# ICT Developments in "Globalization Era" through European Union Funds

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***Abstract* —** Globalization... a term increasingly used in this century. A term that may be terrifying for some and beloved by others, because globalization brings along a number of economic, social, political and cultural changes in certain geographical areas and the "alignment" of the above mentioned elements to the standards of the economically developed countries which initiated the phenomenon of globalization. The main factor that led to the phenomenon of globalization was the development of new information technologies. Presently, ICT (Information and Communications Technology) is the main driver of economic and social modernization. It plays an important role in boosting innovation, creativity and competitiveness of all industry and service sectors. Along with the emergence of new information technologies and their wide expansion, a series of projects aiming at promoting and launching information systems such as online e-government have been started, because the implementation of software products based on e-government concept brings along a number of benefits both for citizens and public institutions. Therefore, increased an amount of funds provided by the European Union was and is allocated to this sector in addition to private investments, recognizing the significance and scale of the latest developments.

***Keywords* —** Digital Agenda, e-government, European funds, globalization, information systems, information technology, innovation, investments, private sector, public sector.

## I. Introduction

THE World Bank defines globalization in the following way: "Globalization refers to the observable fact that in recent years a growing part of the global economic activity is carried out between individuals and companies from different countries."[1]

"Among the more visible manifestations of globalisation are the greater international movement of goods and services, financial capital, information and people. In addition, there are technological developments, new and enhanced legal systems and institutions that facilitate these flows. On the cultural front, there are more international cultural exchanges, the spread of multi-culturalism and greater cultural diversity within many countries. Such developments are facilitated by the freer trade of more differentiated products as well as by tourism and immigration."[2]

The main factor that led to the phenomenon of globalization was the development of new information technologies. Other elements have been added to this factor, such as: lower costs for transportation and greater speed at the end of the Cold War, global issues (climate, migration, etc.), liberalization of world trade.

Along with the development of the new information technologies both software and hardware, a number of changes, primarily economic and social ones, have started to make their presence felt.

"ICT usage has a positive impact on development and thereby on closing the gap, so it is the most important prerequisite in becoming an equal and balanced information society. ICT can be used to expand, compare, and learn from each other and thus for improving performance. But the use of technology should not be the only aim […] but also on empowering citizens by making an interactive access to and use of information available to them."[3]

### *A. Innovation in Information and Communication Technology (ICT) sector*

The innovative role of ICT is that it contributes to a new way of defining and providing services by opening new opportunities in terms of innovative ways.

Innovation in ICT sector provides solutions that can ensure the survival of organizations, maintain position on the market and then expanding market segment. In the context of the new society, based on knowledge, users' demands are increasingly diversified and their satisfaction requires the companies to develop new types of applications. These must be accessible, flexible, safe, user friendly, without additional costs, always available and adaptable.

"In the current economic downturn, innovation is regarded as the main engine able to trigger economy as a whole. Innovation has become an obsession for all economic actors: enterprises, managers, local communities, governors, and consumers. By introducing innovations into practice, products with improved quality characteristics, quality services, new production processes, more efficient and cleaner (ecological), improved models of business management system, modern management methods of work force, etc. can be obtained".[4]

"Innovation and intellectual capital supported by information technologies lead to a broader involvement of the society into knowledge management and to the integration of knowledge management into societal needs. This can help to establish knowledge environment."[3]

ICT has become an effective resource to reduce existing costs and is increasingly adopted as an instrument of innovation and revenue growth, as it enables new services and

working ways in the networks of economic value creation. It is confirmed that ICT has a key role in introducing new business processes, such as organizational and process innovation in companies. Because of the implementation of new systems based on ICT, distinction between "product innovation" and "process innovation" is difficult to define as the products and services are combined in new ways.

*Clusters in ICT sector*

Given that competition on global markets flows mainly on intensive-cognitive innovation sector, small and medium-sized enterprises (SMEs) have great growth opportunities, being capable of high flexibility and mobility on dynamic and differentiated niches. The third generation SMEs, based on new technology, include: "start-ups/high-tech" (new enterprises based on peak technology) and "spin-off/spin-out" (disseminating type enterprises), which are defined as implying the creation of new enterprises for selling knowledge and skills of a university or an industrial research team.

Through innovative management, clusters and networks are created by the organizations who are not satisfied to only adapt to what exists, but impose their way of thinking and action, creating new areas of environment, reshaping it based on innovative strategies. In the current context of globalization, cluster policies have become a useful resource for achieving the objectives of the Lisbon Strategy which states that the European Union (EU) economy should become a competitive economy based on knowledge.

