"Construction and Implementation of a Dedicated IT System for the Provision of Modern Local Government Administration Services in Krakow", co-financed with the Funds of the European Economic Area Financial Mechanism and the Norwegian Financial Mechanism

Krakow, 2011

Contents

1. Introduction

1.1. Description of the City of Krakow

Krakow is a harmonious combination of centuries of tradition and cultural heritage as well as modern civilisation achievements that ensure access to latest technologies and a high standard of living.

Krakow's history goes back more than one thousand years and has brought forth rich scientific and artistic traditions as well as a collection of unique masterpieces of architecture, painting, and sculpture. Due to those factors, Krakow has, for many years now, functioned as a cultural, educational, economic, service, and tourism centre in Poland and the entire Europe.

Today's Krakow is, in terms of population and area, Poland's second largest city. It is currently inhabited by approximately 760,000 permanent residents, but each year it is also home to several dozen thousand people, mainly university students, who live here temporarily. 60% of Krakow's inhabitants are under 45, making the city an attractive investment market.

Photograph 1 The Wawel Dragon

Source: Krakow City Office Archives

1.1.1. Higher Education

Krakow is a dynamic scientific centre. The number of universities, students (including foreign students), and the diversity of education majors are a clear indicator of the city's rich intellectual potential. Krakow's tertiary education sector comprises 23 educational institutions (including 10 state-controlled universities and 13 private tertiary schools) which employ approximately 22,000 people (including 1,427 professors) and educate almost 212,000 students (the number includes students of postgraduate, doctoral, and extramural studies).

The city is the seat of the famed Jagiellonian University, branches of the Polish Academy of Sciences, head offices of the Polish Academy of Arts and Sciences, the Book Institute, the National Science Centre, the National School of Judiciary and Public Prosecution, and numerous other research institutes and science centres. The city can also boast its European College, comprising the International Primary School of Krakow, the European Private Secondary School (licensed to offer the International Baccalaureate Diploma Programme), and the European Private Middle School. Moreover, several high schools

operate bilingual classes, where the teaching of selected subjects takes place in a foreign language.

Aside from numerous language schools, the city has also organisations whose goal is to promote the culture of other countries, teach their language, or promote their cultural heritage (e.g. the Spanish, Italian, German, and Austrian Institutes, or the Manggha Centre of Japanese Art and Technology).

1.1.2. Location / Transportation

Krakow is located in the south of Poland, in the central northern part of the Malopolska Province (*wojewodztwo malopolskie*), upon the Vistula river. The city sits at an intersection of several geographical regions: the Krakow Gate, the Oswiecim Basin, the Sandomierz Basin, the West Beskid Foothills, and the Krakow-Czestochowa Upland. Krakow's attractive location makes it a wonderful base for trips to the Polish mountains or the picturesque Krakow-Czestochowa Upland. The city is also a crucial road and railway junction. The A4 motorway ensures a quick and convenient route to Silesia and Germany, and in the future, to Lvov (Ukraine). Balice near Krakow is the location of Poland's second largest airport – the John Paul II International Airport, which operates transatlantic flights, direct domestic flights, and international connections to many cities in Europe and on other continents. Fast and comfortable travel is also made possible by a well-developed railway network and the successively modernised bus network.

1.1.3. History

Archaeological work and research suggest that the first traces of settlements in the territory of today's Krakow date back to the Palaeolithic Period. The Krakus and Wanda Mounds, commemorating the legendary rulers of the settlement inhabited at the time by the Slavic tribes of Vistulans, are estimated to have been built in the 7th century.

A unique role in the rich history of Lesser Poland's (*Malopolska*) capital was played by King Casimir the Great, a patron of the arts and sciences. During his reign, the Gothic churches of the Franciscans and the Dominicans were built, the construction of St. Mary's Basilica was underway, as was the work on the Corpus Christi and St. Catherine churches in Kazimierz, reconstruction of the cathedral and the castle on the Wawel Hill, the Cloth Hall medieval markets, the city hall, and various other public buildings. In 1364, Casimir the Great founded the Krakow Academy, which later came to be the Jagiellonian University.

The time of Krakow's greatest developments came in the early 16th century. The Italian architects who came to the city were responsible for architectural improvements: the Wawel Royal Castle became one of Poland's most beautiful Renaissance edifices, and the Sigismund Chapel, designed by the same architects, is the country's most impressive mausoleum. Also in the 16th century, in 1520 to be precise, the sound of the Sigismund Bell was heard for the first time; it continues to ring to this day to mark important events in the history of Krakow and Poland.

Starting in 1596, King Sigismund III Vasa began moving his royal court from Krakow to Warsaw, which contributed to a stoppage in the development of Krakow and a decrease in its significance.

Poland's 3rd partition, in 1795, began decades-long occupation of the capital of Lesser Poland. Still, in the 18th and 19th century, Krakow was the symbol and centre of the Polish

national character, and the spiritual capital of the country. Scientific and cultural institutions were developing: the Krakow Scientific Society evolved into the Academy of Learning, the Academy of Fine Arts was founded in 1818, and the Society of Friends of the Fine Arts was established in 1854.

Starting around mid-19th century, along with the development of the autonomy of Polish Galicia, Krakow began to regain its former splendour. Universities with Polish as the language of instruction, including the Jagiellonian University, attracted students from all of the partitioned territories. A number of artists (such as Stanisław Wyspiański, Jan Matejko, Tadeusz Boy Żeleński, and Adam Asnyk) emerged and went on to make Krakow famous through their work.

The Second World War, even though it did not take a great toll on the historic architecture, it all but destroyed the Krakow intelligentsia, who were taken to the Sachsenhausen concentration camp in early November 1939.

Today, Krakow is considered a jewel among the cities of Poland. Thanks to the numerous monuments of visual arts and architecture, as well as strong scientific and cultural backing, the town is renowned throughout Poland, Europe, and the entire world.

Photograph 2 The Krakus Mound

Source: Krakow City Office Archives

1.1.4. Administration

Under the current administrative division, Krakow is the capital of the Malopolska Province and the seat of the Province Governor, the Province Marshall, and the Krakow District Governor.

The legislative and controlling branch of the local government in the Municipality of Krakow is the Krakow City Council, and the executive power is held by the Mayor of the City of Krakow. The Krakow City Council adopts a statute that determines the city's government system.

The first Statute of the City of Krakow was adopted by the re-created local government in 1991. Throughout the subsequent terms, the statute undergone changes and amendments, until it reached the current wording adopted through Resolution LXXV/732/05 of the Krakow City Council of 13 April 2005 on the announcement of a consolidated text of the Statute of the City of Krakow. The residents of Krakow are, under law, a local government community – a municipality (as of 1 January 1999, following a subsequent public administration reform of the country, Krakow has also become a city with county rights). Having legal personality, the City of Krakow acts on its own behalf and at its own responsibility.

The City of Krakow keeps its traditional name of the Royal Capital City of Krakow and uses the shortened name: the City of Krakow. The city's colours are white and blue, and its escutcheon and seal designs have been approved by a resolution of the Krakow City Council.

1.1.5. Krakow in figures

- Area: 327 km²
- Location: the coordinates of the Adam Mickiewicz monument in the Main Market Square (the heart of the Old Town) – 50° 03' 41" N and 19° 56' 16'' E; near the south-east border of the city (Quarter X – Swoszowice) – intersection of the 50° N parallel and 20° E meridian
- Length north to south: 18 km
- Length west to east: 31 km
- Highest point: 383 m AMSL – the Piłsudski Mound
- Lowest point: 188 m AMSL – mouth of the Potok Kościelnicki creek
- Total annual precipitation: 619 mm (in 2008)

1.2. Main Objectives of the Project

The Project: "Construction and Implementation of a Dedicated IT System for the Provision of Modern Local Government Administration Services in Krakow" co-financed with the Funds of the European Economic Area and the Norwegian Financial Mechanism under Action 2.4: *Human resources development through, inter alia, promotion of education and training, strengthening of administrative or public service capacities of the local government or its institutions, as well as strengthening of the democratic processes that support it.*

The objective of the Project is to create a modern IT system intended to store, process, and make available spatial information for the City of Krakow and the Krakow Metropolitan Area with the aim of providing local government administration services in Krakow. The system covers three thematic fields: the investment process, education, and tourism and historic monuments.

Furthermore, the objectives of the Project include broad-rage training actions utilising the latest knowledge gaining techniques (including e-learning), aimed at improving the qualifications of the administrative staff.

The Project produced the following applications:

Tourist Portal – a website aimed directly at companies and institutions operating in the tourist industry in the Krakow region, which allows to publish profiled information for representatives of the industry and allows the interested entities to contact the City Office directly. The portal is also an excellent multimedia database containing archive material related to the history and current events taking place in Krakow, which is especially useful from the point of view of tourism.

Education Data Warehouse – integrates data originating from various systems used in the operations of the Krakow City Office and related to issues concerning the education system. The warehouse is an extensive tool, allowing an effective analysis of the gathered data and presentation of the results thereof in the form of reports. The warehouse's reporting mechanism allows categorising and joint usage of the reports by the City Office employees.

Investor Portal – a system providing support in the decision-making process and tidying up the process of obtaining building permits. Attachments to the application for a building permit may not be sent digitally as it is not allowed under Polish law. The system directs the investor to the appropriate services published on the ePUAP Platform with consideration for investment-specific conditions. At the same time, the process management mechanisms control its completeness and the user is regularly provided with current information on the costs and estimated lead times for individual stages. The Investor Portal is directed at both business entities and entities seeking to begin land development investments.

Municipal Geographical Information System Portal (MGISP) – the official spatial information portal of the Krakow City Council based on modern web technologies. The portal's function is to visualise, in the form of maps, a range of data gathered at the Krakow City Office, including:

- plot borders, building contours, building numbers, and address points,

- borders of streets and street names,
- utilities,
- quarter borders and names,
- contours of rivers, streams, and bodies of water,
- locations of nurseries and local government preschools,
- locations of primary and middle schools,
- borders of primary and middle school districts,
- areas of the city under the care of the monument conservator,
- land use plan,
- local zoning plans,
- protected green areas and locations of valuable natural monuments,
- acoustic maps.

The MGISP is divided into four thematic categories:

- investors,
- education,
- tourism,
- general.

The portals utilise the same data repository and feature similar functionalities. However, the selection of baseline data for the individual portals and the editing of each portal is tailored to fit the needs of the respective user groups. This facilitates the use of the data by the interested parties.

The Municipal Geographical Information System Portal allows to, among other things:

- display maps from various services, including the possibility of adjusting the level of transparency,
- display data recorded in various systems of reference within one system,
- use of Google Maps or Microsoft Virtual Earth data,
- record and recreate the current map context.

The technology used allows to review any geographical information provided by international web-based map systems, such as the Web Map Service (WMS) or Web Map Tile Service (WMTS), and to post queries to the Web Feature Server (WFS).

"Virtual Tour of Krakow" – an application allowing a tour of Krakow without leaving your home. It includes about 860 spherical and cylindrical panoramas of the city that can be viewed via an Internet-connected web browser. The "Virtual Tour of Krakow" also contains descriptions and audio tracks translated into English and Norwegian. The application is divided into four "walks":

- "The Old Town",
- "Kazimierz",
- "Podgórze",
- "The Planty".

The individual "walks" lead through the city's streets as well as uncover the interiors of the city's most impressive locations to the virtual tourists. The application also includes panoramas of interesting spots that are located off the routes of the "walks", while additional attractive features include night-time photos and panoramas of the illuminated monuments of Krakow.

As a result of Project PL 0439, an IT system providing modern local government administration services was created, which will ensure:

- **improvement of the efficiency of fulfilling public administration functions** through streamlining the services provided to the residents and lowering the costs of the operation of public administration,
- **increasing community participation in the processes of planning and developing the municipal agglomeration**,
- **wider access to information**, i.e. transparency of public administration activities and an increase in the community's involvement,
- **economic and touristic promotion of the region**, and, in particular, a versatile development of the City of Krakow and the Krakow Metropolitan Area (KMA), an increase in the number of visitors to the city and the KMA, as well as an increase in employment.

The Project is valued at approximately PLN 2,800,000.00, 85% of which (approx. PLN 2,380,000.00) is provided with the funds of the European Economic Area Financial Mechanism, and 15% (approx. PLN 420,000.00) is the contribution of the Municipality of Krakow.

The investment was carried out with the participation of a Norwegian Partner: the City of Bærum. The partnership consisted in an exchange of experiences and additionally allowed to analyse the possibility of transferring Norwegian solutions with regard to the development and application of the latest IT technologies in local public administration into Polish environment.

Furthermore, the Project was carried out in cooperation with the Wieliczka County and the Krakow County, as well as based on informal partnerships with territorial local government units, which will subsequently be able to implement the solutions developed at their own offices.

