCRIPTION OF PROJECT
The project responds to the problem of the lack of elaborated standards of design procedure of public spaces for the recreation and social integration with the participation of residents (local community. The products of the project will be:

- worked out (in the form of a "green book") standards of design procedures of public space with the participation of residents, which will be used in the design practice, especially related to rehabilitation;
- pilot project (public space) in the residential community. Ugorek and residential community. Olsza (II) prepared using tools of participatory design;

evaluation report on the space created and methodology taking into account the degree of participation/participation and satisfaction of residents



PROJECT TITLE
Micropark

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
many potential customers and contractors

SHORT DESCRIPTION OF PROJECT
The project involves the creation of micro-park, that is, a modular, green station enabling a point improvement of the functionality and aesthetics of public spaces at squares,, etc. Micropark is a place of recreation, and fun for the residents of the city. The main objective of the creation of this solution is to provide different functions of leisure in a small area for users and the introduction of aesthetic greenery in the space of square or street.

The project Micropark has been implemented as part of the project SMART_KOM

PROJECT TITLE
Urban hubs

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
Current management of the hubs will be carried out by NGO which will win in the competition with the support of unit established by the Department of the Development of the City, dealing with the coordination and monitoring of smart development of the city.

SHORT DESCRIPTION OF PROJECT
The project involves the establishment of three urban hubs in Cracow (hubs), regardless of the currently emerging Civil Centre (CO), the activities of which can be supplemented by local (district, residential community) mini-hubs, specializing in one or two subjects, and cooperating with the Civil Centre. Unused buildings belonging to the municipality can be destined for municipal hubs or if the is sufficient financial means, new buildings can be built. Hubs can be established also in cooperation, for example, with universities which have large resources. of buildings
Preliminary suggestions for the location of the urban hubs:

- NCK (Nowa Huta)
- new building on the plot at Karmelicka Street at the square behind Province Public Library,
- lent by the Jagiellonian University, building on the campus of JAGIELLONIAN UNIVERSITY on Ruczaj.

Urban hubs would create, on the one hand closed space (multi-purpose building) and, where it is possible, an open space with green areas, attractive to creative work. Such vision of the hub would allow for the creation of attractive space not only for creative work, but also to leisure

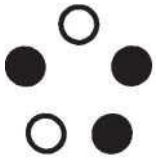
AREA: ACTIVE, HEALTHY AND SAFE RESIDENTS OF KOM

PROJECT TITLE
Senior Activity Centre Network (CAS)

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
The offices of municipalities-coordinators are the heads of functions associated with social policy/ senior policy

SHORT DESCRIPTION OF PROJECT
The project involves a system solution in the field of activation and integration of seniors in KOM. Activities will be based on partnership cooperation of JST and NGO The task of the local Centres of The Activity of Seniors will be taking action and creating the conditions for social and healthy activation and integration of elderly people. Ultimately, these are places of meetings, education and activity. CAS will offer classes, which will allow their members to develop interests and learn new skills. They will include periodic training, workshops, various types of courses for older people (including digital exclusion), as well as tourist excursions-tours, and suggestions for cultural and social events. In addition, in the proposed model each CAS is to be: the place of activities connecting generations, a volunteer center, a living lab - place of cooperation with business, for example, in the areas of telemedicine and telecare,

and providing information about the possibilities of the employment of senior citizens and related training, space for reporting needs and senior initiatives, place of social participation and deliberate processes involving seniors, place of lobbying for JST authorities taking into account senior policy in the mainstream development of JST.



PROJECT TITLE
I am near

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
Emergency medical units at a level of Region

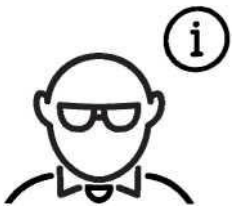
SHORT DESCRIPTION OF PROJECT

The application "I'm near" allows to send by the operator the emergency number 112 optionally another administrator of emergency and rescue services, information about the immediate risk to health of people in a public place. Information will be implemented on multimedia devices of persons who voluntarily agree to it. The condition for the operation of product is the cooperation with the operators of emergency numbers. Users of application report their readiness and take steps to effectively provide assistance to a person in the state of immediate risk to health

PROJECT TITLE
Senior Info

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
JST, NGO through tender

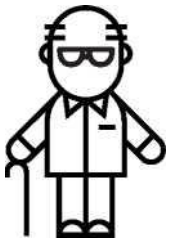
SHORT DESCRIPTION OF PROJECT



The project involves the creation of a database with the activities carried out for the elderly in the KOM (current database available on the website krakowdlaseniora.pl does not take into account many activities taken in different organizations, does not go beyond the area of the city).. In addition, the project assumes the integration of information about constant activities, one-time and project actions organized by GMK, NGO and private entities. The base should be of open character and be administered by a person with the right skills and permissions in the system (service providers introduce the data themselves based on the fixed form, and the information is available to users of platform only after the acceptance by the coordinator). In each report of offer the time of duration should be included. Before the expiry of the validity the system should automatically send reminders to the service provider about the date of the expiry of offer, offers should be automatically removed from the system after the expiry of the deadline The premise of the project is to create a web platform adapted to the needs and skills of elderly people (ergonomics, intuitiveness, etc.). In addition, the hotline will be created the operators of which will provide information about the offer, which is on the website (for seniors ho do not use Internet).

