Developing inter and intra-operability.
One of the best Romanian Smart-City study case

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Understanding citizen online goals is critical because it gets to the heart of what the public institution Web site should "do". There are likely to be multiple goals that represent the "reason why" citizen could come to the agencies/institutions Web site. Finding those reasons it is a real challenge. Unfortunately, many public institutions, feel that they should have an online presence only, therefore most of their Web sites are created to offer just a little more than reproductions of its services on an online environment. The purpose of this article is to provide an example of a Romanian public institution Web site, developed for a better interaction with citizens. It will show the initiative of the Brasov City Hall to develop an online technical dispatcher – a dynamic Web site that contains a dispatcher component through which citizens can address in order to provide information about a specific problem encountered in the city and, by that, the responsible institutions to be mobilized timely. The project is consistent with initiatives undertaken at EU level - eEurope 2005, eEurope +, i2010 by adhering to the principles of interoperability, interactivity public services, trust, security, privacy, and is fully consistent with the Romanian Government strategy regarding the informatisation of the public administration. Brasov City Hall Web site can be used as a frame of reference for this type of interaction because it's providing to the citizens a wide range of electronic services, extended availability and increased efficiency in handling the citizens' demands.

1. Introduction

Taking into consideration the new city development there is a need to take decisions based on intelligent solutions (Baltac, 2015). Those solutions cover all the needs that an institution might have, from the internal analyses to monitoring and planning of its activities, timely and with a high level of accuracy (Homburg & Dijkshoorn, 2011).

The city halls efforts regarding the computerization process are conducted towards a sustainable development, with a clear vision (Stoica, 2009), able to allow electronic services delivery to both citizens and businesses as well as to allow data interchange in order to increase the efficiency of its activities (Holzer & Kim, 2005).

For the municipalities in Romania electronic governance is a relatively new practice (the first national project on this theme was initiated in the year 2003 - www.e-guvernare.ro[2]) and it includes digital governance (the offering of public services through electronic means) as well as digital democracy (citizen participation at the governance activity); (Holzer & Kim, 2005).

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[2] Law no.161/2003 sets the legal basis of the National Electronic System, with the declared purpose of ensuring access to "public information and provision of public services towards physical and juridical persons."

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The project called "Integrated Technical Dispatch for the Municipality of Brasov – Geospatial Electronic Services" is willing to extend the computerization initiatives in the city hall of Brasov by delivering electronic services to both citizens and business sector (brasovcity.ro, 2015). There have been implemented software programs for the Dispatch subsystem as well as for the Customer Relationship Management subsystem, Geoportal subsystem, Geospatial Electronic Services Delivery subsystem and the Business Intelligence Reporting subsystem.

The Dispatch subsystem, together with its hardware and software infrastructure, it is what we might call an operational environment which allows integrated information analyses by analyzing data provided from different software and technical equipment operated by the city hall departments.

2. Methodology. What are the reasons for shifting to smart solutions?

Today, for interacting with the public administration, a computer connected to the Internet is usually enough. Connecting from a browser to the specific public institution Web portal is enough (generally speaking) for obtaining and sending information to/from the public administration. (Pardo 2000; Baltac 2008; Vrabie 2009).

If we are to speak about reasons, after a careful analyze of different types of citizens and business sector demands – started during the feasibility study, there have been identified into the city hall some inefficient workflows and data management services (Vlad, 2014). To date, most of the paperwork was manually manipulated; therefore if the public servant intended to computerize the data, he should have input it by hand into electronic files such as a .doc or an .xls file – which, of course, was a time-consuming process (brasovcity.ro, 2011).

Analyzing these facts, we started our research with the following question: What might be the solution for the citizens to access public services by simply clicking on a Web address (http://www.brasovcity.ro/ - the official Web portal of the city of Brasov)?

For increasing the accuracy and improving the citizens' interaction, it was clearly a need for an integrated operational environment, able to provide information and services to whomever address a public utilities issue in Brasov city. By identifying problems such as reducing the timing needed to collect data from the different actors or to empower the specific service provider, there have been developed, through the project, on-line services which might be accessed by the specific partner in order for him to promptly act for solving the situation and, in the same time, to inform citizens about the working status (brasovcity.ro, 2011).