1.2.1. Members of the Steering Committee and the Project Team

Steering Committee

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Deputy Chairman: Grzegorz Żych – IT Department of the Krakow City Office (KCO)

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Stanisława Górska – Department of Architecture and Urban Planning of the KCO

Beata Tracka-Samborska – Department of Education of the KCO

Katarzyna Gądek – Department of Information, Tourism, and City Promotion of the KCO

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Małgorzata Mrugała – Department of Environmental Management of the KCO

Janusz Moskwa – European Funds Bureau of the KCO

Secretary of the Steering Committee: Jerzy Zieliński – European Funds Bureau of the KCO

Permanent Guests of the Steering Committee:

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1.3 Description of the Municipality of Krakow in the Context of the Thematic Fields Covered by the Project

The planning and performance of the Project entitled "Construction and Implementation of a Dedicated IT System for the Provision of Modern Local Government Administration Services in Krakow" (code name PL0439) takes into consideration the goals set out in the Krakow Development Strategy, a long-term programme for constant and sustainable development aimed at meeting strategic and operational objectives. This means achieving a balance between the economic, social, environmental, and heritage protection objectives that would bring about further improvements in the residents' quality of life.

Among the operational objectives of the Krakow Development Strategy adopted on 13 April 2005 by the Krakow City Council by means of resolution no. LXXV/742/05, the following were stipulated:

- objective II-4: development of the small and medium enterprise sector,
- objective I-2: enhancement of the scope and accessibility of education for all age groups and improvement of the quality thereof,
- objective II-6: increasing the city's touristic attractiveness,
- objective I-8: development of the local government and improvement of the management methods, enhancing the community's awareness and involvement in the life of the city.

The manner of achieving those objectives is defined by sector programmes. Objective I-8 has been defined as a sector (basic) programme known as: "Programme for Enhancing the Quality of Public Services", and includes the creation of ICT solutions supporting the achievement of objectives II-4, I-2, and II-6.

A part of the programme is Order of the Mayor of Krakow No. 1508/2006 of 26 July 2006, determining the actions of the Krakow City Office as a unit providing public services. The document indicates actions related to improving the computerisation of the City Office.

Those issues have subsequently been addressed in a separate document entitled "Strategy for the Development of the Krakow City Office IT System" of 2007, adopted by Order of the Mayor of Krakow No. 1711/2007, which considers the priorities listed in a document entitled "Directional Strategy for Computerisation Development of Poland until 2013 and Long-Term Forecast for the Transformation of Information Society until 2020" (document adopted by the Council of Ministers on 29 June 2005), including: the development of a wide and attractive offer of services available via the Internet and audio-visual digital media, as well as the development of digital resources.

The Krakow City Office has been appointed to fulfil public tasks. One of the components of modern management of those tasks is the Quality Management System implemented in accordance with the ISO 9001:2008 standard. In accordance with the division adopted by the System, public tasks include providing services in the groups of management processes, performance processes, and support processes. Performance of those tasks involves cooperation between the organisational units of the KCO and between the KCO and the municipal organisational units on the following levels:

- External Client – KCO: this level includes processes related to the provision of administrative, social, and municipal services to the residents and business entities,

- KCO – KCO: this level covers the cooperation of KCO organisational units in the performance of all services and tasks, as well as control and supervision,
- KCO – MOU: this level covers ordering the performance of tasks, supervision, and control.

The performance of public tasks, including KCO's obligations to ensure compliance with acts and resolutions, must be supported by modern ICT solutions. The basic assumption of maintenance and development of the KCO IT System (hereinafter the KCO ITS) is taking into consideration the development of IT technologies as well as the domestic and world-wide tendencies in IT.

The Krakow City Office provides services to external clients, who may include individuals – the city's residents and its guests, and institutions – businesses, universities, and other organisations.

An external client seeking to settle some matter wishes to be serviced quickly and with the required competence. They expect a short queue, the bare minimum of formalities, and a final decision favourable to them. In the light of the increasingly common Internet access, they would like to be able to settle their issues without visiting the City Office – except for the absolutely necessary cases – as well as be able to track the stages of the processing of their case on-line.

They also expect to be able to find on-line all the necessary information, which may enable the client to prepare the appropriate documents, assess the chances of a favourable outcome, and verify the waiting time for the decision to be made.

The City Office is aware that its operations are a form of service and that its organisational undertakings should strive to enable a better way of performing the service. This is also the goal of the development of the KCO ITS.

Project PL0439 is consistent with the objectives set out in the Strategy for the Development of the KCO ITS, i.e.:

- objective 1: Openness with regard to information – actions meant to achieve that end include: Development of communication portals (Internet, Intranet, Extranet),
- objective 2: Efficient service to external clients (limiting the number of visits to the office) – actions meant to achieve that end include: Implementation of the investor servicing system,
- objective 3: IT support of the largest possible number of processes at the city hall (prevention of duplication of the clerk's activities) – actions meant to achieve that end include: Development of the geographical information system and implementation of a training programme for the users of new and existing applications.

In the course of the Project, pursuant to the requirements of the Feasibility Study for the "Construction and Implementation of a Dedicated IT System for the Provision of Modern Local Government Administration Services in Krakow", modern IT tools have been provided for the purpose of supporting the management of the Municipality of Krakow with regard to the following fields:

- the investment process,
- education,
- tourism and historic monuments.

1.3.1. Investment Process

The investment process is understood as the entirety of actions undertaken by an investor and the Krakow City Office and aimed at making the initiation of construction works in a manner compliant with the provisions of the law possible. The detailed scope of the investment process, that is the number of procedures, and, consequently, its duration, depends on the investment needs of the investor. The investment process may be divided into stages; the number of stages of the investment process is a consequence of the legal requirements concerning the preparation and obtaining of the appropriate documentation and of the investor's plans.

The investment process may, in particular, be divided into the following stages:

- selection of the location of the planned investment,
- obtaining the right to use of the real estate for construction purposes,
- determining whether the planned investment is an undertaking that may have a significant environmental impact,
- determining whether the location is covered by the local zoning plan,
- determining the land development conditions / the location of a public purpose investment (in the event of the lack of a local zoning plan),
- obtaining the necessary permits required under the Water Management Act, tree removal permits, carrying out the necessary geological works (if required),
- obtaining a construction permit decision / declaration of construction works,
- commencement of construction works,
- commissioning.

The core flow of the investment process will therefore concern the time from selection of the location for the planned investment until commencement of the construction works. Of secondary interest to the investor will be the stage of commissioning the investment.

During each of the stages listed above, the investor carries out the respective investment procedures available at the Krakow City Office. Due to the complexity of the process, it takes place in four organisational units of the KCO:

- Spatial Planning Bureau (SPB),
- Department of Architecture and Urban Planning (AUP),
- Department of Geodesy (GD),
- Department of Environmental Management (EM).

Prior to the performance of the Project, the investment process was supported by Logos Enterprise, which allowed the execution of orders concerning selected geodetic materials to be handled by KCO employees on-line.

The "Investment Process" portal, made available to external clients under the Logos Enterprise application, handles four of the investment process procedures.

However, the applications implemented several years ago failed to meet the necessary functional and legal requirements. It was, therefore, necessary to modernise them by implementing a new solution that would comprehensively support both the investor and the KCO employee involved.

1.3.2. Education

In the academic year 2010/2011, the Municipality of Krakow, in fulfilling the tasks of the municipality and the county, operates 564 schools and educational institutions of diverse kinds, located in 350 organisational units, and the Economics of Education Team in Krakow.

As part of the performance of the tasks of a municipality, the City of Krakow operates:

- 114 preschools and six special needs preschools,
- 98 primary schools (including 14 schools integrating disabled and able-bodied pupils or schools with such branches and 13 sports-oriented schools or schools such branches),
- 57 middle schools (including 11 middle schools integrating disabled and able-bodied pupils or middle schools with such branches and 11 sports-oriented middle schools or schools with such branches, and three middle schools with vocational training branches),
- one middle school for adults (no recruitment).

As part of the performance of the tasks of a county, the City of Krakow operates:

- 16 special needs primary schools,
- 16 special needs middle schools,
- 23 special needs secondary schools: three high schools (recruitment in two), one complementary high school, two specialised high schools (recruitment in one), two technical high schools, one complementary technical high school, five basic vocational high schools, nine vocational training schools,
- two special needs postsecondary schools,
- 107 secondary schools: 37 high schools (recruitment in 34), 19 specialised high schools (recruitment in eight), 26 technical high schools (recruitment in 25), 25 basic vocational high schools (recruitment in 18),
- 16 complementary technical high schools for graduates of basic vocational schools (recruitment in one),
- 17 postsecondary schools (recruitment in two),
- 52 schools for adults based on middle schools, basic vocational schools, or high schools: five high schools (recruitment in one), four complementary high schools (recruitment in one), one specialised high school (no recruitment), three technical high schools (recruitment in two), 23 complementary technical high schools (recruitment in ten), two basic vocational schools (recruitment in one), 14 postsecondary schools (recruitment in nine),
- three 1st degree music schools,
- one 2nd degree music school,
- one music high school,
- five inter-school sports centres,
- two inter-school swimming pools,
- three dormitories,
- eight psychological and pedagogical counselling centres,
- 11 youth community centres,
- Youth Educational Centre,

- two juvenile shelters (including one seasonal),
- Continuous Learning Centre,
- Practical Education Centre,
- 20 dormitories located in special purpose schooling and education centres (nine) and school complexes (11).

Moreover, the Municipality of Krakow keeps a register of non-public schools and facilities, issues permits for the creation of public schools and preschools to individuals or legal entities, and grants subsidies to such schools and facilities.

As at the academic year 2010/2011 (as at 31 December 2010), there are 459 non-local government facilities of various types registered in Krakow, of which 304 are subsidised by the municipality (82 preschools, 11 day care centres, 32 primary schools, 38 middle schools, 128 secondary schools and basic vocational schools for youth and adults, and nine other facilities).

There are 99,368 children, youth, and adults enrolled to local government schools and preschools in the academic year 2010/2011 (including 492 students of hospital schools), whereas schools and preschools operated by other entities are attended by 30,069 students. Those figures amount to a total number of 129,437 students (130,446 in the academic year 2009/2010).

In the academic year 2010/2011, teachers in local government schools are employed in 11,141.43 full-time positions (12,549 people), of which 94.8% are teachers with the highest possible qualifications. The highest professional degree – that of a certified teacher – has been obtained by 54.82% of teachers.

The City spent PLN 997.7 million in 2009 for the performance of its duties with regard to education (sections 801 and 854) including investments (PLN 924.1 million in 2008). There are 351 organisational units (including one Economics of Education Team) financed as budgetary units in the academic year 2010/2011. 107 units (including the EET) receive funding directly from the budget of the City of Krakow, while the remaining 244 units receive their funding through the Economics of Education Team (from 1 January 2010).

The schools operated by the Municipality of Krakow, as at 1 September 2010, had at their disposal 5,778 computer sets (hardware and software) used by the students for learning purposes, of which 3,830 were computers with broadband Internet access.

The Department of Education of the KCO is responsible for matters relating to preschools, primary schools, middle schools, secondary schools (e.g. high schools, high school complexes, vocational schools), schools integrating disabled and able-bodied pupils, sports-oriented schools, special needs schools, psychological and pedagogical counselling centres, and other schooling and education centres. Moreover, the Department of Education monitors the operations of the Economics of Education Team and provides support to the Deputy Mayor with regard to the Deputy Mayor's supervisory duties.

The work of the Department of Education has already been supported by the following IT systems prior to the implementation of the Project:

- Education Platform – for several years the Education Portal has provided the means of e-recruitment for the city's secondary schools, preschools, middle schools, and, for the first time in 2011, to primary schools. Other modules operate with the Education Platform as well; one example is a module containing vital information updated by school headmasters and the Department of Education, a

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database of educational institutions operated by the Municipality of Krakow, a module used for handling school scholarships, allowing to efficiently process and verify the information necessary for the granting of a scholarship, or a module improving the supervision over mandatory education.

- Integrated Education Management System (IEMS) – the goal of the Integrated Education Management System is to ensure uniform software, uniform principles, and an ongoing flow of information between the Department of Education of the Krakow City Office, the Economics of Education Team, and the schools and educational institutions. At the level of an individual educational institution, the Integrated Education Management System provides the headmaster with a unified tool for managing various aspects of the school's activity, including the preparation of an organisational sheet, staff management, payroll calculation, managing the school's assets, financial management, school budget planning, students registry, and handling the digital flow of documentation. At the level of the Department of Education, the Integrated Education Management System allows global management of education in Krakow. Synthetic cross-section reports prepared by the system provide the basis to plan the city's strategy with regard to education. The system consists of six modules:
  - Organisational Sheet module – provides support in the preparation of organisational plans for preschools, primary schools, middle schools, high schools, high schools complexes, schools integrating disabled and able-bodied pupils, and vocational schools, as well as special needs schools.
  - Staff and Payroll module – collects personnel data and facilitates HR management, generating payroll and its distribution. The module comprises two applications: Staff Registry and Payroll. The Staff Registry application contains a register of personal data of the employees and persons employed pursuant to civil-law agreements (mandate contracts and specific work contracts). The Payroll application is used for generating payrolls on the basis of data entered into the Staff Registry and data supplemented with regard to employee allowances and deductions (functional and special allowances, bonuses, and other allowances, pursuant to the appropriate by-laws, as well as personal deductions).
  - Finance module – the module allows recording the financial aspect of the operations of the budget unit, pursuant to the current accounting principles. The module consists of six applications: Planning and Budget, Assets, Warehouse Management, Sales, Receivables and Liabilities, and General Ledger. The Planning and Budget application is intended to be used for preparing planning sheets, and subsequently, on the basis thereof, preparing the designs of financial plans of educational institutions and the education budget plan, for introducing changes to the financial plan, within specific competences, and ongoing monitoring and analysis of changes introduced to the financial plans and the education budget plan. The Assets application handles operations related to managing tangible fixed assets, intangible fixed assets, and equipment. The application allows for registering purchased or received assets, prepares amortisation and depreciation plans, and calculates amortisation and depreciation for each individual year. All assets are assigned to the appropriate cost centre, which greatly facilitates planning and budget performance analysis. The Warehouse Management application is intended to provide support for warehouse operation, maintaining quantity- and value-

related registers of goods, and to facilitate control over stock availability. The Sales application allows the creation, registration, and archiving of documents related to sales, e.g. domestic sales invoices, corrective invoices, and other invoices. The Receivables and Liabilities application allows the registration of documents stating the formation, change, or expiry of liabilities or receivables. The application cooperates with other applications, such as the Central Contractor Index – through collecting contractor data, or the Central System Dictionary – through collecting bank data, which contributes greatly to improving the speed and ease of work, as well as to reducing the risk of mistakes. The data is entered only once, in one field. The General Ledger application allows for automatic control of the correctness of accounting operations, and for ongoing monitoring and analysis of the degree of performance of the financial plans in individual accounting periods.