PROJECT TITLE
Home of active and healthy senior (Living Lab)

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
many possible customers and contractors



SHORT DESCRIPTION OF PROJECT
The project concerns the launch of "active and healthy home for the senior" as a functional care facility for the elderly and disabled people, at the same time playing the role of the laboratory to develop and test innovative technologies and solutions for independent and active life (Independence Solutions).

The role of the laboratory will be carried out in cooperation with the users of home. boarders and personnel who will participate in projects consciously, including the evaluation or testing the solutions proposed. The function of the laboratory will be capable of demonstrating, testing and monitoring the activities and obtaining feedback on new solutions, while ensuring standards in terms of safety, privacy and ethics.

Home-laboratory will allow to concentrate the competence in one place, experience and resources necessary to stimulate and support the development of innovative projects. Methods for rapid designing, prototyping and testing solutions will speed up the marketing of innovations, for which the demand is growing and the market around the world.
The laboratory will perform the role of the demonstration and training point in which the persons concerned will be able to know and learn to use the new technologies introduced to the public use-preventing technical exclusion due to age or disability. In the stay part home will also have activity, educational and integration functions, including relationships between generations.

AREA: INFORMATION MANAGEMENT POLICY IN PUBLIC INSTITUTIONS BY OPENING DATA

PROJECT TITLE
Opening the data (PILOT) in selected institutions of Kraków Urban Area

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
Units interested in the opening of data at their disposal. The project can be coordinated through the agency in charge of public information, whose one of the main tasks would be the implementation of the plan of opening data in the area of KOM by various institutions.

SHORT DESCRIPTION OF PROJECT
The aim of the project is to open information resources which are gathered by public institutions in their registers and processed for the needs of their business, and which are not currently available to a wider audience because of the way they

are stored and processed. The project involves several fundamental stages, including: the development of a pilot plan for the opening of data by a team of experts from different institutions from the city and KOM; inventory and categorization of information resources; development of security policy, privacy policy, rules of certification and licensing rules of data; a study of the demand for the inventoried data and development of the road map and making them available; selecting methods and tools to share data; sharing data and big data. The project products will be:

- a group of open sets of data (OD);
- a set of operating procedures, which will organize the processes of preparation, quality check, update, security and publishing the sets of OD, or responding to failures;
- the information system composed of hardware and software, which will provide OD sets and improve the procedures of their publishing and managing.

These products build up the main effect of the project: to create and start the OD service delivering continuously sets of open data from Kraków and Malopolska region.

PROJECT TITLE

Establishing Chief Information Officer (CIO) in the City Office of Kraków and the agency in charge of public information for KOM

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT

President of the City of Kraków (creation of CIO). With regard to the establishment of the Agency in charge of public information:

- CIO-coordination of the process of establishing the agency;
- entities forming part of the agency, including: The Office of the City of Kraków, urban management, organization and executive agencies as well as companies and municipal foundations, Malopolska Provincial Office, the Marshal's Office of Malopolska Region, Main Statistical Office, universities, chambers of commerce.

SHORT DESCRIPTION OF PROJECT

The project involves the appointment of a person in the City Office of Kraków structures, who will exert the function of the Chief Information Officer and CIO team which will hold substantive competence: legal, organisational and computer science. The main tasks of the CIO will be coordination of activities at a level of the City Office of Kraków and municipal organizational units involved in the construction of urban information resources, developing strategies of information management in the city and coordination in the implementation of projects affecting the generation of information about the city and the implementation of the plan of open the data in the City Office of Kraków.

In addition, as part of the project, the establishment of interinstitutional agreement between all units subordinate to the President of the City, UMWM, MUW and other entities for the establishment of an agency in charge of public information for KOM is planned, which should include one representative of each of these units with competence to design specific solutions. The establishment of the agency will help to build the information system about the city and enriching it with the data of other entities and institutions, and will provide easier coordination and more efficient implementation of joint projects between different offices and institutions.

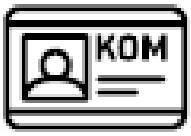
PROJECT TITLE
Municipal Contact Centre (Mcc)

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
The Office of the City of Kraków, Chief Information Officer (CIO), in collaboration with the Agency in charge of public information.

SHORT DESCRIPTION OF PROJECT
The project involves the establishment of a dedicated unit for contacts with the city residents which deals with the communication of city broadly understood with local residents and social consultations. Different forms of communication will be used: phone (one city hotline) and fax, the application for mobile devices, the "live chat" and the contact form on the website, email, stationary point for receiving applications in the office or temporary points scattered all over the city in cooperation with districts councils. The predominant channel of communication will be hotline (New York model number 311 or Warsaw 19115-idea which was successful in many cities in the world). The information system used to handle the reports will aggregate the incoming reports through different channels and will allow to control the state of each report, its number, type, way of reporting and handling.

PROJECT TITLE
Resident Card KOM

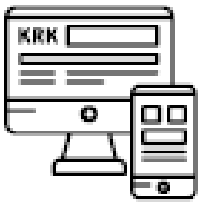
ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
Metropolitan specialized agency in charge of information technology-subject directly to the body which includes presidents, mayors and commune administrators of administration units in the KOM.



SHORT DESCRIPTION OF PROJECT
The project is to create a KOM resident card which is a digital document of the membership of a person in KOM, constituting at the same time, the centre of client authorization. All those who will want to be regarded as the residents of KOM can have the card, that is, also a group of students or regular customers. KOM resident card as: carrier of agglomeration tickets in collective transport; digital parking card within the metropolitan area; certification of eventual reductions and discounts offered by cultural, educational institutions or commercial enterprises; card of non-medical data of a patient in both CDC and NZOZ centres (no sensitive data) and a unique access key to the data necessary to attend administrative affair as part of KOM.