As we stated in the abstract, *the purpose of this article is to provide an example of a Romanian public institution Web site, developed for a better interaction with citizens. We will show the initiative of the Brasov City Hall to develop an online technical dispatcher – a dynamic Web site that contains a dispatcher component through which citizens can address in order to provide information about a specific problem encountered in the city and, by that, the responsible institutions to be mobilized timely.*

3. Program aim and objectives

The main aim of this project was to build such an application witch might be able to bring all problems that Brasov city may encounter under the same umbrella. Therefore, the city management view was to integrate all the subsystems into a complete Web portal by (Vlad, 2014):

- Improving citizens access to the dispatch systems by the use of electronic means;
- Increasing the number of services already provided by new ones like monitoring the performance of the service providers – lighting, sanitation, street maintenance and so on;
- Increasing accountability of the Public Administration by an increase transparency over those services;

The main objective was to develop and implement an Integrated Technical Dispatch for the city of Brasov. It should help both to increase the efficiency of internal procedures, as well as to provide electronic services to the citizens – this being a follow up of an older project, named "Brasov city, a click away!" by with the city hall had built an complex Web portal.

The specific objectives of the projects were:

- Providing new, modern, solutions to citizens by giving them access to specific services to the Dispatch subsystem inside the Web portal as well as to the Geoportal subsystem;
- Building a data exchange infrastructure among public utility providers inside the city;
- Developing an operational environment in which the hardware and software components will allow an integrated and accurate analyze of information.

4. Description

Scientific literature presents five pillars of interaction of the PA with its environment (Baltac 2011; Vrabie 2011).

Pillar 1. Displaying information on the Web sites – one-way communication. This is the easiest form of interaction, posting information on the official Web site with the purpose to inform citizens.

Pillar 2. Two-way communication. Through this method the public administration can collect data from the citizens and business sector, either by e-mail or by using intranet or extranet.

Pillar 3. Financial systems and Web transactions. The Web site integrates all aspects of communication. For the applicant, there is no need for another official procedure, by which he must return to the use of documents in written format. This type of government is partially possible by offering access both to citizens and to the business sector to on-line databases.

Pillar 4. Vertical integration (inter-departmental) and horizontal (intra-departmental) of the public services available on-line. This level of interaction is correlated with the broadband speed - the information synchronization should be in real time.

Pillar 5. Citizen participation to the government activity. In this phase it is promoted the participation through electronic systems like: social media platforms, discussion forums, blogs, e-voting systems, electronic surveys or any other methods of direct and immediate interaction.

The differences between those five pillars are should not be neglected, even though, in practice, there are no clear lines between them. In Romania, nowadays, there are 41 districts, 320 cities including 103 municipalities - all of them have an online Web portal. However, from all those, only few have a Web portal sufficiently developed to allow communication as it is described in the pillars 3, 4 and 5.

The Brasov city official Web portal is one of them. "Integrated Technical Dispatch for the Municipality of Brasov – Geospatial Electronic Services" is built to help the citizens of Brasov to signal any urban problem that they may encounter:

- On one hand, there is a unique phone no. by which the citizens might get in contact with human operators in order to describe the problem that they might have encounter on the public domain (i.e. an infrastructure failure);
- On the other hand, citizens could place a pin, by themselves, to signal the problem that they might have been encounter straight on the municipality Web portal.