- General Database module – collects comprehensive data on educational institutions, ranging from address information, tax registration number (NIP), industry identification number (REGON), to the type of institution. The module contains data on real estate (including area, number of rooms, types of rooms), contracts executed by the institutions, renovation needs, methods of heating, and facilities located within the premises of the institution.
- Students module – used for comprehensive data collection with regard to the students of schools and educational institutions operated by the Municipality of Krakow.
- Electronic Documents Circulation System module – intended to provide a means of fast and secure communication between the Department of Education and its subordinate institutions, as well as between institutions.

- Subsidies for Non-Public Institutions and Register of Non-Public Schools and Institutions (SNPI) – the SNPI application is web-based. The SNPI system is meant to be applied to collecting and storing the records of the register of non-public schools and institutions, as well as public schools and institutions operated by entities other than the city, and to calculating subsidies based on the data entered into the program by the subsidised entities. The intended users of the application are schools and institutions receiving subsidies, who each month, within the deadline pursuant to the resolution of the City Council, enter data on the number of children / students / wards necessary to determine the amount of the subsidy.

- Education Information System (EIS) includes educational databases which comprise collections of data from schools and local government and non-local-government institutions operating within the education system. Entities required to maintain educational databases deliver reports to the competent bodies maintaining the registries or creating entries thereto / issuing operation licences. Local government units and the appropriate ministers subsequently deliver the data from the educational databases maintained by them to, as appropriate, the superintendent or to the minister for education. The superintendents transfer the data from the educational databases maintained by them to the minister for education.

1.3.3. Tourism and Historic Monuments

8,150,000 visitors came to Krakow in 2010, and the number increased by 850,000 in comparison with the preceding year. 6,050,000 of those visitors came from Poland, and 2,100,000 came from abroad. Naturally, not all of those visitors are tourists: the city welcomed 4,050,00 tourists from Poland and 2,000,000 foreign tourists. During their time in Krakow in 2010, the visitors spent PLN 3,500,000,000, according to the results of the research conducted for the Krakow City Office by the Malopolska Tourist Organisation.

The research also shows that foreign visitors are most likely to arrive from Great Britain (26.17% of visitors; 28.74% in 2009). They are followed by Germans and Italians (with a clear increase from 5.53% to 9.08%). The numbers of visitors from France, Spain, USA, Ireland, Ukraine, Russia, and Slovakia grew as well.

The main purpose of travel is sightseeing, rest and relaxation, as well as visiting relatives or friends. The list also includes religious purposes, business, participation in cultural events, and in congresses, conventions, and training.

The scope of work of the Department of Information, Tourism and City Promotion includes matters related to the information policy, tourism, and the promotion of the city. The Department maintains a close cooperation with the Krakow Festival Office, in particular with regard to obtaining the necessary data and information for the purpose of preparing the appropriate opinions, positions, or projects.

The work of the Department of Information, Tourism and City Promotion has already been supported by the City Internet Platform (CIP) "Magic Krakow", available at www.krakow.pl, prior to the implementation of the Project. The CPI is a portal divided into five main sections, clearly presenting the tourism, investment, and cultural advantages of Krakow and providing information on the current events in the city (news, photo galleries, and videos). The platform is operating on the basis of a database system (PHP, Oracle, SQL), contains static pages, and uses the JavaScript and AJAX technology. Within the portal, which is operated by the Chancellery of the Mayor, the websites of individual departments and sections are independently edited by the authorised office employees. Additional independent portals operated by the Krakow City Office are connected with "Magic Krakow", e.g. the Educational Portal of the City of Krakow (*Portal Edukacyjny Miasta Krakowa*), Clean Action (*Czysta Akcja*), SME Guide (*Informator dla Przedsiębiorców MSP*), European Guide (*Informator Europejski*), and many more.

Each of the above thematic fields of the Project, i.e. **Investment Process**, **Education**, and **Tourism and Historic Monuments**, requires **geographical data** support. The **Municipal Geographical Information System** (**MGIS**) used at the Krakow City Office integrates the data created and collected by the office, in particular geographical data. The data is imported to the MGIS and delivered to the data repository in the GeoMedia format. Processing of imported data, creation of new geographical data, and presentation of data at workstations are all conducted using the GeoMedia and GeoMedia Pro tools developed by Intergraph and applications running in the GeoMedia environment. Reconciled geographical data contained in the MGIS repository may be presented at the KCO workstations via a desktop browser using the GeoMedia graphic environment.

Geographical data processed for that purpose is recorded in the MGIS data repository as approx. 4,000 information layers. The MGIS system is modular. Its functionality should be therefore viewed as the functionality of individual system modules, while at the same time the individual system modules are utilised by various users.

The MGIS Viewer application, a dedicated piece of software and an integral part of MGIS, allows to present user-selected data as a map in a chosen scale, as well as to display object attributes. The user is granted certain freedom in terms of selecting the graphic and colour configuration. At the user's disposal are simple operations handling the display of the presented data.

Prior to the implementation of the Project: "Construction and Implementation of a Dedicated IT System for the Provision of Modern Local Government Administration Services in Krakow" there was no possibility of presenting, updating, and analysing MGIS data through a web browser, and therefore potential investors, external clients (including the residents of Krakow), and potential tourists had no way of accessing the data.

1.4. Description of Project Partners

1.4.1. The Municipality of Bærum (Norway)

The Municipality of Bærum covers an area of 191.3 km², of which 107.5 km² is covered by forests, and 2.9 km² – by lakes and rivers. It is located in the Akershus County, 15 km south-west of Norway's capital, Oslo. The municipality has approximately 110,000 residents, which represents about 21% of the county's entire population.

Its highest point is Vidvangen, at 552 m AMSL.

The capital of the Municipality of Bærum is the town of Sandvika, which was granted town status in 2003 and continues to be the centre of the municipality's cultural life and economy. The stretch of highway E18 that runs right through Bærum is the country's busiest route.

Bærum is said to be "Norway in miniature," since the municipality's landscape reflects all of the characteristic features of the country. A slew of islands and charming communities are located in the area. Magnificent beaches and fjords, along with picturesque, sunny hills, and deep forests make Bærum the ideal place for peace and relaxation for the great numbers of tourists that come to visit the region. Bærum's particular climate and conditions favour the development of the artistic community: a number of famous Norwegian painters lived and worked there.

Bærum's economy is rooted mostly in the industry, water transport, trade, and the services sector. Small and medium enterprises are the majority. In Norway, Bærum is famed for its burned lime, a tradition dating back to the 16th century, and for its iron ore mines (the first forge was founded in 1780 and is still in operation).

The Municipal Council is Bærum's highest authority. Its 51 members are elected every four years by the municipality's residents. The Council oversees the work of the Executive Committee, a group of 13 people elected by the Council from among its members. The Executive Committee is divided into two smaller committees: the Planning and Environment Committee and the Procedures Committee. The Mayor and the Deputy Mayor are elected from among the members of the Executive Committee. The Mayor chairs the meetings of the Municipal Council and the Executive Committee and is the legal representative of the Municipality. Moreover, the Mayor supervises the Control Committee and the Complaints Commission. The Council also appoints three sub-committees: the Children and Young Persons Sub-Committee, Aid and Care Sub-Committee and the Living Conditions Sub-Committee. The committees and sub-committees are managed by commissioners. The authorities are supported by the Executive Committee Office, which fulfils the functions of a secretariat and maintains the entire documentations related to the administrative operations of the municipal government.

More information is available at https://www.baerum.kommune.no

Photograph 3 The Bærum Town Hall

Source: Author – Zdzisław Wolak

1.4.2. The Krakow County

The Krakow County is situated in the north-west part of Lesser Poland (*Malopolska*), in the direct vicinity of Krakow (a city with county rights and the capital of the province). It belongs to four physical and geographical macro-regions: the Silesian-Krakow Upland, the Lesser Poland Upland, the Northern Carpathian Foothills, and the Western Carpathians, which affects the diversity of the climate and the environment in the area.

The county's location is to an extent defined by the vital domestic and international communication routes that cut across it:

- Krakow – Warsaw,
- Wroclaw – Katowice – Krakow – Tarnów – Przemyśl,
- Krakow – Chyżne/Zakopane,
- Krakow – Dąbrowa Górnicza,
- Poland's first toll highway: Krakow – Katowice, and
- east-west and north-south railways crucial for the country's economy.

Two airports are located in the county:

- John Paul II International Airport in Balice (Municipality of Zabierzów), Poland's second largest airport in terms of passenger traffic,
- sports airport of the Krakow Aero-Club in Pobiednik, the Municipality of Igołomia-Wawrzeńczyce.

The Krakow County boasts a significant area in relation to the area of the province (1,231 km²) and second largest population (approx. 246,000 residents). The county comprises:

- urban and rural municipalities: Krzeszowice, Skała, Skawina, Słomniki, and Świątniki Górne,
- rural municipalities: Czernichów, Igołomia-Wawrzyńczyce, Iwanowice, Jerzmanowice-Przeginia, Kocmyrzów-Luborzyca, Liszki, Michałowice, Mogilany, Sułoszowa, Wielka Wieś, Zabierzów, and Zielonki,
- towns: Krzeszowice, Skała, Skawina, Słomniki, and Świątniki Górne.

The Krakow County includes some unique natural assets. Protected areas account for approximately 30% of the county's area. The Ojców National Park and the Jurassic Landscape Parks (the Dłubnia, Tenczynek, Rudno, and Bielany-Tyniec parks, and the Krakow Valleys Landscape Park) are notable for their exquisite wealth of the flora and fauna, their dramatic composition, and the picturesque landscape.

Furthermore, due to the region's rich history and tradition, there are a number of historic castles, manors, palaces, and other attractive tourist destinations scattered throughout the area.

More information is available at https://www.powiat.krakow.pl

Photograph 4 The Cudgel of Hercules

Source: Author – Robert Cieślik

1.4.3. The Wieliczka County

The Wieliczka County is located in the southern part of Poland, in the Malopolska Province. The seat of the county authorities is the town of Wieliczka.

National routes 4 and 75 (33 km), as well as province routes 964, 966, and 967 (70.9 km) traverse the county. Convenient traffic solutions are ensured by over 236 km of county roads and 552 km of municipal roads. An additional communicational advantage of the county is the main railway line Krakow-Medyka, which runs through the municipalities of Wieliczka, Niepołomice, and Kłaj.

The county's area is 409 km², ranking it as the 15th largest among the Krakow Province's 22 counties. The population of the county is 104,477, with nearly half of the residents living in the Municipality of Wieliczka. The county comprises:

- urban and rural municipalities: Wieliczka, and Niepołomice,
- rural municipalities: Biskupice, Gdów, and Kłaj,
- towns: Wieliczka, and Niepołomice.

The county's tourist attractiveness is owed largely to its landscape qualities. However, the biggest draw in Wieliczka is the salt mine, which is visited annually by more than 1,000,000 people. A lot of tourists also seek to visit the Renaissance Royal Castle in Niepołomice, nicknamed "The Little Wawel," a former royal retreat. The reserve in the nearby Niepołomice Forest, located for the most part within the Municipality of Kłaj, is the home of "the king of the woods," the wisent (European bison). There are approximately 30 of the animals living within an area of 56 ha. The forest has also several other interesting nature reserves.

More information is available at http://www.wieliczka.pl

Photograph 5 The Wieliczka Salt Mine

Source: Author – Rafał Stachurski

2. Results of the Project – Description of Its Products in the Context of the Thematic Fields of the Project

2.1. Investment Process

2.1.1. Investor Portal

Investors are one group of people who have the chance to significantly influence the city's development, thus, creating appropriate conditions for them to benefit from is one of the core tasks of the city authorities. The fact that the Krakow City Office (KCO) is open to the needs of this group contributes greatly to the increase in the economic activity in the city and improvement of the quality of life.

One of the elements responsible for what is known as "favourable investment climate" is the ability to file applications electronically and for the relevant parties to conduct on-line tracking of the status of cases settled by the offices. Actions undertaken by the KCO ought to be aimed at increasing the number of cases available for settling on-line and at increasing the availability of this solution. It should be assumed that the number of cases handled on-line will only increase.