PROJECT TITLE
Application Apps4Krk

ENTITY RECOMMENDED TO IMPLEMENT THE PROJECT
Apps4Krk project was implemented as part of the project SMART_KOM by Kraków development studio Noname Agency Sp. z o. o. in cooperation with Kraków Technology Park.



SHORT DESCRIPTION OF PROJECT
Apps4Krk project involves the preparation of an independent Internet service, which will present mobile and web applications addressed to the residents of Kraków and applications coming from Kraków (made by developers based in Kraków, Poland). The main objective is to create a database/catalogue of the application, which in the long run, will increase the demand for applications about the city by facilitating the users the search for just such an application. The second objective is the affirmation and strengthening of local community of developers in Kraków. The element binding the objectives is to create a space for the interaction between artists and the consumer of application.
The project Apps4Krk was implemented as part of the SMART_KOM project at apps4krk.pl

WHAT`S NEXT AFTER SMART_KOM PROJECT

common challenges, new opportunities

SMART_KOM strategy is a kind of road map setting out the directions of the development striving to build smart cities. Records of the strategy are the beginning of the process of changes. It is also a proposal of innovative solutions and such that have been proven and tested in other municipal centres in the country and the world. Their implementation will be spread out over time. Some of them will be possible to implement in the short term (up to 2 years), and part due to the complexity and the need for change in system character- should be considered in the longer term (up to 10 years or later

The strategy of SMART_KOM is owned by all users of the city and surrounding communities. One of the effects of the project is the establishment of a platform, in which representatives from different institutions or city movements worked out practical solutions for Kraków and KOM in the course of the strategic works. As a result, it was possible to leave beyond the silo (closed in a narrow thematic areas) paradigm of thinking about the city. In addition, the records of strategy can be implemented both units of public administration (self-government, government), business, NGO and the residents, organised in formal or informal groups. The degree of commitment to the implementation of strategy will be the result of the needs and competence of individual entities. What is important, a set of projects saved in the strategy is not a closed list of ideas. The list is open to all new initiatives which will be consistent with the mission of the development of smart city and will form the concept of adaptive city.

The whole range of bodies authorised to carry out smart ventures makes that their funding may come from many sources. Certainly a large burden of implementation will be on the side of the local governments (at all levels) their companies and units of government administration. At this point the local government and provincial means should be mentioned, available to the residents as part of civil the budgets of the (participating). Apart from the budgets of the individual JST, the undoubtful support will be the means from European funds, in particular distributed by the Regional Operational Program of Malopolska Region (including ZIT) and national programmes, for example. Smart Development or Infrastructure and the Environment. The State Treasury can also participate in the costs of planned undertakings (intentional costs in the ministries, especially the Ministry of Sport and tourism, the Ministry of Culture and National Heritage, Ministry of infrastructure and Development; Fund for Civil Initiatives) and public institutions which have financial means from intentional funds including: National Fund of Environmental Protection and Water Management, Provincial Fund of Environmental Protection and Water Management, State Fund for the Rehabilitation of People with Disabilities or the Fund of Physical Culture Development. Social environment, business, and scientific circles can also contribute financially-along with grants and projects co-financed from external means. In the new perspective of the EU, in this program (H) 2020 from the list of projects presented in this document several grant applications were submitted -so part of the ideas-provided financing was obtained they have a big chance to be implemented in the next few years.

The partners of project have access to the best know-how related to the living lab methodology. When KPT joined a global network ENoLL in 2014 (European Network of Living Labs) it resulted in access to the latest trends and concepts relating to the design of instruments and tools and services for the city based on the concept of living lab. In parallel during the studio visits (including Forum Virium Helsinki, Smart City Lab Tallinn/Tartu, i2cat Barcelona) specific projects implemented on the basis of the methodology of living laboratories were observed. In 2015 Kraków Living Lab received the official accreditation of the European Network of Living Labs, the second centre of such type in Poland.

On the basis of experience gained, Kraków Technology Park under the signed agreements with the national partners i.e. The Office of the City of Kraków and the Office of the Marshal of Malopolska as part of Kraków Living Lab started the process of pilot testing of innovative services and products, the implementation of which can improve the quality of life of the residents of agglomeration, provided they are adapted to the needs and expectations of the latter. It also serves local businesses, which are able to offer equally high-quality products and services. The city is not then doomed to purchase ready-made solutions in the big global companies, and testing of products and adapting them to local market needs and financial opportunities takes place in natural conditions thanks to the infrastructure resources such as streets, squares, parks, public transport vehicles, etc. provided by the City of Kraków for potential tests.

We are confident that the SMART_KOM strategy will be a real tool to promote the development of a smart city and municipalities meeting the needs of the residents living in Kraków Metropolitan Area.

THE DISSEMINATION OF THE "ROAD MAP"

One of the most important determinants of SMART _KOM strategy in the "Road map for smart solutions in Kraków Metropolitan Area", is its deliberate and participative dimension. This means that the residents who are aware, and have knowledge, with access to information, decide together about issues relating to them, the neighbourhood or city-even in its metropolitan dimension. An open, two-way communication is the basis of the development of a smart city. Hence, it is necessary to agree on the principles of communication of strategic objectives.