Another component was developing an infrastructure platform for exchanging data among public utility companies. Implementing this had the following stages: Problem analyzing, Design, Developing, Configuration, Software integration, System testing, Implementation, Users training.
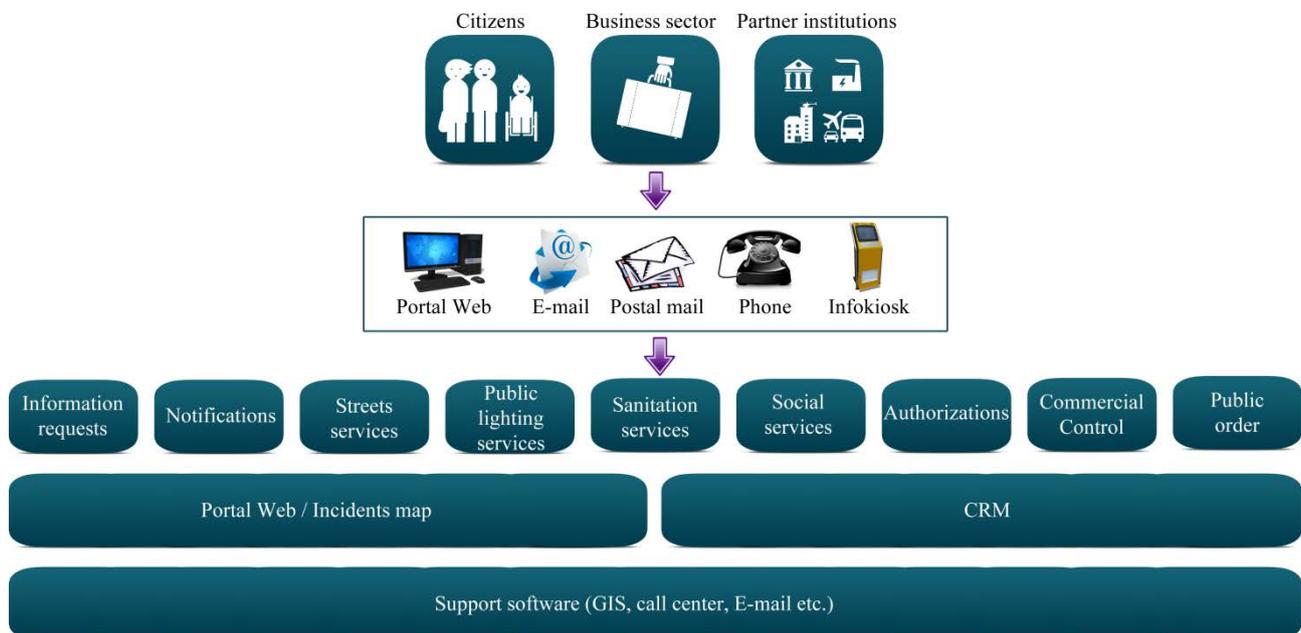
4.1. The Dispatch subsystem – pickup requests

Fig. 1. Dispatch subsystem – Brasov city hall
Source: Brasov city hall

The Technical Dispatch is functioning as an informational and decisional hub made to collect information coming from different systems managed by Brasov city hall (e.g. video monitoring system, public lightning system, semaphore management system, GIS, e-documents management, ERP systems) and from those belonging to the public utilities companies, as well as to provide information to private and public institutions expected to deal with security issues (e.g. Police).

The Call Center component is actually an automatized phone system build for citizens unable to use the Web platform, to provide them the information they need.

4.2. The Customer Relationship Management (CRM) subsystem

This subsystem allows citizens information convergence on the same platform no matter where that information is coming from (i. e. identification information, request records, property taxation and so on). By this, the city hall will have a complete record of the citizen.

Fig. 2. The Customer Relationship Management (CRM) subsystem – Brasov city hall
Source: Brasov city hall

4.3. The Geoportal subsystem

Fig. 3. The Geoportal subsystem – Brasov city hall
Source: Brasov city hall

This subsystem consists in an interactive map – made with an accuracy of ten centimeters, for citizens, to pin the urban problem they face as well as for displaying the problem status. It allows a proper information of citizens regarding the urban problems, as well as, it is allowing them to report any malfunction or service delivery delay.

Another factor we mustn't ignore is that the software provides a transparent communication channel environment throughout the Brasov citizens by showing them short notices about the repair / replacement or any other working activity needed for resolving the issue.