Analysis of the requirements specified in the Feasibility Study for the Project: "Construction and Implementation of a Dedicated IT System for the Provision of Modern Local Government Administration Services in Krakow" regarding the **investment process** made it possible to determine the detailed technological and functional requirements for the future new product dedicated to handling the investment process at the Municipality of Krakow (MK), referred to as the **Investor Portal**. The portal, available at **pi.um.krakow.pl**, is meant to serve as a guide for investors and is integrated with e-PUAP services.

The portal fulfils the following **objectives**:

- support for the investor's decisions during the investment process,
- providing investor with the possibility to, as part of e-PUAP services, file an electronic application, sign it with a secure electronic signature, and pay the required fees,
- quick feedback to the investor,
- minimising the number of the investor's visits to the territorial local government unit offices,
- shortening the duration of the investment process by means of computerising it (minimising actions duplicated in individual stages of the investment process, such as providing one's personal data several times; transferring information in electronic form).

Two functional areas have been defined as part of the Investor Portal, i.e. Investor Services and Clerk Services.

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Investor Services

The Investor Portal is aimed at external users (investors) and is a system of providing decision support in terms of guiding the investors through the investment process, in a way that consists of suggesting the successive steps in the process and the relevant investment procedures, at the same time providing, at minimum, support with regard to:

- indicating elements necessary for the completion of the current stage, as well as determining the feasibility and necessity of the stage in the context of the investment process,
- indicating the manner of obtaining the documentation necessary to complete the current stage of the process,
- indicating the probable subsequent course of action along with determining the expected costs and time necessary to complete the investment process,
- enabling attaching to the application of the documents that are already in the possession of the Krakow City Office and are related to the current investment process (entered into the system).

Each user of the portal (investor) is provided with the capability of initiating several investment processes at any one time. Upon initiating an investment process, the user (investor) will be guided by the Investor Portal through the successive steps in which, in the process of answering successive questions, the system will suggest a way of completing the individual investment procedures, supplemented in each stage with information important in the context of the investment.

The decision support mechanism provides the investor with the full set of information facilitating the obtaining of appropriate decisions, permits, licences, etc. at every stage of the investment process. Additionally, from within a given stage, the investor is able to access the Public Information Bulletin of the Krakow City Office in order to obtain the appropriate information concerning the investment procedure and to move on to the appropriate electronic application form in the e-PUAP platform. Filing an electronic application for the Krakow City Office at the Investor Portal will be therefore construed as completing the electronic application form under the e-PUAP service.

Due to the long duration of the investment process, the system saves the current states of the ongoing investment processes, assigning them to the appropriate user. On the other hand, each user is able to log onto the Investor Portal at any point of the investment process, and track and resume the initiated investment processes.

Following registration at the portal, every investor is therefore able to review their ongoing investment processes, verify the current status of a given process for each of them, and obtain detailed information on the subsequent steps, as well as conduct the appropriate procedures for each selected step.

The completion of each step is made possible due to integrating the portal with the e-PUAP services and integrating the user account in the portal with the e-PUAP user account. Thanks to such integration, it is possible to:

- file an electronic application,
- submit a secure electronic signature,
- pay a fee,

- present the submitted application in graphical form,
- access documents filed in the office's mailbox.

Filing an electronic application with the Investor Portal is construed as using the e-PUAP service by means of completing an appropriate form and filing it electronically (if permitted by law). Otherwise, filing an electronic application will result in summons to supplement the documentation or in rejection of the application due to defects of formal nature.

Listed below are procedures that have been implemented as services for the investment process:

AU-1 – Determining the conditions for land development,

AU-2 – Transfer of the decisions on determining the conditions for land development to another investor,

AU-3 – Determining the location of a public purpose investment,

AU-4 – Building permit, changes to the building permit,

AU-5 – Transfer of a building permit to another investor,

AU-6 – Structure demolition permit,

AU-7 – Issuing the construction/demolition logbook,

AU-8 – Consent to design exception,

AU-9 – Decision on the necessity of entering an adjacent building, premise, or real estate,

AU-10 – Construction registration – completion of work,

AU-11 – Structure demolition registration,

AU-12 – Registration of changes in the manner of usage of the structure or part thereof,

AU-13 – Certificate of premise separation (for residential and other premises),

AU-14 – Construction permit for a structure damaged as a result of exposure to the elements,

AU-15 – Demolition permit for a structure damaged as a result of exposure to the elements,

AU-16 – Registration of reconstruction of a structure damaged as a result of exposure to the elements

AU-17 – Registration of demolition of a structure damaged as a result of exposure to the elements

BP-3 – Issuing extracts and map extracts from local zoning plans; issuing extracts and map extracts from land use plans,

BP-4 – Certification on the intended use of land pursuant to the local zoning plan or zoning guidelines in land use plans,

GD-2 – Providing access to certified copies of master maps,

GD-12 – Assigning an ordinal number to a building,

GD-13 – Issuing certificates on the location of a building,

GD-19 – Issuing excerpts and map excerpts from a land register survey and copies from cadastral maps,

GD-21 – Providing access to land register survey data,

GD-28 – Coordinating the location of the planned utility networks,

WS-5 – Decision on transferring the decision on environmental constraints to another entity,

WS-8 – Issuing waste collection permits,

WS-9 – Issuing permits for utilisation or disposal of waste,

WS-11 – Issuing an integrated permit for the operation of an installation the functioning of which, due to the type and scale of the conducted activity, may cause significant pollution of individual natural elements or of the environment as a whole,

WS-15 – Issuing waste collection and transportation permits,

WS-19 – Approval with regard to environmental protection – vegetation protection,

WS-20 – Permit for the removal of trees or shrubs, removed in connection with an investment executed by legal entities and other organisational units and natural persons for purposes related to the operation of a business – with the exception of investments related to the construction or reconstruction of roads,

WS-21 – Permit for the removal of trees or shrubs, removed in connection with an investment executed by legal entities and other organisational units and natural persons for reasons not related to the operation of a business,

WS-22 – Permit for the removal of trees or shrubs in connection with reconstruction of public roads and railways or the construction of public roads; not applicable to trees and shrubs removed from real estate covered by a permit to execute a road-related investment,

WS-23 – Permit for the removal of trees or shrubs in connection with the modernisation of a utility network,

WS-56 – Decision on environmental constraints for a planned investment with a possible permanent significant impact on the environment,

WS-57 – Decision on environmental constraints for a planned investment with a possible permanent significant impact on the environment in case of an application to determine the scope of report,

WS-58 – Decision on environmental constraints for a planned investment with a potentially significant impact on the environment,

WS-62 – Registration of use of an installation, the emissions from which require no permit, that may have an adverse impact on the environment – an on-site wastewater treatment plant,

WS-66 – Accepting registration from contractors of geological works seeking to commence geological works,

WS-86 – Approving plans of geological works the performance of which requires no licence,

WS-71 – Permit required by the Water Management Act for a special use of water,

WS-72 – Permit required by the Water Management Act for regulating water and for changes to topography in areas adjacent to water which influences the conditions of water flow,

WS-73 – Permit required by the Water Management Act for installation of water facilities,

WS-75 – Permit required by the Water Management Act for long-term lowering of the water table, raising of the water table, drainage of construction structures or excavations if the range of the depression hole exceeds the border of the plot owned by the entity, and drainage of mining plants,

WS-76 – Permit required by the Water Management Act for storage of waste and wastewater within the limits of mining areas created for therapeutic waters,

WS-82 – Decision on legalising a water facility and determining the legalisation fee,

WS-83 – Permit required by the Water Management Act for the introduction to wastewater facilities owned by other entities, industrial wastewater containing substances particularly harmful for the water environment,

WS-84 – Registration of use of an installation that may have an adverse impact on the environment but produces into the atmosphere no gas and dust emissions that require a permit,

WS-85 – Issuing permits for emitting gases or dust into the atmosphere,

WS-90 – Accepting registration of plans of geological works concerning the use of geothermal energy,

WS-91 – Providing access to geological information, the rights to which are held by the State Treasury, but which are subject to use free of charge,

WS-92 – Approval, without reservations, of geological documentation and changes thereto,

WS-94 – Compensation proceedings – issuing permits for emitting gases or dust into the atmosphere by a newly-constructed or significantly changed installation, located within an area where air quality standards have been exceeded,

WS-101 – Determining the shore line for water, excluding inland waterways,

WS-112 – Accepting other geological documentation,

WS-113 – Issuing permits for waste generation if the waste-generating entity produces, in connection with the use of the installation, over 1 Mg of hazardous substances per year or over 5,000 Mg of non-hazardous waste per year, including utilisation, disposal, collection, or transportation of waste,

WS-114 – Issuing permits for utilisation or disposal and collection or transportation of waste,

WS-115 – Issuing a decision approving the hazardous waste management program of a waste-generating entities who produces over 0.1 Mg of hazardous substances per year including utilisation, disposal, collection, or transportation of waste.

The above procedures may be divided into procedures directly present in the flow of the investment process and procedures occurring optionally or independently.

Within the provision of its core services, the portal also enables the users to receive and store the following documents:

- Electronic Payment Confirmation (EPC),
- Official Confirmation of Submission (OCS),
- Official Confirmation of Delivery (OCD).

The Investor Portal is also integrated with the Public Information Bulletin of the Krakow City Office, ensuring the timeliness of the information concerning investment procedures. The integration is executed by means of a mechanism of links to the appropriate pages of the Public Information Bulletin of the Krakow City Office, where the investor may move to learn the details of the contents of the chosen procedure.

Clerk Services

The Investor Portal for internal users is a system allowing to manage services within the investment process and to communicate with the investors. The clerks can define the course of the investment process, connect individual steps of the process and the appropriate services, and during the course of the investment processes, they can communicate with the investors.

The key functionalities for a clerk include:

- *Managing the investment process,*
- *Managing the services catalogue,*
- *Communication,*
- *Announcements.*

Functionality: Managing the investment process

Upon logging in the Investor's Guide portal, a clerk is able to create a process definition. Each process definition is characterised by a name, the number of steps, and whether or not it is versioned. Versioning allows settlement of an investment at a given time in the manner specified in the version of the process applicable at that time. The definition of the investment process created in this manner provides the investor with hints on how to conduct the investment process.

Functionality: Steps

The key element of every process is a step, which represents completion of an actual given stage of the investment. In the case of the Investor's Guide portal, there are three types of steps:

Start – the step initiating the process. No input, but outputs can be specified for the subsequent steps.

Step – the actual step, i.e. the execution of an actual given stage of investment. Inputs can be defined within the step through connecting with outputs of previous steps, the decision route can be modelled, services can be connected, and subsequently outputs leading to the next steps of the process can be defined.

End – the step completing the process. No output, but input needs to be specified for the step by means of connecting it with the outputs of preceding steps.

Functionality: Versioning

Each process definition in the Investors Portal is versioned. As a result, each saved modification of the process definition that influences the course of the process creates a new version of the process. This allows each investment initiated by the investor to proceed along a scheme that is applicable at a given time.

The portal enables the clerk to review previous process versions, as well as to return to a version different from the current version, if necessary.

Functionality: Managing the services catalogue

Along with the investment process, the clerk is able to define the services that apply directly to the investment procedures. Each services is connected to information on the procedure, published in the PIB and linked to an e-PUAP form, which makes it possible for an investor to file an electronic application.

The services catalogue is also a list of services that the investor may review, and that allows them to acquaint themselves with the current possibilities of settling investment cases at the Krakow City Office.

Functionality: Communication

The Investor's Guide portal allows the clerk to handle communication in relation to the investment process, that is:

- to integrate the account of the clerk in the portal with the City Office's mailbox in the e-PUAP system, and therefore to access the documents filed by the investors in the office's e-PUAP mailbox;
- to prepare correspondence for investors and deliver it to the applicants' mailboxes in the e-PUAP system;
- to send serial correspondence to multiple recipients at e-PUAP mailbox addresses, and as a part thereof, to automatically suggest the address of the recipient's e-PUAP mailbox in the course of preparing the correspondence (suggesting investor details);
- to record the sending of correspondence in the outgoing correspondence register through providing access to integration interface with the selected circulation of documents for which the register is in place.

A clerk logging onto the portal is able to review documents sent to the mailbox of the Krakow City Office, to prepare communication with regard to the selected document or a group of documents (mass correspondence).

The Investor's Guide portal is also integrated with one of the selected document circulations at the Krakow City Office concerning the registration of incoming and outgoing correspondence. This function allows to record sending correspondence in the register of incoming and outgoing correspondence, which in turn makes it possible to maintain consistency of documents sent by the office.

Functionality: Announcements

Along with the other functionalities, at the clerk's disposal is the ability to inform investors of important matters related to the investment process. The Investor Portal provides the capability to create announcements visible to investors. Every such announcement possesses content, a title, and is optionally also assigned a validity date.

The current provisions of the law prohibit the full use of the functionality of the Investor Portal. The current provisions of legal acts (including the Construction Law, the Water Management Law, and the Geological and Mining Law) applicable to the investment process often disallow conducting procedures on-line. This is usually related to the requirements of attaching sizeable documents / attachments in paper form, often in multiple copies.