Attractive content and services should be made available in an interoperable Internet environment without borders. This stimulates demand for high capacities and speed, creating the premises for further investments in faster networks. Introduction and adoption of these networks open, in turn, the way for innovative services able to exploit these higher speeds. All efforts are focused on delivering results that aim consumers' access to services of good quality and reasonable price.

### *B. Globalization and Its Social "Consequences"*

"Globalisation is not an entirely new phenomenon since the internationalisation of markets and cultures (e.g., the spread of global religions) has been occurring for millennia, but the latest phase of globalisation is qualitatively distinct"[5] and much more aggressive.

In the web or online environment, the phenomenon of globalization makes its presence felt only within a "mouse click" distance, reducing thus an entire planet to just one city or one country, as distances, no matter how long they are, disappear instantly. And still, the true impact of globalization makes its presence felt in the way employees perform business activities, in the information exchange between citizens and state institutions (e-government) or even in the way of learning (e-learning).

Whether we like it or not, globalization affects the lives of ordinary people, indirectly, by changing their traditional way of socializing, learning and working.

## II. E-Government - The "Response" of the Public Administration to Globalization

"Globalization is the child of both technology and policy." said Joseph Nye, jr., Professor of International Relations at the Kennedy School of Government at Harvard University. "Governments need to adapt to keep the pace with the transformation from the industrial age to the information one."[6] Thus, e-government is both part and direct consequence of globalization.

Along with the emergence of new information technologies and their wide expansion, a series of projects aiming at promoting and launching information systems such as online e-government have been started. "Governments around the world are implementing innovative e-Government systems and services."[7] "The implementation of software products based on e-government concept brings along a number of benefits both for citizens and public institutions: much easier access to information and documents for citizens, avoidance of crowds at the front desks and the fact that public employees no longer need to deal with the public directly."[8]

The main types of e-government information systems in the developed world are divided into two categories:

a) information systems dedicated to the interaction between citizens and state institutions. This category includes the following systems: Income Taxes, Job Search, Social Security Benefits, Personal Documents, Car Registration, Application for Building Permission, Declaration to the Police, Public Libraries, Birth and Marriage Certificates, Enrolment in Higher Education, Announcement of Moving, Health-related Services, etc..

b) information systems dedicated to the interaction between legal persons / companies and state institutions. The following systems fall into this category: Social Contribution for Employees, Corporate Tax, VAT, Registration of a New Company Submission of Data to the Statistical Office, Custom Declaration, Environment-related Permits, Public Procurement, etc.

Although "European Union (EU) has provided a strong support to implementation of ICT into public administration at all levels to strengthen development of information society and e-Government"[9], the percentage of the citizens who prefer using the traditional communication channels (the phone, the front desk, the regular post-mail or the e-mail) in their relationships with the state institution is very high, both at Romanian and European level. Even the statistics provided by Eurostat (The Statistical Office of the European Union) account for this thing (Table 1) in 2009, an average of only 28% of the Europe citizens resorted to the public institution sites (a very small percentage in comparison with the huge amounts invested in these types of systems).

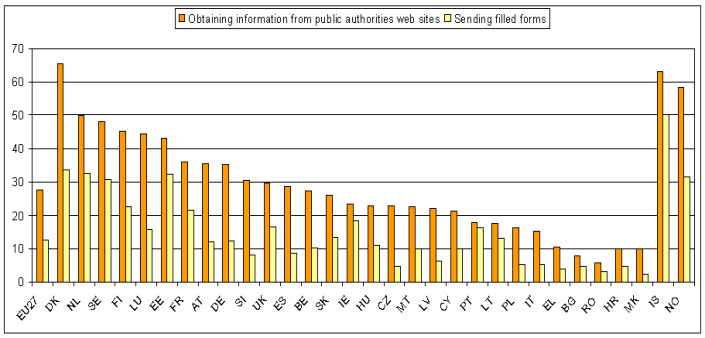


Table 1 – Online interaction of individuals with public authorities, 2009; source: [10]

*A. Critical Factors that Can Influence Negatively the Success of an e-Government Information System*

In the "information technology and Internet era" the fact that e-Government systems do not live up to the expectations (except for very few European countries including Denmark, Iceland, Norway) it is a real paradox. "Citizens were asked for their reasons for not using online government services. The most mentioned obstacle was the lack of personal contact followed by concerns about data protection and security."[10]. They have also mentioned: the complexity of online applications and their availability, the lack of an immediate response from the public institution and the "fear" of extra costs for using e-government information systems.