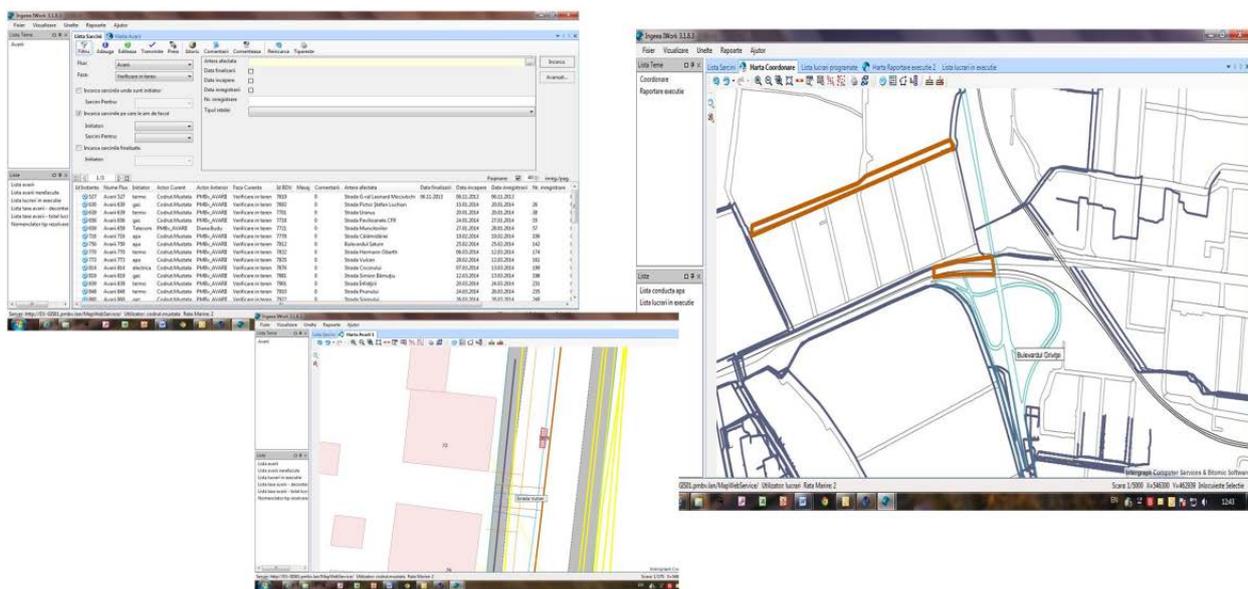## 4.4. The Geospatial Electronic Services Delivery subsystem

Fig. 4. The Geospatial Electronic Services Delivery subsystem
Source: Brasov city hall

This subsystem is bridging successfully utility companies with other partner institution, by allowing a fast endorsement for problem troubleshooting and intervention on the public domain. The requests are filled in on-line, and sent to all the actors involved, together with all the information needed for a prompt intervention (e.g. specific geographical position).

In fact, this is the most complex subsystem. It allows to:
- Solving the citizens request faster and with an increase accuracy;
- Correlating the information regarding the urban problems with the resources acquisition plan;
- Building a common plan for both, repair and maintenance of infrastructure networks;
- Involving partners in updating and maintaining and updated data base with all the public intervention;
- Cutting or reducing costs needed for updating data at the municipality level;
- Reducing the time consumption for the city hall employees engaged in entering the data and validating it for a proper management;
- Information standardization at the municipality level.