In the light of that, the creation of the Investor Portal is a step ahead of the upcoming legislative changes. Following the planned amendment of the acts related to the investment process, the Krakow City Office will already have had at its disposal a tool that allows to conduct the investment project entirely on-line.

The core user and content administrator of the product is the Department of Strategy and Development, whose duties include strategic planning, financial and investment planning, preparing analyses and prognoses for the city's development, drafting investment offers, coordinating tasks related to the formation of the Krakow Metropolitan Area, coordinating revitalisation programs, supporting the development of businesses, providing services to investors, promoting the city's economy, forming Krakow's brand-building program, and coordinating social communication procedures. The product is targeted **at individuals and legal entities** interested in **conducting business operations** within the territory of the **Municipality of Krakow**. The product will be used by organisational units whose administrative procedures are included in the investment process, i.e. the Spatial Planning Bureau, the Department of Architecture and Urban Planning, the Department of Geodesy, and the Department of Environmental Management.

2.2. Education

2.2.1. Education Data Warehouse

Analysis of the requirements specified in the Feasibility Study for the Project: "Construction and Implementation of a Dedicated IT System for the Provision of Modern Local Government Administration Services in Krakow" regarding the field of **education** made it possible to determine the detailed technological and functional requirements for the future product dedicated to supporting the work of the Department of Education of the Krakow City Office, which is referred to as the **Education Data Warehouse (EDW).**

EDW is a comprehensive solution for processing data from various sources and providing access to the aggregated data for statistical purposes. The **objective** of the system is to:

- provide statistical information to the employees of the Department of Education of the Krakow City Office (KCO),
- allow building of advanced lists and reports on the basis of data collected in the warehouse,
- support the employees of the Krakow City Office in making decisions related to institutions under their supervision.

The data warehouse system consists essentially of two elements, divided further into modules:

- data warehouse server, including:
  - data collection module,
  - warehouse database module,
  - OLAP module,
  - reporting module,
- report application.

The mechanics of the system is provided by the data warehouse server. The report application, on the other hand, is used to manage reports. The application is available via a web browser.

The following user functions can be currently listed for the system:

- Clerk,
- EDW Administrator,
- External User (e.g. the headmaster of an educational institution under the supervision of the KCO).

The "Clerk" function is meant for users of the report application who initiate reports. "External Users" are granted access to the same application, but may only view the generated results of reports and not initiate reports themselves. Whether or not the results of a report are made available is decided by the clerk initiating the report. "EDW Administrators" are users with access to both sections of the system. They manage the report application and have full access to the data warehouse server.

Data warehouse server

The data warehouse server is a server set-up used as the basis for the functionalities of the data warehouse that are related to the collection and processing of data. The server also features the service of creating and initiating reports, used by the report browsing application.

Input data

The data warehouse collects and aggregates data from various source systems. Due to the logic of their storage, their source and manner of collection, the data is divided into sets:

- **Organisational sheets data** – the source of this set of data is the Organisational Sheet module of the Integrated Education Management System,
- **General IEMS data** – set of data from the General Database Module of the Integrated Education Management System,
- **General EP data** – set of data from the Educational Platform application,
- **Data on residents** – this set includes data on school-age residents collected from the ELUD system (internal system of the KCO),
- **Financial data** – set of data related to local government educational institutions, collected from Finance module of the Integrated Education Management System,
- **Data on non-local-government institutions** – set of data on non-local-government institutions collected from the SNPI application.

Data collection module

This element of the system is responsible for communicating with the source systems on behalf of the EDW. Data will be collected for the warehouse through this module.

Source data will be collected from several systems operating within the Department of Education of the KCO:

- the Integrated Education Management System,
- the Educational Platform system,
- the General Records system,
- the SNPI system.

The warehouse server's access to the above systems takes place through the appropriate data access interfaces based on the definition of source data. Data collected from the source systems will be saved in the warehouse, using a structure that will allow for them to be time-stamped.

OLAP module

A part of the product was the preparation of a ten-dimensional OLAP cube (multidimensional database) used in the reporting system. Processing data for the purposes of these structures allows for faster access to data and faster creation of advanced data aggregating lists.

Reporting module

The reporting module of the data warehouse server is created based on Microsoft SQL Server 2008 R2 Reporting Services. Utilising this tool allows to create comprehensive reports with various visualisation forms.

As part of the implementation of the data warehouse system, ten reports based on the data collected in the warehouse were created:

Report 1: Number of students by level of education

Report 2: Dynamic of changes in the number of students

Report 3: Number of students by district

Report 4: Students – demography

Report 5: Number of students by age and type of institution

Report 6: Number of students by age and type of institution (non-local-government institutions)

Report 7: Teaching staff vacancies

Report 8: Administration and support staff vacancies

Report 9: Statement of expenses

Report 10: Statement of income

Report application

The function of a report application is fulfilled by the IntraDOK.Net document circulation system. IntraDOK.Net is an application used in the KCO, with a user interface available via a web browser. The application has been adjusted to suit the needs of the KCO and enhanced with the "Reports" module for the user and the application administrator. IntraDOK.Net possess a mechanism to access the data repository server and the reporting functionality of the server, and as a result the abovementioned modules make it possible to view and manage reports.

The application allows the user to:
- initiate a report,
- provide parameters for the report,
- filer the report,
- export the results of the report and save the generated file off-line; available formats include:
  - XML files,
  - CSV files,
  - TIFF images,
  - PDF files,
  - HTML files,
  - MS Excel (.xls) files,
- save the exported files as documents in the system,
- make the document containing the results available to External users.

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The Administrators can:

- create and manage report categories,
- add reports made available through the reports server,
- manage the report's attributes,
- define the report's parameters,
- manage the authorisations to initiate reports.

The core user and content administrator of the product is the **Department of Education**, whose duties include handling the **matters of preschools, primary school, middle schools, postsecondary education (including high schools, high school complexes, and vocational high schools), schools integrating disabled and able-bodied pupils, sports-oriented schools, special education schools, psychological and pedagogical counselling centres, and other schooling and education centres**, as well as monitoring the Economics of Education Team. Moreover, the product is directed at **municipal organisational units** interested in analytical data on education in the territory of the Municipality of Krakow.

2.3. Tourism and Historic Monuments

2.3.1. Tourist Portal

Analysis of the requirements specified in the Feasibility Study for the Project: "Construction and Implementation of a Dedicated IT System for the Provision of Modern Local Government Administration Services in Krakow" regarding the field of **tourism** made it possible to determine the detailed technological and functional requirements for the two future products dedicated to handling the field of tourism and historic monuments at the Municipality of Krakow, with the first product referred to as the **Tourist Portal**.

A part of this field was the creation of a dedicated portal available at **pt.um.krakow.pl** and targeted directly at entities operating in the tourism market. The portal fulfils three core objectives:

- informing representatives of the tourism industry of important events, undertakings, training, etc. through the publication of content on the portal and the sending of a newsletter,
- allowing the tourism industry to contact the City Office by means of a dedicated contact form,
- providing access to archive materials, important from a tourism standpoint.

The website was created as a content management system (CMS) published on-line and consistent with the City Internet Platform: Magical Krakow. The following modules were identified among the functionalities available on the Tourist Portal:

- *Content* (news, information, articles, etc.)
- *Newsletter*,
- *Contact form,*
- *Documents and data archive.*

Module: Content

The content management functionality allows to prepare and publish articles on the website, and each of such articles is assigned to the appropriate category.

Listed below are the categories of articles in the portal:

- Press releases,
- Events,
- Training,
- Conventions,
- Legal provisions,
- KCO procedures,
- Other.

Due to the particular nature of the Tourist Portal, all of the published content has the option of defining the types of representatives of the tourism industry to whom the information in question should be especially relevant. An attribute defined for the published content in this way facilitates grouping and displaying the information on the portal, providing the appropriate user with the option of accessing the chosen information faster.

In order to enable assigning types of representatives of the tourism industry to the published content, the Tourist Portal allowed its administrators to create and manage a dictionary of these types, hereinafter referred to as "profiles".

Listed below are the defined profiles of tourism industry representatives:

- Accommodation,
- Catering,
- Tour guides,
- Travel agencies,
- Carriers,
- Commerce,
- Tourist organisations,
- Museums,
- Publishers,
- Galleries,
- Artisans,
- Culture / entertainment / leisure,
- Car / recreational equipment rentals,
- Parking lots,
- Science institutions,
- Administrators of religious worship sites.

Apart from the ability to assign tourism industry representative profiles to the published content, upon registration at the Tourist Portal, a user will be able to define those profiles of the tourist industry that they deem to be of particular informational importance to them.

Module: Newsletter

The newsletter functionality meets three core requirements:

- sending information on the content published on the portal,
- sending information not published on the portal,
- archiving previously sent newsletters.

In the first instance, the editors and administrators of the portal have the option to prepare the newsletter based on selected published content, with the ability to specify the subject of the message, include a short form of content with a link to the full version in the portal, specify the date of sending, and define the recipients of the newsletter.

In the second instance, drafting a newsletter not related to the published content is possible in a form similar to the one defined above, except that the content of the newsletter is not connected to selected content published on the website.

In both instances, the author of the newsletter is able to define its recipients, choosing between the following two alternatives:

- "All" – the message is delivered to all users of the portal, regardless of industry profile,
- "Selected profiles" – in this case it will be possible to define, in a new window, the tourism industry profiles that should receive the message.

In the case of the newsletter archive, the Tourist Portal enables a logged-in user to browse and view newsletter by subject, content, date of sending, and tourism industry profiles.

Module: Contact form

The contact form functionality enables representatives of the tourism industry to contact the Krakow City Office. The form allows:

- to define the list of query subjects and linking the queries with the Krakow City Office mail accounts by an administrator,
- the user to select the subject during the editing of the content.

Listed below are the defined form query subjects:

- Press releases,
- Events,
- Training,
- Conventions,
- Legal,
- Procedures,
- Other (with the option of entering the subject).

The contact form is available exclusively to logged-in users; only the contact details of the Krakow City Office will be viewed by non-logged-in users. When editing the content of the message, the user is able to select the subject from the list. A list of subjects defined in such a way will allow the message sent by the user to reach the appropriate person at the Krakow City Office.

Module: Documents and data archive

The documents and data archive functionality allows to review digitised archival documents and photographs owned by the KCO. Each element of the archive posses a minimum of three attributes:

- category,
- date,
- text description (e.g. name of item, content-related description, and – for photographs – name of the author).

After entering the archive, the user will be able to review the materials by their categories or to search the materials by any combination of the three attributes (category, date, description).

Viewing the selected material consists of displaying the digitised archival document or photograph in a scaled version appropriate for displaying within the content of the website along with a superimposed watermark. Furthermore, a clause listing the legal consequences of unauthorised copying of the images is displayed below the image.

Selected users are additionally presented with a link to the original material available for download; whether or not the link is displayed will depend on the authorisation granted to the user:

- "non-registered user" – only the scaled image with a watermark will be visible,
- "registered user" – only the scaled image with a watermark will be visible,
- "registered authorised user" – the scaled image with a watermark and the link to the original content will be visible,
- "administrator" – as above.

In the case of downloads of the originals of the digitised archival materials and photographs, the portal shall register each such instance by means of recording the time and date of download, the user responsible for the download, and the name of the downloaded content. The portal will therefore enable the administrators to review a downloads report in the form of a table including the above information.

Listed below is the tree of categories for the archival materials:

- City Logbooks of:
  - the City Council,
  - the Assessor Court (Ława Sądowa),
  - City Rights admissions,
  - Accounting Ledgers,
  - Other;
- City maps:
  - 14th-16th century,
  - 17th century,
  - 18th century,
  - 19th century,
  - 20th century;
- Views of Krakow;
- Mayors of Krakow:
  - During the time of the Constitution of 3 May and the Kosciuszko Uprising (1792-1796),
  - Austrian Empire 1796-1809,
  - Duchy of Warsaw 1809-1815,
  - Republic of Krakow 1815-1846,
  - Austrian Empire 1846-1866/1867,
  - Austro-Hungarian Monarchy (Galician autonomy) 1866/1867-1918,
  - Second Polish Republic 1918-1939,
  - Republic of Poland 1945-1952,
  - People's Republic of Poland 1952-1989,
  - Third Polish Republic 1989-present;
- Photographs.

Upon launching, the Tourist Portal was provided with archival data, identified by the City Office as follows:

- Illustrations (plans and views of the city),
- Books,
- Administrators of the City of Krakow,
- Photographs.

The core user and content administrator of the product is the Department of Information, Tourism, and City Promotion, whose duties include the handling of matters of information policy, tourism, and promotion of the city. The Department works closely with the Krakow Festival Office, in particular with regard to obtaining the necessary data and information for the purpose of preparing the appropriate opinions, positions, or projects. The product is directed at **representatives of the tourism industry in the Municipality of Krakow**.

2.3.2 "Virtual Tour of Krakow"

Analysis of the requirements specified in the Feasibility Study for the Project: "Construction and Implementation of a Dedicated IT System for the Provision of Modern Local Government Administration Services in Krakow" regarding the field of **tourism** made it possible to determine the detailed technological and functional requirements for the two future products dedicated to handling the field of tourism and historic monuments at the Municipality of Krakow (MK), with the second product referred to as the "**Virtual Tour of Krakow**".