However, beyond the above listed obstacles that stay in the way of using an e-Government system, the main disadvantage of such a system is its inability to help the citizen to access a service or another when facing an ambiguous situation. "Over the phone and at the front desk civil servants are able to interpret a citizen's contextual situation without much help of that particular citizen, while a Web site is unable to do it. Interpreting a contextual situation is often necessary in order to help citizens."[11] So, an e-government system can replace the human factor but cannot substitute it 100%.

"True e-services need to be developed around user needs. Transferring existing papers, files and information from different agencies into web, and placing some hyperlinks between them is not enough. The services should be integrated, enhance self-service and trust so that users see the added value of electronic services. Technologically, users should be able to complete most of their transactions online. Here easy-touse, robust and trustworthy services are needed so that more users start using e-services in public sector."[12]

We suggest the possibility that the factors that negatively influence the success of an e-government information system be controlled and eliminated through measures such as:

- carrying out a study or a market research prior to the stage of information analysis and design of the future e-government system, so that it is "compatible" with the needs and expectations of the citizens who will use it;
- the use of advanced information technologies in developing and implementing e-government systems;
- an intense, sustained and long term promotion of the new e-government system "freshly" opened on all the local channels of communication: radio, TV, newspapers, Internet;
- the development of some educational campaigns for the citizens on how to use e-government information systems by means of the channels of communication: radio, TV, Internet, newspapers.

*B. Criteria for Evaluating the Performance of an e-Government Information System*

"The main goals of e-Government include: improving government services and the delivery of these to the citizens; enhancing the government interaction with the businesses and industry from a side and with the citizens from another side; using e-Government applications to increase the transparency of government agencies and organizations by making their related information clearer and more accessible."[13]

The success of an e-government information system can be regarded both "qualitatively and quantitatively".

In terms of "quantity", we suggest that the success of an e-government information system could be measured taking into account information such as:

- number of users accessing the system daily/ weekly/ monthly/ yearly, etc.;
- number of calls per day/ week/ month/ year, etc. received by the institution that belongs to that system;
- number of persons per day/ week/ month/ year, etc.. who were physically present at the front desk of the institution that belongs to that system;
- number of errors which occur in the system over a certain period of time (day/ week/ month/ year, etc.) and are reported by the citizens;
- the decrease in the percentage of corruption in public administration from the geographic region the system belongs to.

In terms of "quality", the appraisal of an e-government information system success is a difficult thing to achieve and the results can be observed over longer periods of time (months, years, etc.). Therefore, we suggest that the success of an e-government information system in terms of "quality" could be appraised taking into account information such as:

- the "accessibility" for the citizens to find the information they are interested in quickly, without having to install or use any 'special' browsers to access the information;
- the extent to which the system helps the citizens to access a service or another if they are faced with an ambiguous situation;
- the extent to which the system ensures transparency and reduces bureaucracy for processing an application.

In order to have a more rapid feedback from the citizens who have accessed the services of an e-government information system, we suggest that the institution to which the system belongs insert in the application pages a small questionnaire with questions regarding the citizens' degree of satisfaction as to the quality of that system services.

*C. Principles of Ticketing Systems Extrapolated to e-Government*

As we have shown above which are, from our point of view, the factors influencing the success and the criteria for performance evaluation of an e-government system, we will continue with describing an e-government system based on the principles of a computerized ticketing system, intended to highlight the value of our proposals in paragraphs *II A.* and *II B.*

Computerized ticketing systems used by companies usually for their Helpdesk teams have often proved their performance even where users (seen as customers) had lower skill level in working with computers. The great advantage of a ticketing application is its user-friendliness itself. Normally, a customer, once entering his/her account in the application, all he/she has to do to create a new ticket is to fill in the comment field, explaining the problem faced, and the ticket will instantly reach the team in charge with handling the reported issue. In other cases, besides the comment field, the client may also choose the type or category of the problem encountered, so that ticket should be escalated to a specific team/department. Once it arrives at destination, the ticket is opened by one of the dedicated team members and resolved, being finally classified as "closed".

Given that a ticketing application is simple to handle by ordinary users in terms of their IT knowledge, and owing to the fact that ticketing systems have proven successful for companies, the idea to extrapolate the ticketing system to public administrations to help them deal with requests from citizens/companies in an online environment can become a real success story. In order to test this idea, we have developed an e-government system based on ticketing system principles, where the customers are the citizens and/or the companies themselves. The system is available for online consultation and testing at: http://www.egovernment-system.eu. The purpose of this system is to ensure an automated exchange of the information flow between citizens/companies and a local government institution, i.e. a Mayor's Hall. The computerized e-government system proposed by us comprises the following two modules:

- the citizens/companies module;
- the public administration staff module (allowing visualization and handling of requests/tickets received from citizens/companies).