The key issue in this regard is the nature and the role of the document "Road map for smart solutions in Kraków Metropolitan Area" as a guide showing what should be implemented and how from smart solutions in Kraków and its metropolitan area, in order to pursue the idea of smart city. "The road map" is a directional document code, not belonging to one specific owner -contractor of strategy. Hence, the so-called implementation accent of the "Road map" should be focused on the implementation of idea, along with proposals for very specific, deliberate solutions, contained in the document, that is, a general dissemination of the entries in the document.

Undoubtedly, the main objective of communication activities, or the strategy of communication should not be so much the information about the document "Road map", but rather a strategic vision of the change of Kraków and KOM. Changes in the direction of smart management, offering its users a wise solutions, contributing to a perceptible improvement in the quality of life and the functioning of city in its metropolitan area. Therefore, the basis for building the main message, should be first of all -

the mission worked out for the development of a smart city of Kraków and KOM and the adopted concept of adaptive city (adaptivity as a basis for understanding "smart" changes.

The key point to build a clear message and the communication objective will be a reference to specific target groups the activities are directed to. It should be pointed out that the recipients of the "Road map" are all users of KOM-not just the administration, but also the residents, business, universities (broken down into research circles, and students), non-governmental organisations and informal groups or political circles "The Road map" is not a strategy document of superior importance over the existing strategies of individual JST, but it is a document integrating the activities and cross-sectoral cooperation of NBSM (Science-Business-Self-Government-Residents). Therefore ,it is particularly important that in the basic message built for the purpose of communicating the idea of smart city in the "Road map", other accents in the context of the administration were heard, and other in the context of the residents of Kraków and KOM. Still other accents of communication should be emphasized in relation to the institutions or universities.

In order to effectively implement the change in Kraków and KOM municipalities, which is to take action in the spirit of a smart city, it is important that the implementation of the strategic recommendations or specific design recommendations in this document, different actors of public, economic and social life are involved. Hence the universal, broad and multi-channel activities which propagate the idea of a smart city for Kraków and KOM, become not only necessary, but constitute also a priority.

ACKNOWLEDGMENTS

Many thanks to Elżbieta Koterba (Deputy President in charge of the development of the City of Kraków) and Stanisław Sorys (Vice-Speaker of the Malopolska Region) for special commitment and support at all stages of the project.

We thank all the experts and moderators of diagnostic workshop: Bożena Pietras-Goc, Boris Czarakcziew, Leszek Michno, Marcin Kędzierski, Łukasz Franek, Jan Filip Staniłko, Rafal Garpiel, special thanks to Krzysztof Gorlich and Dagmara Bieńkowska, Justyna Szymańska, Cezary Ulasiński, Paulina Lizak and Jakub Żywiec from the Centre of Strategic Consultancy s.c. for conducting 10 strategic workshops, and cooperation during the development of SMART_KOM strategy, that is the road map for smart "solutions in the Kraków Metropolitan Area."

My thanks go also to Anna Długosz and Daniel Wrzoszczyk from the Association Kraków Metropolis, and also to the representatives of local government units, with whom we have cooperated extensively in the first stage of the project: Paweł Antosik (Office of the Municipality of Igołomia-Wawrzeńczyce), Agnieszka Juszczyk-Lisek (Office of City and Municipality of Świątniki Górne), Bogusław Król (Head of the municipality of Zielonki), Wacław Kula (Head of the municipality of Liszki), Justyna Moląg (Office of the municipality of Zabierzów), Krzysztof Musiała (Head of the municipality of Mogilany, Tomasz Ożoga (Deputy Mayor of town and the municipality of Skawina), Jarosław Sadowski (Deputy Head of the municipality of Michałowice), Adam Twardowski (Deputy Mayor and the town and municipality of Niepołomice), Dariusz Tylka (Office of the city and the municipality of Świątniki Górne).

Without your professionalism, interesting ideas and willingness to share your own experience we would not be able to draw up this document. We would like to give special thanks to the Polish and foreign partners of the project: Malopolska Region, the City of Kraków and the Technical University in Vienna and Forum Virium Helsinki. Special thanks are due to Mrs Krystyna Sadowska, Director of the Department of Promotion and Marketing, the originator of project. Thank You!

THE LIST OF PERSONS INVOLED IN WORK DURING THE WORKSHOPS AS PART OF THE PROJECT "$MART _KOM. KRAKÓW IN THE NETWORK OF SMART CITIES "

THE PROJECT TEAM ON THE PART OF THE PROJECT LEADER:

- Kraków Technology Park: Agnieszka Włodarczyk, Agata Grochal-Kolarska, Wojciech Przybylski, with the support of: Urszula Madej, Malgorzata Regulska-Hymczak, Dawid Gaweł and Krystyna Sadowska and Barbara Wityńska-Słącz (cooperation)

PROJECT TEAMS ON THE PART OF PROJECT PARTNERS:

- Marshal Office of Malopolska Region (partner of project): Sebastian Ramenda, Joanna Domańska, Grzegorz Wójcik, Beata Bańdura, Michał Kokoszka, Barbara Masłowska
- The Office of the City of Kraków (partner in charge of facts): Rafał Kulczycki, Katarzyna Wysocka, Dominika Urbańska
- Technical University of Vienna (foreign partner): Prof. Rudolf Giffinger
- Forum Virium Helsinki (foreign partner): Jarmo Eskelinen

DIAGNOSTIC WORKSHOPS-1 STAGE OF PROJECT IN THE

PERIOD FROM NOVEMBER 2013 UNTIL APRIL 2013, 2014:

WORKSHOP No 1: SMART PEOPLE
Moderator. Bożena Pietras-Goc (Foundation of the Development of Local Democracy - Malopolska Institute of Local Government and Administration)

Dorota Kawęcka (Open Malopolska), Krzysztof Mazur (the Jagiellonian Club), Elżbieta Mirga-Wojtowicz (Malopolska Office of Region), Paweł Musiałek (the Jagiellonian Club), Anna Pawlina (Kraków University of Economics), Łucja Piekarska-Duraj (Małopolska Cultural Institute), Ewa Plinkiewicz (Centre of Creative Education "Kangur"), Dominik Rogoż (Association "Siemacha"), Bartosz Szydłowski (Theatre "Łaźnia Nowa")

In addition, on the part of the partners:
-Marshal Office of Malopolska Region (UMWM):
Department of Education and Lifelong Education: Agnieszka Proniewicz, Łukasz Cieslik

WORKSHOP No. 2: SMART LIVING
moderator: Boris Czarakcziew (GPP project group SP. z o.o.)

Jarosław Bułka (Silvermedia), Wojciech Chechelski (Province Police Station in Kraków), Beata Ciepła (Food Bank in Kraków), Yolanda Gibb (NeoAlisios), Paweł Hałat (Space-People-City), Kazimierz Jurek (European Institute of Real Estate), dr of architecture Romuald Loegler (Atelier Loegler Architects), Jarosław Maj (Rescue Group R2), Tomasz Malinowski (Province Police Station in Kraków), Kazimierz Murzyn (Klaster Lifescience Kraków), prof. Jerzy Vetulani (Poland Academy of Sciences)

In addition, on the part of partners:
-The Office of the City of Kraków (UMK) and subordinate units of the Office of the City of Kraków:
Office of Social Affairs UMK: Danuta Czechmanowska
Department of Security and Crisis management UMK: Przemysław Waśniowski
Office in charge of Health Protection UMK: Beata Czar note, Ryszard Osiński
Capella Cracoviensis: Agnieszka Kopieniak, Ewelina Mikluszka
Kraków Festival Office, Congress Centre ICE Kraków: Agnieszka Ziemiańska
Municipal Social Assistance Centre: Witold Kramarz
National Army Museum: Tomasz Morański
Museum of Urban Engineering in Kraków: Maciej Turlejski
The Board of Sport Infrastructure: Przemysław Chwała

WORKSHOP N ° 3: SMART ENVIRONMENT

moderator: Leszek Michno

Paweł Augustynek-Halny (Polish fishing Union), Stanislaw Denko (Architecture Office Vision SP. z o.o.), Andrzej Guła (Kraków Smog Alarm), Paweł Hałat (Space-People-City), Małgorzata Małochleb (Polish Green Network), Michal Olszewski (journalist), Tomasz Pyszczek (Passive Architecture Pyszczek and Stelmach), Rafal Serafin (Foundation Partnership for Environment), Krzysztof Słysz (Institute of City Development),Kazimierz Walasz (Malopolska Ornithological Society), Wiesław Wańkowicz (Institute of City Development)

In addition, on the part of partners:

- Marshal Office of Malopolska Region:

Department of Regional Policy: Agata Wesołowska
Department of Agriculture and Geodesy: Małgorzata Wywiał
Department of Environment: Karolina Laszczak, Agnieszka Ptewińska-Chrzanowska

- Office of the City of Kraków:

Department of Environment Shaping: Przemysław Szwałko Department of City Development UMK: Jan Adam Barański

WORKSHOP No. 4: SMART ECONOMY
Moderator. Marcin Kedzierski (Jagiellonian Club)

Jacek Adamczyk (Malopolska Agency of Regional Development), Kamila Banasik-Brudny (Małopolski Union of Employers Lewiatan), Adam Biernat (Province Employment Office), Dawid Dulak (Centre of Studies about City), Andrzej Garbacki (ASTOR), Tomasz Geodecki (Kraków University of Economics), Robert Guzik (the Jagiellonian University), Łukasz Mamica (University of Economics in Kraków), Marcin Nejman (CGIS), Karolina Perrin (Karek Design), Michał Wojtulewicz (ASTOR), Ireneusz Wójcik (CGIS)

In addition, on the part of leader:
-Kraków Technological Park: Bartosz Józefowski

WORKSHOP No. 5: SMART MOBILITY
Moderator. Łukasz Franek (Kraków Technical University)

Maciej Górnikiewicz (Workshop of Planning and Design of Transport Systems Altrans), Marcin Hyła (Towns for bicycles), dr Arkadiusz Kołoś (Jagiellonian University), Katarzyna Nosal (Technical University of Kraków), Rafał Petryniak (LavaVision), Tadeusz Syryjczyk (Team of Economic Consultants TOR SP. z o.o.), Wiesław Wańkowicz (Institute of the Development of Cities), Michal Wojtulewicz (ASTOR)

In addition, on the part of partners:

- Marshal Office of Malopolska Region:

Department of Economic Development: Mariusz Kwinta-Pudełko
Department of Transport and Communications: Józef Kęsek, Paweł Obrzut

- Office of the City of Kraków (UMK) and subordinated units of UMK:

European Funds Office UMK Grzegorz Grzybczyk
Management of Municipal Infrastructure and Transport: Krzysztof Gałat, Marcin Wójcik