A part of this field was the creation of a dedicated "**Virtual Tour of Krakow**", a portal available on the City Internet Platform: Magical Krakow, at **wirtualnyspacer.krakow.pl**, and targeted directly at tourists, visitors, and the residents of Krakow. The portal fulfils three core **objectives**:

- promoting tourism in the City of Krakow,
- increasing the number of tourists visiting Krakow,
- creating a tool used for the presentation of virtual tours.

The "Virtual Tour of Krakow" includes four "walks" to be completed within a day:

- "The Old Town",
- "Kazimierz",
- "Podgórze",
- "The Planty".

The sites (i.e. spherical and cylindrical panoramas and details – photographs) visited during each "walk" include, respectively:

- "The Old Town" virtual walk includes:
    - the Pl. Matejki square,
    - the Barbican,
    - the City Walls,
    - the Arsenal,
    - St. Florian's Gate,
    - the Baszta Pasamoników tower,
    - the Baszta Ciesielska tower,
    - the Baszta Stolarska tower,
    - Ul. Floriańska street,
    - the Jama Michalika café,
    - Jan Matejko's house,
    - the Museum of Pharmacy,
    - the Pod Różą Hotel,
    - Church of St. John the Baptist and St. John the Evangelist, at ul. św. Jana 7,
    - Church of the Transfiguration (Piarist church), at ul. Pijarska 2,
    - Church of St. Mark at the corner of ul. Sławkowska and ul. św. Marka,
    - Church of St. Casimir the Prince (Reformed Fransiscans church), on ul. Reformacka,
    - the Pl. Szczepański square,
    - the Palace of Arts
    - the Bunker of Arts,
    - the Szołayski House,
    - the National Old Theatre,

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- – Collegium Maius,
- – Collegium Novum,
- – Church of St. Anne,
- – the Nowodworski College,
- – the Main Market Square,
- – the Cloth Hall,
- – the Town Hall Tower,
- – the Church of St. Adalbert,
- – the Adam Mickiewicz Monument,
- – Palace under the Rams,
- – the Basilica of the Assumption of the Blessed Virgin Mary (St. Mary's Basilica),
- – the Pl. Mariacki square,
- – Church of St. Barbara,
- – the Little Market Square,
- – the Szoberowski House,
- – the Pl. Św. Ducha square,
- – the Juliusz Słowacki Theatre,
- – Church of the Holy Cross,
- – Basilica of the Holy Trinity (Dominican church), at ul. Stolarska 12,
- – the Pl. Wszystkich Świętych square (mayors' monuments),
- – the Krakow City Office,
- – the Wyspiański Pavillion,
- – Basilica of St. Francis of Assisi (Franciscan church), at ul. Franciszkańska 2,
- – Ul. Grodzka street,
- – Pl. św. Marii Magdaleny square,
- – Church of Sts. Peter and Paul, at ul. Grodzka 54,
- – Church of St. Martin,
- – Church of St. Andrew,
- – Ul. Kanonicza street,
- – the City Walls gallery,
- – the Bishops' Palace with the "Papal" window,
- – ul. Kanonicza street, houses nos. 18, 19-21, 15,
- – Church of St. Bernardine (Observantist church), at ul. Bernardyńska 2,
- – Church of the Conversion of St. Paul (Vincentian church), at ul. Stradomska 4,
- – the Wawel Hill and the Castle,
- – the Wawel Castle courtyard,
- – the Cathedral Basilica of Sts. Stanislaus and Wenceslaus (the Wawel Cathedral),
- – Basilica of St. Florian (Church of St. Florian), on ul. Warszawska,
- – Church of the Visitation of the Blessed Virgin Mary (Carmelite church in Piasek),
- ▪ The "Kazimierz" virtual walk includes:
  - – Corpus Christi Basilica,
  - – Pl. Wolnica square,
  - – Ul. Krakowska street,
  - – Church of St. Catherine of Alexandria and St. Margaret,
  - – Church of St. Michael the Archangel and St. Stanislaus (Skałka church),

- Church of the Holy Trinity (Fatebenefratelli church),
- Fatebenefratelli Hospital,
- Museum of Municipal Engineering,
- Ul. Szeroka street,
- the Old Synagogue,
- the Izaak Synagogue,
- the Kupa Synagogue,
- the High Synagogue,
- the Tempel Synagogue,
- the Remuh Synagogue,
- Pl. Nowy square,
- the Remuh Jewish Cemetery,
- the New Jewish Cemetery,
- The "Podgórze" virtual walk includes:
  - the Laetus Bernatek Footbridge,
  - the Piłsudski Bridge,
  - Rynek Podgórski square,
  - Pl. Niepodległości square,
  - Sanctuary of Our Lady of Perpetual Help (Redemptorist church),
  - Bednarski Park,
  - the Krakus Mound,
  - Church of St. Joseph,
  - Pl. Bohaterów Getta square,
  - the Pod Orłem Pharmacy,
  - Oskar Schindler's Enamelware Factory,
  - Museum of Contemporary Art,
  - Site of the Płaszów concentration camp,
- "The Planty" virtual walk includes:
  - Starting at St. Florian's Gate – around the Old Town.

The "Virtual Tour of Krakow" also contains a night-time **gallery** of spherical and cylindrical panoramas of illuminated objects, and of the following:

- Three Poets Avenues:
  - the National Museum,
  - the Jagiellonian Library,
  - AGH University of Science and Technology,
- Ul. Kopernika street:
  - surgery clinic (white and red),
  - Church of Immaculate Conception of the Blessed Virgin Mary (St. Lazarus church),
  - Church of St. Teresa of Jesus and St. John of the Cross (church of Discalced Carmelite nuns),
  - the Botanical Garden,
- the Sanctuary of Divine Mercy,
- Polish Aviation Museum,
- the Central Square,
- the Aleja Róż avenue,
- Church of Blessed Virgin Mary Queen of Poland (Lord's Ark),
- the Administrative Centre of the steelworks,

- Church of St. Augustine and St. John the Baptist (church of Norbertine nuns),
- Chapel of St. Margaret and St. Judith (Church of St. Margaret),
- Church of St. Salvatore,
- St. Salvatore's Cemetery.

The total number of spherical and cylindrical panoramas prepared for the "Virtual Tour of Krakow" was approximately 860, with additional 500 details, i.e. photographs of selected sites. Descriptions, written and read by lectors in the relevant language, are available in Polish, English, and Norwegian. Moreover, the portal has the following functionalities:

- a navigation map for the walks,
- GPS-based panoramas,
- search engine for panoramas and details,
- adding comments on the panoramas and photographs,
- website view counter.

The core user and content administrator of the product is the Department of Information, Tourism, and City Promotion. The product is directed at **tourists, visitors to the city, Internet users, and the residents of the Municipality of Krakow**.

2.4. The Municipal Geographical Information System Portal

The modern **Municipal Geographical Information System Portal** (MGIS portal) grants the residents of the city and other interested parties universal and stable access to the data resources of the MGIS. It was implemented and operates as a web-based technology and fulfils the goals of the Project: "Construction and Implementation of a Dedicated IT System for the Provision of Modern Local Government Administration Services in Krakow," in particular with regard to the handling of the investment process, the field of education, and promotion of tourism. The MGIS portal fulfils the following **objectives**:

- standardising the manner of obtaining and providing access to the geographical data of the Municipality of Krakow,
- provision of access to geographical data via web browsers,
- provision of access to information to a broad audience.

The portal allows to launch currently unavailable services, which are otherwise wide-spread in the Internet, and which will be available to interested parties 24/7. The MGIS portal supports the following fields in its presentation of geographical data:

- the investment process,
- education,
- tourism and historic monuments.

Informational support of the investment process

It is assumed that the investment process commences at the time of the purchase of a real estate and ends at the time of obtaining an occupancy permit. The informational scope for the presentation of the graphical MGIS portal – Investor Portal, supporting the investment process, and therefore also the Investor Portal, includes the following data layers:

- Land Register with arable lands layer,
- Address points,
- Property Register,
- Street borders and names,

- Underground utility networks,
- Land use plan,
- Decisions on conditions for land development and building permits,
- Master maps,
- Acoustic maps of the city,
- Tram lines,
- Registered and indexed historic monuments,
- Planned and ongoing strategic investments,
- Restricted areas,
- Areas included in a forest management plan,
- Actual vegetation,
- Orthophotomaps,
- Currently applicable local zoning plans.

Informational support of the education field

The informational scope for the presentation of the graphical MGIS portal – Education Portal, includes the following data layers:

- Property Register,
- Address points,
- Street borders and names,
- Tram lines,
- Nurseries,
- Preschools,
- Primary schools,
- Primary school districts,
- Middle schools,
- Middle school districts.

Informational support of the tourism field

The informational scope for the presentation of the graphical MGIS portal – Tourist Portal includes the following data layers:

- Property Register,
- Address points,
- Street borders and names,
- Tram lines,
- Railways,
- Tourist attractions,
- Tourist trails,
- Protected sites,
- Historic monuments.

Functionality of the MGIS portal – Investor Portal in the handling of the investment process

Introduction of web-based data access, an advanced functionality in terms of presentation of data and reports of geographical analyses (visualisations of answers to queries) as well as the creation of communication mechanisms ensures proper interaction, allowing the

users to maximise the utilisation of the data contained in the system, as well as to affect the content of the selected data of the MGIS portal.

The portal's functionality in that regard enables to:

- search for the investor's plot of land by its number or address,
- visualise the plot's surroundings with the option to view adjacent plots, street borders and names, tram lines, nearby buildings, available utilities,
- view of the plot against:
  - master map,
  - adjacent real estate for which development conditions decisions or building permits have been issued,
  - acoustic map,
  - actual vegetation map,
  - adjacent historic monuments,
  - planned and ongoing strategic investments,
  - restricted areas,
  - areas included in a forest management plan,
  - orthophotomaps,
  - georeference data obtained from other sources available for the portal.

The portal's functionality includes the options to:

- display the layers listed above in any configuration,
- navigation, displaying the coordinates of the cursor, measuring distance and area,
- for indicated objects or areas,
- printing the entire visualisation or a user-defined part thereof,
- downloading or importing data with regard to the visualisation using the current standard.

Functionality of the MGIS portal – Education Portal in the handling of tasks related to the field of education

The functionality of the MGIS portal – Education Portal handling matters related to education is dictated by the requirements of the Department of Education and of the residents and interested parties. The portal allows to:

- present, within the city, the following objects, including data prepared for informational purposes by the Department of Education or building administrators:
  - locations of nurseries,
  - locations of preschools,
  - locations of primary schools,
  - locations of middle schools,
  - locations of primary school districts,
  - locations of middle school districts,
- measure the distance between a user-selected address point and a selected educational facility,
- measure the distance one needs to travel between a user-selected address point and a selected educational facility (polygonal path measurement),
- present the selected category (nurseries, preschools, primary schools, or middle schools) along the path indicated by the user on the map,

- locate a facility or facilities meeting the conditions selected by the user in the search engine with the use of descriptive attributes of the facilities provided by the administrator of the Education database.

Educational facilities are presented against layers available in the MGIS: street borders, building outlines, tram lines.

Functionality of the MGIS portal – Tourist Portal in the handling of tasks related to the field of tourism and historic monuments

The functionality of the MGIS portal – Tourist Portal handling matters related to tourism and education is dictated by the requirements of the Department of Information, Tourism, and City Promotion, of the tourists, visitors to Krakow, and of the residents and other interested parties. The portal allows to:

- present, within the city, the following objects, including data prepared for informational purposes:
  - Property Register,
  - address points,
  - street borders and names,
  - tram lines,
  - railways,
  - tourist attractions,
  - tourist trails,
  - protected objects,
  - historic monuments,
- display the layers listed above in any configuration,
- measure the distance between a user-selected address point and a selected object,
- measure the distance one needs to travel between a user-selected address point and a selected object (polygonal path measurement),
- present the selected category along the path indicated by the user on the map,
- locate an object or objects meeting the conditions selected by the user in the search engine with the use of descriptive attributes of the facilities provided by the administrator of the database.

The core user and content administrator of the product are all units of the Krakow City Office. The product is directed **at tourists, visitors to the city, Internet users, and the residents of the Municipality of Krakow**.

3. Cooperation with the Municipality of Bærum

3.1. Description of Study Visits

3.1.1. First Study Visit to Norway

From 31 May 2010 to 2 June 2010, at the invitation of the Norwegian partner in the PL0439 Project, a Polish delegation visited the town of Sandvika located in the Municipality of Bærum, Norway.

The goal of the study visit, part of the Project financed using the funds of the European Economic Area Financial Mechanism, was to witness the functioning of the Norwegian IT systems supporting the servicing of residents of the Municipality of Bærum.

Pursuant to schedule of the visit, on 1 June 2010, the following presentations, dealing with the ICT solutions in place at the municipality, were given at the Bærum Town Hall:

- Project Performance Status – presentation of the Project Coordinator Przemysław Sekuła,
- IT – Infrastructure and the Strategic Tool of the Bærum Municipality Town Hall – presentation by the employees of the Municipality of Bærum,
- Bærum's IT Systems for Direct Communication with Residents and Clients: the Website of the Town Hall, the School System, the Preschool System, the Healthcare System, the Application Building System (Including Construction Applications), Web-Based Geoinformation – presentation by the employees of the Municipality of Bærum.