Next, we will present the principles and the operation of the two modules of the e-government system proposed by us. It should also be mentioned, right from the start, that, though this system has basically been designed and conceived for mayor halls in Romania, it may, nevertheless, be tailored to suit the needs of any mayor halls in any country wishing to implement it.

*a) Presentation of the proposal to develop a computerized e-government system for a mayor hall – the citizen / company module*

Being compliant with the data security rules of any information system, the system we are proposing allows access of citizens/companies to its functions, based on a username and a password (see Fig. 1). However, given that we are dealing with an information system of an e-government type, the user will actually be the personal identification number (CNP) of the citizen or the tax identification code (CIF) of the company. Password may nevertheless be chosen by the user.

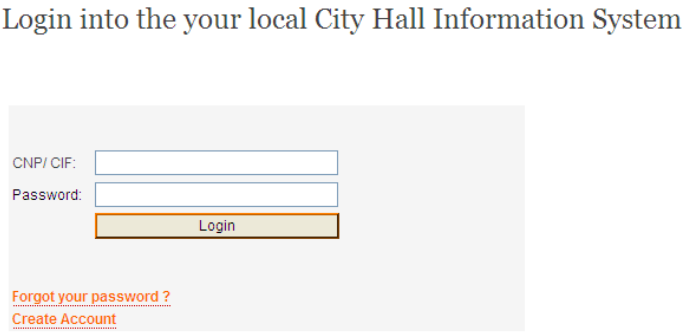


Fig. 1 – Access of citizens/companies to the e-government system

If the citizen/company has never used before the online service provided by the public administration, he/she can create an account in the system, without the need for prior consent of mayor's hall (see Fig. 2).

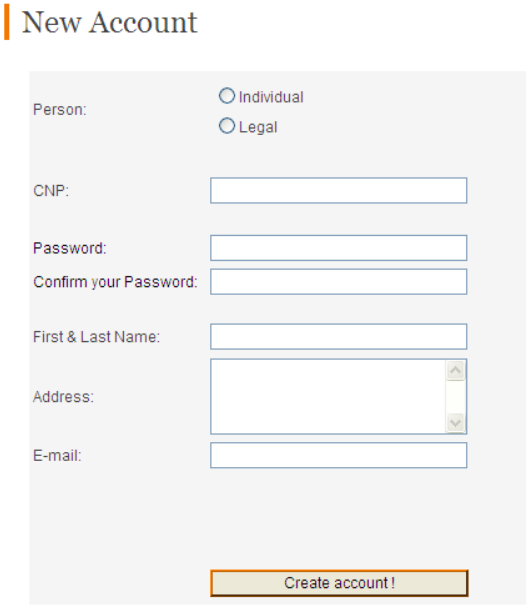


Fig. 2 – Creation of a new user account in the e-government system

As one may probably expect, the information entered by the user should have a real basis, because this information will have to be validated by the system. Validation will be done not only at the interface or the database level, but also through inquiries with the Police and the Trade Register databases (for

Romania), to check on the veracity of the CNP/CIF. If the validations are completed successfully, the system allows to also check whether or not the citizen/company concerned is under the jurisdiction of the mayor hall into whose e-government system the citizen/company is attempting to create an account. If any of the aforementioned validations fails, then the citizen/company in question will not be allowed to create his/her/its account in that public institution's e-government system.

If the account is successfully created, the user will have access to the main function of the system: that of creating a request addressed to the mayor's hall and asking for solving of his/her/its problem (see Fig. 3). In fact, the creation of this application is equivalent in the ticketing system to creation of a ticket. Another function the user will have access to after logging into the system is that the user is allowed to change the information in the user's initial account profile.