4.5. The Business Intelligence Reporting subsystem

This subsystem was developed in order to bring together, under the same screen, all the data from every partner, contractor and sub-contractor who report to the city hall. All this information flow is possible by an easy to use Graphical User Interface who allows to all the actors to input data easily and with accuracy.
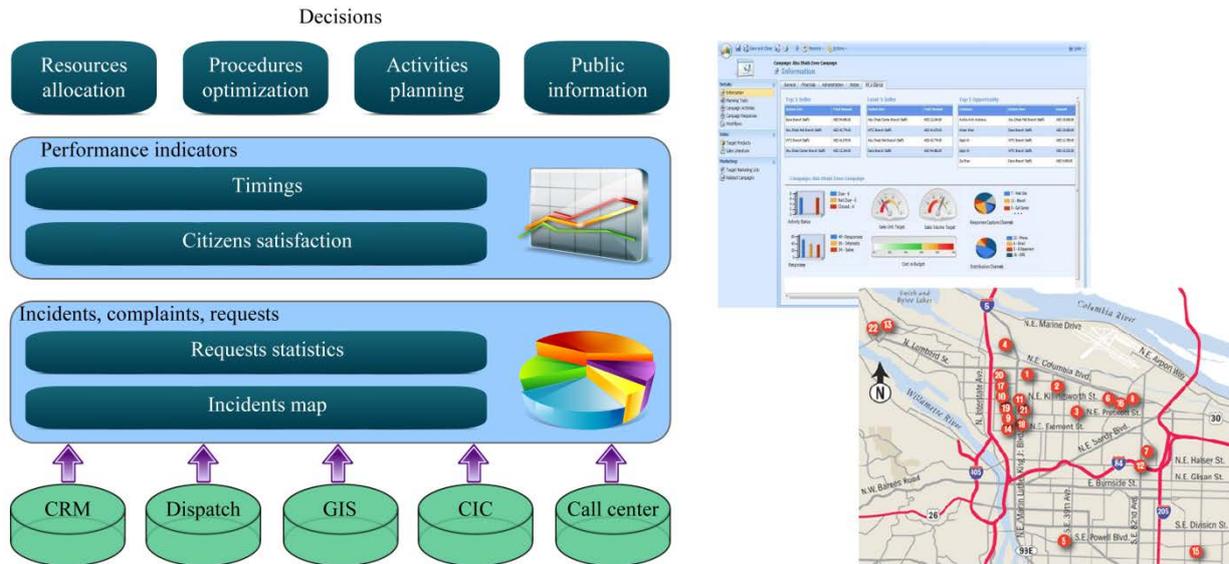

Fig. 5. Business Intelligence Reporting subsystem
Source: Brasov city hall

This site is connected to the following systems:
- Municipality video surveillance;
- Public lightening services;
- Semaphore management system along with data from specific software application used for traffic control and management;
- The geographic subsystem – Geoportal;
- E-documents system.

5. Outcomes

The project brings benefits both to the city hall and its employees as well as to private partners, contractors and other stakeholders such as autonomous utility companies who ensure a sustainable development of the Brasov metropolitan area. Some of those services who helped increasing the management efficiency were:

- Efficient deal with citizen problems;
- Increasing the number of immediate answers;
- Bridging faster institutions or departments able to deal with a specific situation in a competent manner;
- Building a sustainable infrastructure development plan;
- Increasing efficiency on crashes interventions;

- Defining and monitoring the performance indicators linked to all public services provided by the city hall;
- A good and pro-active information campaigns by the use of electronic means regarding the works that have been don on the public domain.

In the same time there have been developed software applications for front and back office. They allow to the Brasov city managers to calculate an average time for each time of intervention. The data gathered by this system might be used to define a standard for service delivery process, as well as for informing the citizens in order for them to have a clear view on the municipality effort. They might also know how much time is usually needed for solving a specific problem (Table 1).

Table 1. Incidents reported by the use of the Integrated Technical Dispatch System

Incidents categories	Total	Active	Solved
Abandoned cars	8	2	6
Animal incidents	28	7	21
Cleaning incidents	38	9	29
Construction and building incidents	4	1	3
Green areas issues	49	1	48
Information delivery processes	1407		1407
Parking incidents	205	2	203
Public lightening problems	45		45
Street incidents	42	6	36
Traffic incidents	9		9
Underground infrastructure incidents	13	1	12
Unknown category	12		12
Urban infrastructure	23	2	21
Water supply	7	1	6
Total:	1899	39	1860

Source: Brasov city hall - November 2015

The system is helping on improving the way the services are provided to the citizens by optimizing performance at the compartments level as well as at the worker level to both the city hall and its partners and contractors.

Another thing we can add is the fact that those systems helps in increasing the administration responsibility by its openness. It is offering a large visibility to the city management to all the working processes and services that the city hall is involved in or provides to the citizens or to private companies.

6. Lessons learned

To be successful, a project like that should consist in a partnership between the citizens – as the most important actor, business sector and public authorities. Only by that it will be possible to be built a solid environment in which information from the public side meets service delivery companies.

Each partner must be responsible for their role and by that to proper interact with the others. Communication is the key issue.

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