On 2 June 2010, representative of the Department of Information Technology described the ICT projects management system in place at the Municipality of Bærum. The delegates subsequently met with the Deputy Mayor of Bærum, Lisbeth Hammer Krog, and discussed the strategic plans for the development of the Municipality of Bærum.

Conclusions and tasks

The composition of the Krakow delegation, apart from the Krakow City Office employees, included Andrzej Nowicki, Director of the Municipal Database Management, and Przemysław Sekuła, Project Coordinator.

The top authorities of the Municipality of Bærum confirmed the necessity of executing organisational projects the products of which are IT tools supporting business processes. They also emphasised the need to construct a strategy for the development of the local community, and its strong ties to ICT technologies and to the national strategy for the development of a information and digital society (eGovernment).

Currently, the institutions of the Municipality of Bærum manage the entirety of the ICT infrastructure with the exceptions of the skeleton of the MAN network. Outsourcing solutions are becoming less frequently used due to the increasing expenses incurred by the municipality. All elements related to the management of preschool, primary, and post-primary education within the Municipality of Bærum are covered by IT support. National Digital Tests and Digital Exams are carried out in the education sector. The students' grades and absences are recorded digitally. The goal of the Municipality of Bærum is to

ensure one computer per one secondary school student and one computer per two or three primary school pupils (including access to all the necessary applications).

The basis of tourism promotion is the creation of thematic layers and tools made available by a common source, that is the website of the Municipality of Bærum, closely tied to GIS information.

The Geographical Information System contains all information necessary for the Municipality of Bærum to fulfil the tasks it is legally required to execute. The system was created based on the national norms (SOSI, Norway Digital and Kataster). It is updated regularly with the use of change management processes. The Municipality of Bærum considers openness and availability of information to be the vital principle of the operation of the GIS.

Tasks to be fulfilled by the KCO:

- updating the Strategy for the Municipality of Krakow and for the Krakow City Office with regard to the experiences of the Municipality of Bærum,
- development of the education management system using the elements presented by the Municipality of Bærum as part of the Project,
- updating the MGIS system with the elements presented by the Municipality of Bærum as part of the Project.

The expected benefits and results for the Municipality of Krakow

The goal of the visit was to witness the ICT solutions in place at the Municipality of Bærum with regard to investor support, educational solutions, and solutions for the tourism industry.

The solutions presented by the partner city made it possible to determine more details of the system implemented as part of the Project, which was especially important during the first stage of the actual execution of the relevant scope of the Project: the pre-implementation analysis. Knowledge gained during the visit contributed to a more detailed specification of the expectations with regard to the implemented solutions, which in turn made it possible to prepare a product better suited to the requirements of the final beneficiaries of the Project.

A so-called "soft" result of the Project is tightening of the cooperation between the persons responsible for the Project at the Krakow City Office and their counterparts at the Municipality of Bærum. The contacts allowed for further exchange of information, and in particular for obtaining support from Bærum at the stages of test launch and production launch of the system with regard to project management and the target architecture of the ICT solution.

3.1.2. Second Study Visit to Norway

From 16 February 2011 to 18 February 2011, at the invitation of the Norwegian partner in the PL0439 Project, the Polish delegation re-visited the town of Sandvika, located in the Municipality of Bærum, and Oslo, Norway.

The goal of the study visit, part of the Project financed using the funds of the European Economic Area Financial Mechanism, was to witness the functioning of the Norwegian IT

systems supporting the servicing of residents of the Municipality of Bærum and of Oslo (in the field of education and tourism).

Pursuant to the schedule, the course of the visit was as follows: on 17 February 2011 representatives of the department responsible for the field of tourism met with the employees of Innovation Norge, an entity holding the rights to the visitnorway.com brand.

The meeting took place in the company's offices. The Norwegian moderator of the meeting was Bjørn Krag Ingul. During the meeting, he presented the main areas of the company's operation, and then focussed his presentation on tourism. Innovation Norge has branches in every region of Norway and in several selected countries in the world, including Poland. Poles represent approximately 6% of the total number of tourists visiting Norway. The tourism offer is targeted mainly at the German, Danish, Swedish, Dutch, and British markets. Visitnorway.com operates, to a large extent, on the premise that Norway is a country almost unknown to the average European. The main focus of its campaigns is placed on the qualities of the region's landscapes. The tourism offer includes sightseeing in a country that puts great stock in the environment, and is fairly undiscovered and wild. Fjords, the Arctic Circle, or the far north are meant to draw tourists who primarily seek contact with nature. The offer is also directed to fans of winter sports.

Innovation Norge is a public institution owned by the Norwegian Ministry of Trade. Aside from tourism, its operations also include financing small, family businesses which, having met a number of specific conditions, are granted an environmental certificate.

The Polish delegation subsequently visited Visitoslo.com – an institution dealing with the tourist promotion of Oslo itself.

The meeting took place at the company's offices. The Norwegian moderator of the meeting was Katrine Mosfjeld. Visitoslo is a non-public organisation, financed with non-budgetary funds. Its core activities are the sales of tourism products, where "product" is understood as "information". Visitoslo prepares products with the motto "What, where, when". Its main theatre of operations is the Internet, in the form of Visitoslo's own website and intensive use of social media (Facebook, Twitter, Flickr), and its own YouTube channel. Visitoslo also maintains commercial cooperation with hotels. 95% of the city's hotels co-finance the institution, who in return provides access to information and runs an accommodation booking system on its website. Oslo has three tourist information points run by Visitoslo. Information on the city's attractions is also available in the trains of the Oslo – Gardenmoen Airport line.

Concurrently with the meeting between the representatives of the tourism industry in Olso, part of the delegation attended the meeting with the employees of the Municipality of Bærum responsible for the support of ICT solutions for the field of education.

The visit began with a meeting with the IKT Director of the Municipality of Bærum, Ms Siri Opheim. The topics of the discussion were the status of the implementation of the PL0439 Project and the risks currently present in the Project. Ms. Opheim presented the scope of operations of the IKT department. Later, the head of the unit responsible for the operation of the data processing centre at the Municipality of Bærum conducted a guided tour and discussed the core elements of the server room. He pointed out that all data should be secured in a manner that minimises the risk of loss of the data. This may be carried out by means of transporting a security copy outside of the main server building or through creating a back-up data processing centre.

The Polish delegation then visited the Ramstad school, where they were greeted by the headmistress, Ms. Susanne Kaaløy. During the meeting, the parties discussed on how IT systems support the work of the teachers and the students. Communication and interaction between the teacher, the student, and the parent is obligatory and fully supported by applications available on-line with the use of the SSL protocol. The following tasks are fulfilled through logging in to the system:

- for teachers – with regard to:
  - enforcing student attendance,
  - enforcing and verifying the students work in class,
  - enforcing and grading the tasks performed in class and homework,
  - grading revision tests,
  - notes on the students' behaviour,
- for students – with regard to:
  - work in class,
  - tasks performed in class and homework,
  - revision tests.

The parents, on the other hand, are able to check the attendance and results of work of their children at any time, and to view the grades and notes given by the teachers. During the meeting, the GIS system administered by the Municipality of Bærum was presented, and its functionality was illustrated with maps presenting the network of schools in the Municipality of Bærum.

An important and highlighted element was the centralisation and standardisation of applications supporting the work of the teachers, students, and parents throughout the municipality. The decision on which applications are to be used by the schools in all fields of their activity is made by the municipality. This allows for considerable savings and full control over the licences. The IT system for the municipality's schools has become a key element supporting the education of the youth.

Conclusions and tasks

With the goal of promoting the City of Krakow in mind, it is advisable for the Municipality of Krakow's websites to use and create mechanisms enabling other interested parties to publish on their websites, in a straightforward way, selected information from the websites of the City of Krakow which such parties consider relevant.

The meetings discussed above made it possible to gain experience in the functioning of the electronic education system in the Town and Municipality of Bærum. The visit to IKF enabled the delegation to familiarise themselves with the core purposes of the system, as well as its technological features and the manner of its practical use by the authorised officials. The visit to the school showcased the practical possibilities of utilising the system, its strengths and weaknesses.

The system provides all students, teachers, and parents, as well as the representatives of the Municipality of Bærum, with the ability to use it. The foundation of the system is providing schools with the appropriate numbers of computers which would allow every student attending a school to login onto the system.

The implementation and maintenance of the system requires providing the schools with a relatively large number of computer workstations: ultimately, these should be available to all students and teachers working at a given school.

The planned changes to the structure of the system, from decentralised to centralised, are said to be caused by the necessity of reducing the maintenance costs and assume reductions in the number of servers and transferring the servers to a single location administered by the municipality's authorities.

The implementation of the presented IT system in the full extent of its functionality is currently not possible at Krakow's local government schools due to the costs connected with equipping the schools with computer workstations available to the students in class. One element of the system that is already implemented in a number of schools in Krakow is the registration of attendance and grades for individual subjects and behaviour. This is performed by electronic registers which are, year over year, implemented in a growing number of local government education institutions.

Tasks to be fulfilled by the KCO:

- implementation of a video game promoting the Municipality of Krakow and publishing it through the CIP Magical Krakow; unit responsible: Department of Information, Tourism, and City Promotion,
- conducting an analysis of the possibility of creating a central IT system for the Municipality of Krakow, with the functionality of delegating competences; unit responsible: Department of Information Technology.

The expected benefits and results for the Municipality of Krakow

Witnessing the operation of an IT system handling education used in the Municipality of Bærum has made it possible to analyse in more detail the benefits of popularisation of electronic registers in school operated by the Municipality of Krakow.

Witnessing the operation of the GIS administered by the Municipality of Bærum has made it possible to analyse the possibility of implementing additional functionalities of the portal containing educational data created in the Municipality of Krakow as part of the Project: "Construction and Implementation of a Dedicated IT System for the Provision of Modern Local Government Administration Services in Krakow".

3.1.3. Conferences

In the course of implementation of Project PL0439: "Construction and Implementation of a Dedicated IT System for the Provision of Modern Local Government Administration Services in Krakow," the Mayor of Krakow, Jacek Majchrowski, held two conferences aimed at presenting to the visitors the development status of the Project.

The first conference took place on 25 January 2011 in the Stanisław Wyspiański Conference Room of the Krakow the City Council, and the representatives of the Krakow City Office and IT experts presented the objectives of the Project, ways of its implementation, as well as the resulting benefits. The experts discussed in detail the use of geographical data in public administration and the purposes of the dedicated IT system for the provision of modern local government administration services in Krakow, which is the subject of the Project. The conference included presentations of experts responsible for the individual stages of the Project and a presentation of an independent expert in e-administration, which is a discipline using ICT technologies for the purpose of streamlining the operations of public administration. E-administration is a continuous process of improving the quality of governing and of the provision of administration

services through transforming the internal and external relations using the Internet and other modern means of communication.

Photograph 6 Project Conference on 25 January 2011

Source: Author – Andrzej Kazimierski

The second conference took place on 14 April 2011 at the Historical Museum of Krakow at the Krzysztofory Palace, in the Fontana Room. During the conference, the speakers summed up the implementation of the entire Project and presented Project products created following its execution, that is:

- the Investor's Guide portal,
- the Educational Data Repository,
- the Municipal Geographical Information System Portal,
- the Tourist Portal,
- the Virtual Tour of Krakow.

Photograph 7 Project Conference on 14 April 2011

Source: Author – Andrzej Kazimierski

Participants of the conference included not only the management and employees of the Krakow City Office, but also representatives of the following: the Ministry of Foreign Affairs – Ms. Barbara Michałowska, the Ministry of Regional Development – Ms. Iwona Wendel, the Project's Steering Committee, Partner Cities, and representatives of large cities from the entire country as well as external companies carrying out the individual stages of the Project.

During both conferences, guests of honour were the representatives of the Municipality of Bærum, whose participation enabled them to acquaint themselves with the stages of the execution of the Project and with its final results. The City of Krakow was visited by: Ms. Lisbeth Hammer Krog, Deputy Mayor of the Town of Bærum, and employees of the Bærum Municipal Council: Mr. Marek Kotlarz, Mr. Kjell Berge, Ms. Anne-Mai Eriksen, and Ms. Inghild Andersen.

3.2. Solutions in Place in the Municipality of Bærum with Regard to the Computerisation of the Thematic Fields Covered by the Project: the Investment Process, Education, and Tourism

3.2.1. General

The Municipality of Bærum, with its capital in Sandvika, is among the largest in Norway. ICT is its strategic tool throughout the organisation and provides vital services to the residents. Adapting to social changes and changes in technology force the municipality to use, update, and verify strategic plans with regard to providing management support using ICT tools.

The new strategic plan, based on national strategic documents, was introduced in 2009. The chief reasons behind it included:

- new requests from the residents of the Municipality of Bærum,
- new national and governmental regulations, both legislative and executive,
- a growing number of residents, who will require new services,
- the cost-effectiveness of utilising ICT tools to support public services.

Through observing the guidelines set out in the national strategy plan (the national and governmental objectives, regulations, and local objectives and political regulations), the Municipality of Bærum hopes to achieve the following benefits:

- improvement of the service of residents with respect to public services,
- decreasing human resources with regard to performing menial tasks by assigning staff to more complex duties,
- streamlining communication, work, and office management.