WORKSHOP 6: SMART GOVERNANCE
Moderator. Jan Filip Staniłko (Warsaw Institute of Economic Studies)

Robert Chrabąszcz (Malopolska School of Public Administration of the University of Economics in Kraków), Michał Drewnicki (Councillor of District 15 - Mistrzejowice, Kraków), Dawid Dulak (Centre of Studies about the City), Adam Kałucki (Locativo), Łukasz Krupa (Podkrakowskie Agreement), Marcin Kwaśny (Józef Dietl Foundation of Active Citizens) Krzysztof Madejski (eState Foundation), associate prof. Diana Pietruch-Reizes (the Jagiellonian University), Anna Popek (New Motivations), Rafał Sowiński (Institute of Logistics and Warehousing), Jan Strycharz (Workshop of Social Innovations)

In addition, on the part of partners:

- Marshal Office of Malopolska Region:

Department of Economic Development: Paweł Świercz

- Office of the City of Kraków:

Department of Organization and Supervision UMK: Robert Skalny, Anna Sochacka Office of European Funds UMK: Grzegorz Grzybczyk

In addition, apart from the six thematic workshops mentioned, workshops integrating the issue of smart city were implemented, with the participation of all the moderators of thematic workshops mentioned above, and also workshops with the participation of the representatives of local government units of the municipalities of Kraków Metropolitan Area: Municipalities of Igołomia-Wawrzeńczyce, municipality of Liszki, municipality of Michałowice municipality of Mogilany, municipality of Niepołomice, municipal council of Skawina, municipality of Świątniki Górne, municipality of Zabierzów, municipality of Zielonki. The meeting was devoted to the search of the specificity of a smart city and it was conducted by Rafał Garpiel.

STRATEGIC WORKSHOP - THIRD PHASE OF THE PROJECT

OCTOBER 2014 - JUNE 2015

Moderation: Centrum Doradztwa Strategicznego s.c.

composed of: Dagmara Bieńkowska, Justyna Szymańska, Cezary Ulasiński, Paulina Lizak, Jakub Żywiec, with the support of: Leszek Michno

GENERAL WORKSHOP (10 STRATEGIC WORKSHOP - 10 HRS):

Dariusz Bialik (Uniwersytet Jagielloński [Jagiellonian University]), dr hab. Andrzej Bukowski (Uniwersytet Jagielloński [Jagiellonian University]), Wojciech Chechelski (Provincial Police Headquarters in Kraków), Michał Dulak (Ośrodek Studiów o Mieście [City Studies Centre]), Łukasz Franek (Kraków University of Technology), dr Rafał Garpiel (Codework), dr Jacek Gądecki (AGH University of Science), dr Krzysztof Goerlich (Aspen S.A.), dr Piotr Kopyciński (Kraków University of Economics), dr Rafał Petryniak (LavaVision), Bożena Pietras-Goc (Fundacja Rozwoju Demokracji Lokalnej - Małopolski Instytut Samorządu Terytorialnego i Administracji [Local Democracy Development Foundation - the Malopolska Institute of Local Government and Administration]), Rafał Serafin (Fundacja Partnerstwo dla Środowiska [Environmental Partnership Foundation]), Jan Filip Staniłko (Warsaw Institute of Economic Studies), Grzegorz Święch (Nowe Motywacje [New Motivations]), Daniel Wrzoszczyk (Stowarzyszenie Metropolia Krakowska [Association of Metropolitan Kraków])

In addition, the partners:

- Marshal Office of the Malopolska Region:

Department of Regional Policy: Jerzy Czajer, Jacek Woźniak

- Kraków City Hall:

CCH IT Department: Bogdan Kaczmarek
CCH Department of Organization and Supervision: Małgorzata Chlebda, Beata Pych-Wala CCH Department of City Development: Agnieszka Czerwińska, Renata Filip

WORKSHOPS IN THEMATIC GROUPS (4 WORKSHOPS):

Group A - The multi-modal transport, including metropolitan, the environment

Łukasz Franek (Kraków University of Technology), Marcin Hyła (Miasta dla Rowerów [Cities for Bikers]), Małgorzata Małochleb (Polska Zielona Sieć [Polish Green Network]), dr Rafał Petryniak (LavaVision), Rafał Serafin (Fundacja Partnerstwo dla Środowiska [Environmental Partnership Foundation]), Daniel Wrzoszczyk (Stowarzyszenie Metropolia Krakowska [Association of Metropolitan Kraków])

In addition, the partners:
- The City Hall of Kraków and the CHK subordinate units:
CHC Department of Municipal Affairs: Magdalena Kościelniak-Barcik, Małgorzata Starnowska
CHC Department of Environmental Development: Przemysław Szwałko
The Management of Municipal Infrastructure and Transport: Piotr Dera, Marcin Wójcik

Group B - Intersectoral collaboration, participation, polycentric approach to urban development, the quality of public space
Paweł Hałat (Przestrzeń - Ludzie - Miasto [Space - People - City]), dr hab. Andrzej Bukowski (Jagiellonian University), Michał Dulak (Ośrodek Studiów o Mieście [City Studies Centre]), Piotr Knaś (Małopolski Instytut Kultury [Malopolska Institute of Culture]), dr Marta Smagacz-Poziemska (Jagiellonian University)

In addition, the partners:
- Marshal Office of the Malopolska Region:
Department of Regional Policy: Jerzy Czajer
- Kraków City Hall:
CHC Department of Environmental Development: Jarosław Tabor
CCH Department of City Development: Jan Adam Barański, Wojciech Gorczyca