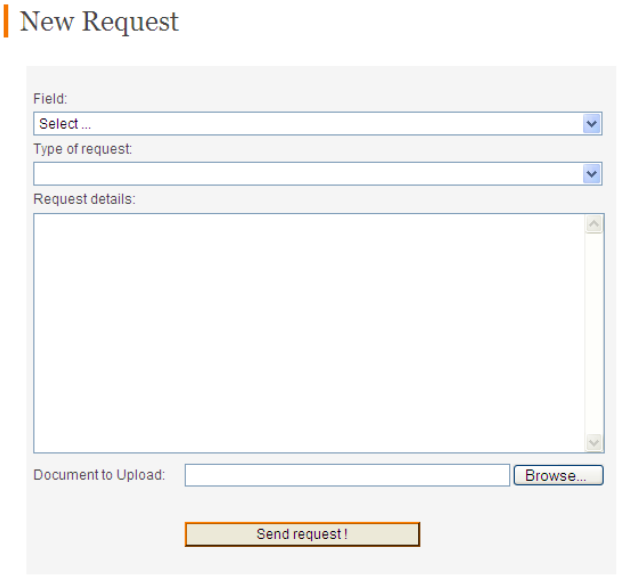


Fig. 3 – System function allowing citizens/companies to create and address a request to the mayor's hall.

The user may write the content of the request under the field "Request Details" and may also attach, where appropriate, an electronic file with the option "Browse" shown in Fig. 3.

Given the fact that requests sent to mayor's halls may vary tremendously in their content and may be addressed to different departments within the mayor's hall, on the new request generation page, the user has the possibility to choose the subject matter (field) as well as the type of request the user wants to create (these two options correspond, in Fig. 3, to the fields "Field" and, respectively, "Type of Request"). Thus, the request may be automatically forwarded by the system directly to the department within the mayor's hall entitled to settle down the request concerned.

When a request is issued by a citizen/company, it will be put in the "wait" status for one hour, during which time none of the members of the target team will be able to visualize it, while the user will still have the chance to modify the content of the request or even to delete it. After the one hour's time interval, the request functions "modify" and "delete" will be disabled. Modifications will then be possible only from the user's profile with the option "All Requests" (see Fig. 4 and 5).


Fig. 4 – Visualization of all the requests issued by a citizen/company to the mayor's hall.

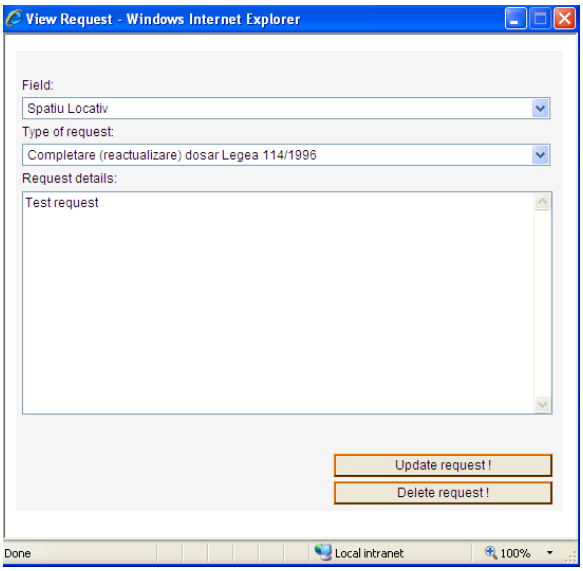


Fig. 5 – Visualization of the details of a request issued by a citizen/company to the mayor's hall, while still in the "wait" status.

The statuses through which a request goes through until it is solved are:

- "Wait" status - the request has just been issued by the citizen / company;
- "Open" status - the request is opened by an employee of the institution and is being processed;
- "Closed" - the request is settled and closed.

Fig. 4 shows that the citizen/company has a permanent track record both of the requests sent to the mayor's hall and

of the current status of each and every request.

*b) Presentation of the proposal for development of an e-government system for mayor's hall – citizen/company module or mayor's hall staff module*

When a mayor's hall hires a new person, the e-government system administrator will create to the newly hired a new account in the system, so that the new employee may have access to the e-government system based on a username and a password (that he/she can change it later, after accessing the system), both assigned by the system administrator.

Once authentication has been made in the system, the user can view on the "Home" page of the system all the requests in the "wait" and in the "open" status, which have been automatically assigned by the system directly to the team/ department the authenticated user belongs to (see Fig. 6).

Department requests

| Field | Type of request | Request date | Status | Open by | View details |
|---|---|---|---|---|---|
| Economic | Achizitii produse | 11/29/2010 4:02:51 PM | Open | Elena Litan | Details |
| Administratie Publica Locala | Dovada de intretinere pentru personalul roman cu contract de lucrari in Germania | 12/10/2010 4:24:17 PM | Open | Employee Name | Details |
| Economic | Achizitii lucrari | 12/10/2010 4:26:41 PM | Wait | | Details |

Fig. 6 – Visualization of all requests in "wait" and "open" status automatically assigned by the system to one department/ team, after they have been issued by a citizen/company.