On the basis of the above objectives, the Municipality of Bærum prepared a strategy plan for the municipality's development, named eBærum 2012 and covering the following thematic areas:

- Local democracy and participation in building community awareness,
- Efficient services for the community and businesses,
- Electronic interaction in the healthcare sector,
- Electronic interaction with the social services,
- ICT in primary and secondary education,
- Geoinformation,
- Electronic deliveries and invoices,
- Internal electronic integration and cooperation,
- ICT architecture and architectural systems,
- Architecture integration,
- Open standards – interoperability,
- Open source software,
- Data security and privacy protection,
- Broadband, communication, and telephony,
- Strategic ICT management,
- Ownership system,
- eCapability – building ICT competence,
- Joint public work and partnership in the local government.

3.2.2. Investment and Geographical Information

Investment Process

The Municipality of Bærum fulfils its obligation to issue building permits using a legally required ICT system made available to all the municipalities and residents of Norway. This system is named ByggSøk. ByggSøk is a project initiated in November 2000 at the request of the Norwegian Minister of Local Government and Regional Development and the Ministry of Environment.

ByggSøk is state-owned and managed and developed by the National Office of Building Technology and Administration. ByggSøk contributes to the popularisation of more effective processes of planning and creating applications and permits by making its services available on-line. The system can be used by a non-registered user and may be used for the electronic presentation of a project or of a plan to apply for a building permit. ByggSøk is free of charge for the users and for the local governments.

The applicant is guided through the investment process appropriate for a given case and is provided with aid on every stage of the process. When all the data is provided, the content is verified with regard to its substance and form. If the application is complete, it can be printed or sent to the local government electronically.

The system for filing applications related to the investment project was officially launched on 9 July 2003 by Erna Solberg, Minister of Local Government and Regional Development. In autumn of 2003, the local government began to accept applications submitted electronically through ByggSøk.

In 2011, a new version of the program was launched: ByggSøk 2010. The system now allows to fill out all necessary building permits. This means that the following applications can be submitted:

- Building permit application;

(All construction-related permits include, and are carried out in, two stages: the first is the building permit, the second is the construction work commencement permit. The building permit application is meant to result in the decision on whether the application meets specific criteria, e.g. whether it meets the requirements of the regulation plan.)

- Application for a "simplified single-stage building permit";

(In the case of simple building permit applications, it is possible to apply simultaneously for a building permit and for a commencement permit.)

- Application for a permit to execute the entirety or a part of a project;

  (Application for a permit to commence the entire construction work or a part thereof.)

- Application for change of permits;

  (Application for changing previously granted permits.)

- Application for a temporary occupancy permit;
  (Application for a permit to occupy the building despite the construction being incomplete, provided there is a construction completion schedule.)

- Application for a completion certificate.

Today, those decisions can be issued in the form of electronic documents.

Geographical Information System

There are approximately 32,000 addresses and 53,000 buildings within the territory of Bærum. There have been 1,400 local zoning plans.

The Geographical Information System of the Municipality of Bærum contains all the fundamental geographical information necessary for the performance of the municipality's statutory duties. It includes external registers such as the cadastre, the land registry plan, etc. It is complete, systematically updated, and created pursuant to national standards. Everyone has access to information on the web (excluding legally protected personal information). Browsing raster data is free and available to everyone. Access to vector data is paid.

Geoinformation is created and managed pursuant to the following guidelines:

- SOSI
  - the national system for standardising geographical information, used universally by all manufacturers, suppliers, etc. of geographical information in Norway,
- Norway Digital
  - the national infrastructure for geographical information and implementation of the INSPIRE Directive in Norway,
  - the national program for cooperation with regard to the creation, maintenance, and distribution of digital geographical data,
  - increases the availability and utilisation of geographical data among users, mainly in the public sector,
  - includes, at the level of ministries and their management, all municipalities in Norway and the public institutions for any given region,
- Kataster
  - national system for descriptive information – ownership of land, buildings, and addresses,
  - tied to the Land and Mortgage Register of ownership (ownership, mortgage).

The Geographical Information System of the Municipality of Bærum includes, among others, the following layers:

- Plots and structures,
- Area plans of varying levels of detail,
- Structures,
- Address points,
- Roads,
- Water and wastewater lines (detailed technical information for specialised systems),
- Environmental information,
- Orthophotomap,
- Contour lines – based on laser scans of the terrain,
- Administrative data necessary for the management of a municipality.

Geographical information is used by all local services and professional geographical information users, such as real estate agents, residents, politicians, local organisations, etc.

3.2.3. Education

The Norwegian school system is divided into three levels:

- primary school – first to seventh grade,

- middle school – eighth to tenth grade,
- secondary school (high school) – lasts one to three years.

Primary and middle schools are managed by the municipalities, whereas secondary schools are under the care of county administration. Preschools are also managed by municipalities.

School Districts

The municipality is divided into 24 school districts. In total, the Municipality of Bærum manages 40 primary and middle schools. Children are entitled to attend the school in the district of their residence. However, parents may apply for a child's enrolment at a different school within the municipality, regardless of the school district, but are given no guarantee that the child will be admitted. The admission depends on the number of places available at the school at the time. All children attending the first grade who live more than 2 km away from the school, as well as children attending grade two to ten who live more than 4 km away from the school, are entitled to use a dedicated bus driving them to school and back. All children in Norway who are registered in the National Register are automatically granted a place at a school in their respective school district in October of the year they turn 5. The general rule is that children begin the first grade at the age of 6. There are 24 primary schools within the Municipality of Bærum, 12 municipal secondary school, and one created through a merger of a primary school and a secondary school.

There are 15,000 students aged 6 through 16 in the care of the municipality; they are taught by 1,500 teachers. Approximately 70 applications and 6,000 computers are used at the schools. There are 35 municipal preschools within the territory of the municipality; these are managed by the Education Department of the Municipality of Bærum.

Equipment and System Infrastructure

All educational institutions are connected to distribution nodes which are in turn connected to two parallel optical fibre rings. This means that in the event of a malfunction of one of the rings, the other takes over its tasks for the duration of the downtime. Currently, each school has at its disposal a server room with two computers acting as servers. The servers run either MS Windows or Linux operating systems and the relevant software servicing the students, teachers, and parents. In the recent months the municipal authorities have decided to centralise the server resources due to lower maintenance costs involved in a centralised solution, as well as greater ease of administrating the ICT infrastructure. A joint and centralised solution is:

- cross-platform (Linux and Windows) with shared management and printing tools,
- joint security protocol (antivirus, content control),
- use of public administration competences and solutions,
- joint construction of digital catalogues,
- central back-up,
- automated user management.

The software accessed by students posses the following functionalities:

- unique student identifier,
- access to the application from different schools,
- access to the data from home,
- personal and shared catalogues,
- tasks and solving them on-line,

- access to learning progress data,
- access to absence data,
- centrally defined folder structure and file system (files are moved/copied every academic year),
- shared software with personal progress.

Teachers, on the other hand, have access to software with the following functionalities:

- resource access management portal,
- access to other schools (teacher rotation – substitutions),
- access to the data from home,
- e-mail, capability of mobile phone synchronisation,
- personal data and shared locations for data storage,
- change of student access passwords,
- programs of individual assessment of students,
- registration of absences,
- assigning and managing homework,
- communicating with students on-line via text or video.

The students' parents are able to declare the child's absence via the parent portal; they are also able to track the children's progress and contact the teacher electronically.

A municipality prepared in this manner is able to meet the goals set out by the state and the local government, i.e.:

- new curricula with digital competence requirements,
- National Digital Tests (Digitale Nasjonale Prøver),
- Digital Exams,
- requirements concerning digital documentation,
- enhanced requirements with regard to security, dictated by the growing availability of Internet access.

3.2.4. Tourism

On behalf of the Municipality of Bærum, tourism and culture promotion is the responsibility of the specialised Visit Bærum company, part of Destination Asker and Bærum DA, which is the official partner of Visitnorway for Asker and Bærum (http://www.visitnorway.com/en/Stories/Norway/East/Asker-and-Barum/). Visit Bærum owns the official tourist portal available at www.visitbaerum.no, which provides all the necessary information for tourists and visitors to the municipality.

The website offers the following information in the form of text, images, and animations:

- news and important events (not only tourism related),
- historic monuments and interesting architectural objects,
- natural assets of the municipality,
- active leisure options,
- what to do in Bærum,
- hotels,
- restaurants,
- shops and shopping centres,
- interesting sites worth seeing,
- the municipality in the media.

The website is a guide of sorts, containing a summary of the information sufficient to plan an interesting and diverse stay in the Municipality of Bærum.

The ICT infrastructure of the Visit Bærum tourist portal is managed by a specialist company providing web and hosting services. The company's editors have access to the content management system used to update the data and information published on the portal.

3.3. Conclusions Concerning Cooperation with the Municipality of Bærum

As part of the study visits of the employees of the Krakow City Office to Norway, representatives of the local government presented ICT solutions supporting the operation of the Municipality of Bærum and of Oslo with regard to the investment process, education, tourism, and geographical information. Following the final meetings and analyses, it was decided that any attempt to directly transfer the ICT solutions supporting the operations of the Municipality of Bærum to the City and Municipality of Krakow is not possible without detailed analyses of the differences with regard to organisational and legal matters related to the operation of the two municipalities. Despite this, some elements resulting from the cooperation were used in the Project and may be used in the future.

The architecture of the ICT solutions with regard to the fields listed above utilised the results of the analysis in the form of implementing the following solutions for Project PL0439:

- a virtual data processing environment,
- a clustered data processing environment,
- a centralised data processing environment.

The above conclusions were supported by an analysis conducted by the Norwegian partner, which resulted in the following consequences for the "education" field:

- reduction of the number of virtual VMWare ESX severs from 43 to three by 1 April 2011,
- reduction of the number of servers from 85 to 32 by 1 April 2011,
- reduction of the number of servers from 40 to three by 31 December 2010.

This made it possible to achieve the following service performance indicators:

- reduction of boot time including the loading of the user profile and all necessary system settings and scripts,
- service availability at a level of 99.5% between 8am and 4pm,
- reduction of application errors by 33%,
- reduction of authorisation errors by 50% (e.g. missing system folders, lack of group access, user import errors),
- reduction of running costs by 50% for file / print / login services,
- reduction of costs of licences for the VMWare virtual environment by 80 physical processors,
- reduction of the number of real servers from 150 to 36.

It should be noted that the current standard in Norway is the use of a signature integrated with the user account, and not an electronic signature with a qualified certificate. This contributes to the development of e-service in Norway. Nonetheless, an issue that is certainly worth considering are the future perspectives of e-administration-related cooperation between different countries, since at the moment there is no universal standard for signing documents and data processed using electronic communication.

4. Summary

This publication was intended to present the results of the Polish and Norwegian cooperation with regard to the execution of the Project: "Construction and Implementation of a Dedicated IT System for the Provisions of Modern Local Government Administration Services in Krakow" co-financed with the Funds of the European Economic Area Financial Mechanism and the Norwegian Financial Mechanism, as well as to describe the Project itself.

A description of each Project partner was provided. The core intents and objectives of the investment, along with the results and with consideration for the thematic fields influenced by the Project, were also discussed. The individual products of the investment, i.e. the Investor Portal, the Educational Data Repository, the Virtual Tour of Krakow app, and the Municipal Geographical Information System portal, were described in detail. The pre-Project and post-Project background was given, with emphasis on the benefits resulting from the implementation of new solutions and IT tools at the Municipality of Krakow. Also, a summary of the course of the cooperation between Poland and Norway was provided, which consisted of two study visits of the Polish partner in Norway and two conferences in Poland with the participation of the Norwegian partner.

The Project, carried out by the Municipality of Krakow – Krakow City Office, has greatly enhanced the attractiveness of the Municipality both with regard to investments, and with regard to education and tourism.

The following objectives were achieved through the creation of five portals and web applications:

1. Improvement of the efficiency of fulfilling public administration functions (streamlining the service provided to the residents and lowering the costs of the operation of public administration);
2. Increasing community participation in the processes of planning and developing the municipal agglomeration;
3. Wider access to information (transparency of the public administration activities);
4. Economic and touristic promotion of the region (versatile development of the City of Krakow and the Krakow Metropolitan Area, an increase in the number of visitors to the city and the Krakow Metropolitan Area, as well as an increase in employment).

Additionally, due to the implementation of the above-mentioned system, the Municipality of Krakow has gained the following benefits:

- on-line availability of the municipal office 24/7,
- reducing the number of necessary visits to the office and of telephone calls,
- reduction of the waiting time for the preparation of documents required for investments,
- ongoing updating of geographical data and other data concerning: education, culture, and tourism,
- creation of mechanisms regulating the flow of geodesic and cartographic information between units of the government administration for the purpose of speeding up the decision processes,
- unification of the geographical information of the City of Krakow,

- increase in social satisfaction with the services provided by the local government administration.

The contacts with the Norwegian partner allowed primarily the exchange of experiences with regard to ICT and organisational tools used by public administration units and operating within the investment process, education, tourism, or geographical information. Comparing the Norwegian organisation of e-services, using the Municipality of Bærum as an example, resulted in the implementation of those tested solutions in the Municipality of Krakow and additionally outlined the forecasts for future development of e-administration in Poland.

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6. Photographs