Group C - Healthy prevention, the seniors' policy, silver economy, security and privacy
dr Rafał Garpiel (Codework), Wojciech Chechelski (Provincial Police Headquarters in Kraków), Wojciech Kowalik (AGH University of Science), Kazimierz Murzyn (Klaster Lifescience Kraków [Lifescience Cluster in Kraków]), Anna Pawlina (Kraków University of Economics), Dominik Rogoż (Stowarzyszenie „Siemacha" ['Siemacha' Association]), Piotr Sowizdraniuk (School of the State Fire Service in Kraków)

In addition, the partners:
- Marshal Office of the Malopolska Region:
Department of Economic Development: Małgorzata Ziarkowska
- Kraków City Hall:
Adviser to the Mayor of the City of Kraków for Seniors' Policy - Anna Okońska-Walkowicz CCH Health Protection Office: Maria Piętak-Frączek CCH Department for Social Affairs: Jan Żądło, Szymon Gatlik
CCH Department for Sport Affairs: Monika Flis, Janusz Grabiasz

Group D - Lean management and UX in public e-services and public services monitoring and controlling, open data and big data for the new concept of the city and businesses, data security.
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ABBREVIATIONS AND GLOSSARY

GIS - Geographic Information System

GOPS - Communal Centre for Social Welfare (in Polish: Gminny Ośrodek Pomocy Społecznej)

JST - Local Government Units (in Polish: Jednostki Samorządu Terytorialnego)

KOM - Krakow Metropolitan Area (in Polish: Krakowski Obszar Metropolitalny)

MARR - Malopolska Regional Development Agency (in Polish: Malopolska Agencja Rozwoju Regionalnego)

UTW - University of the Third Age (in Polish: Uniwersytet Trzeciego Wieku)

ZIT - Integrated Territorial Investment (in Polish: Zintegrowane Inwestycje Terytorialne)

ZOZ - Health Care Centre (in Polish: Zakład Opieki Zdrowotnej)

SWOT Analysis - crucial strategic analysis that identifies both internal and external factors determining the resources of the organization and its environment. The name of the technique is an acronym of first letters of words Strengths (S), Weaknesses (W), Opportunities (O), Threats (T).

B+R (Bike & Ride) - this is the bike variety of P&R ('Park and Ride') - parking for bicycles located near the peripheral public transport, according to the principle of 'park the bike and ride public transport.

Big Data - term for a large variety of variables and data sets, processing and analysis of which is difficult, but also valuable because it can lead to gaining new knowledge about the actual social phenomena and spontaneously occurring changes.

Gamification - modifying the behaviour of people in situations of non-games to enhance their participation. The technique is based on the pleasure that comes from overcoming the next achievable challenges, competition, cooperation, etc. Gamification can commit people to activities that are in line with expectations of the author of the project, even if they are considered to be boring or routine.

Urban hubs - local urban centres, common space for diverse ideas and projects, created by individuals, social groups. An urban hub plays a specific role of a local innovation centre. Its purpose is the accumulation of knowledge and experience from different areas of the city (administration, higher education, business, community organizations, units of culture and business) and joint design of solutions for the local community.

ICT (Information and Communication Technology) - a term covering a wide range of all technologies for collection, processing and transmission of information. In Polish language referred to as 'teleinformatyka'. The conceptual scope of ICT includes all communication media such as the Internet, wireless networks, Bluetooth networks, mobile TV and mobile phones, mobile and fixed audio and video communication technologies, radio, TV, etc., and the recording media (USB memory sticks, hard drives , CD / DVD, tapes, etc.), as well as appliances for the processing of information (PCs, servers, clusters, networks, etc.). In addition, ICT also offers a wide range of applications and complex IT systems to implement the processing and the transferring of data at a higher level of abstraction than the hardware level.

ITeS **(Information Technology enabled Services) - services using advanced technologies**

K+R (Kiss & Ride) - marking system of public roads that allows short, several-minutes stops and letting passengers to go off.

KOM - (in Polish: Krakowski Obszar Metropolitalny) Kraków Metropolitan Area, herein understood as an area of Kraków and 14-neighbouring communes of Krakow (the area of Kraków metropolis, which is covered by the Association of Metropolitan Kraków appointed to implement the ZIT, integrated territorial investment). Communes, that apart from Kraków, are included in the KOM: Biskupice, Czernichów, Igołomia-Wawrzeńczyce, Kocmyrzów-Lu- borzyca, Liszki, Michałowice, Mogilany, Niepołomice, Skawina, Świątniki Górne, Wieliczka, Wielka Wieś, Zabierzów, Zielonki.

Lean management - one of the concepts of enterprise management, the implementation of which enables to deliver to the customer value required by them at the lowest possible cost and with the minimum resources.

Process mapping - a technique of graphical presentation of the operation of the process or assembly of processes and their interrelations. Mapping enables to present all actions and relations within the organization in a graphical form.

Adaptive city[11] - urban area with urban infrastructure, which development is initiated and guided by citizens, and implemented by different groups of actors (stakeholders) - by the administration, public services, utility providers, private investors.
The adaptive city can operate efficiently through integrated information systems (ICT) that host and process data in real time. Conditions for the adaptiveness of the city: (a) citywide operation of ICT systems capable of collecting, sharing and processing of information, (b) open, universal access to information about the city, (c) mutual (interactive) communication between residents and the administration, services, municipal service providers, businesses, civic groups, (d) participatory planning procedures and self-improvement of infrastructure and urban services, (e) the widespread presence of information technology enabled services (ITeS). The Information Technology for the adaptive city enables the management by the means of administerring its development in order to improve the quality of life of citizens, in harmony with the natural processes of self-organization of the city.

Ashridge Model Mission- authorial tool for formulating the organization's mission, developed by Andrew Campbell from Ashridge Strategie Management Centre in the mid-90s of the 20th century. This model allows an organization to answer the basic questions: What is the company / organization meant for? Why does it exist? What is its role in the world? This model integrates the four elements, the mission parameters: PURPOSE - understood as the main aspiration of the organization's development, STRATEGY - understood as identification of main domains of operation together with indicating competitive advantages and market position, basic organization's VALUES and STANDARDS OF CONDUCT - a set of policies, procedures, rules of organizational operation. The mission formulated in such a way shows the so-called sense of mission of the organization. Thus, it is distinguished from its mission statement, which is usually one-sentence record of informational and promotional nature. In Poland, the 4-element model of the Ashridge Mission has been widely introduced into the strategic planning process, conducted both for the business and public organizations, by the Centre for Strategic Consulting.

11 The concept of an adaptive city that operates within a cycle, starting from information obtained from the individual citizen and ending on self-improvement systems and municipal plans (the so-called 'Pentagon') was established in the course of strategic workshops in the third phase of the project conducted by the Centre for Strategic Consulting team.

Open Data - the idea of 'opening data', which refers to the common shared data generated and held by various institutions, companies, groups, individuals. According to this concept, data of the public sphere should be widely available to everyone, in relation to the technical standards to facilitate its use (suitable file formats, APIs).

P+R (Park & Ride) - an interchange system under which drivers leave cars in the vicinity of the interchange bus terminals and travel to the centre by public transport.

Pocket parks / Micro parks- are small pieces of (isles) of the urban greenery, left after the demolition of the once located there building. Pocket parks are places of relaxation and rest in a highly urbanized area of the city. They often arise as a result of the initiative and with the participation of the inhabitants of the surrounding property. The tradition of creating local pocket parks is widespread in Britain and in the United States.

Public needs- are needs of a collective character, satisfaction of which requires the existence and functioning of public institutions in order to implement them. Public needs may, however, be satisfied also by other actors of the urban community: entrepreneurs (e.g. transport companies, investors in the PPP systems (public-private partnerships): private public car parks), civic groups (e.g. community schools), neighbour agreements (e.g. for common transport or maintenance of greenery).

Public space - an area of particular importance to meet the common needs of residents, improve their quality of life, and favourable to social networking due to its location and functional and spatial characteristics. The public space should carry out functions designed to meet the needs of citizens of a social, service or cultural nature.

Renaturalisation- a process of restoring the natural state of the environment, possibly similar to the original state (prior to human intervention).

Smart People - initiators of changes in the city are residents who, due to the commitment, qualifications and skills, creativity and interaction skills, with the support of information and communication technologies (ICT) are able to strive for continuous improvement in the quality of life in the city. The Smart People area consists of the following such sub-areas: education for everyone (including lifelong learning, universities of the third age, activation of elder people), active NGOs, broad civic participation, acquainted national and ethnic minorities, broad access to culture.

Smart Living - an intelligent city provides its residents a friendly place to live by the guarantee of the developed social infrastructure, access to healthcare, better cultural and leisure offer, housing policy corresponding to the needs of the inhabitants, a high level of security, as well as it provides care for the environment and green areas, sensitivity in relation to issues of social exclusion or poverty areas.

Smart Environment - a sustainable management of resources (water, energy, waste), attention to environmental cleanliness and safety in terms of flooding possibilities, as well as harmonizing spatial planning with regard to the role of green areas within the city.

Smart Economy - an advanced entrepreneurship and diverse, dynamic labour market, a well-planned economic structure of the city (including key industries), tourism, promotion of economic and pro-investment policy, as well as innovation policy, which is closely linked elements of a smart city, local economy and science.

Smart Mobility - a well-organized public transport in the city and in the agglomeration, as well as pedestrian and bicycle traffic in the city, high quality roads and modern traffic control systems and high availability of transport.

Smart Governance - is understood as public management, in which an important role is played by: the transparency of decision-making, public consultations, developed participatory budget, prospective strategic thinking and planning, implementation of the concept of e-governance and widespread use of open data. All this creates high quality public services.

Silver economy - term for a sector of the economy aimed at elder people.

User Experience /UX - all the sensations experienced by the user when using the product. User experience development is used to produce such systems, products or projects that will bring about positive experiences with users, who interact with them.

UTW - the University of the Third Age - a educational institution for people at the post-working age.

Charette Workshops - the method for engaging people interested in the development of the area, in its design through participation in several days of intense sessions, involving representatives of the municipality, urban planners, developers, but also residents and other people interested in the local area The result of these sessions is to come out, by mutual consent and consultation, with the concept of the area development.

Quest - a kind of urban game, which goal is to discover the city or its specific places using clues.

Integrated Territorial Investment (ZIT) - an instrument which enables partnerships of local government units (JST) of cities and functionally related areas (city and local governments under its influence) in order to implement joint projects that combine actions financed by the European Regional Development Fund and the European Social Fund. When it comes to Kraków and the KOM, the ZIT is a part of the Malopolska Regional Operational Programme 2014-2020.

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