As could be seen in Fig. 6, the details of a request can be viewed by accessing the option "Details" (see Fig. 7) corresponding to each line in Fig. 6.

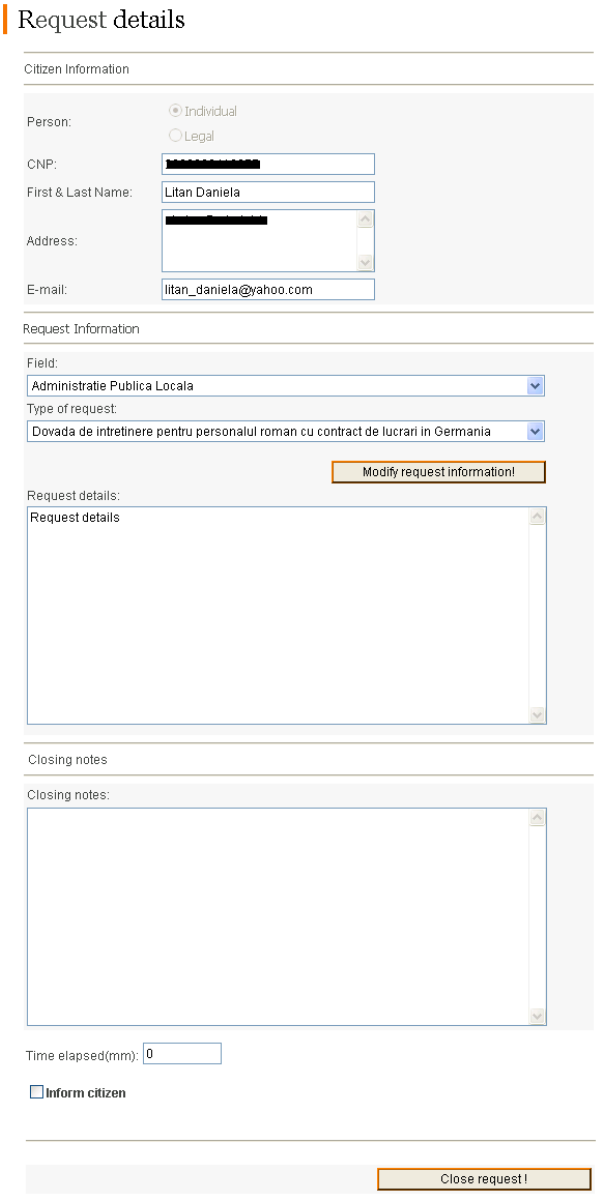


Fig. 7 – Request details – visualization

*Note:* When a user accesses the option "Details" and the request is initially in the "wait" status, then the user concerned will have to also solve the request accessed, then switching from the "wait" to the "open" status. In the event that a user happens to open a request already in the "open" status, the user will have the right to visualize the request, but not the right to settle or close it ("closed" status).

In Fig. 7, could be easily seen that:

- if a citizen/representative of a company originally selects the wrong subject matter (field) of the request and/or type of request (these two options correspond, in Fig. 7, to the fields: "Field" and, respectively, "Type of Request"), the user (mayor's hall employee) of the e-government system may change the initial option/options and then confirm the new selection made under the two fields by pressing the button "Modify request information!";

- following settlement of the request, the citizen/company is informed on how the request was resolved, provided that the mayor's hall employee checks the option "Inform citizen", before closing the request (option "Close request!"). The citizen/company concerned will be informed on the settlement of his/her/its request via an e-mail message. The e-mail message will contain, in addition to request identification information, the contents under the filed "Closing Notes" shown in Fig. 7, describing the exact manner in which the request has been resolved.

It should also be noted that our proposed e-government system for mayor's halls also provides the opportunity to view all the requests closed over the time, as well as the chance to restore a request from the "closed" status into the "open" status, where the request was closed by mistake or if the citizen/company was not satisfied with the proposed solution and came back asking for a reconsideration of the request concerned. Obviously, a change of the request from the "closed" to the "open" status can be done only by an authorized user, such as the department manager and/or the user who initially turned the request to the "closed" status.

Perhaps not surprisingly the system is also provided with the possibility to add or delete predefined fields and types of requests, but such options will only be enabled for administrator-type system users.

A feature that is worthwhile mentioning here is that all changes made on a request, using the module designed for use by City Hall employees, can be simultaneously viewed in the citizens / companies module, too.

We all know how important and how significant are the benefits using information systems in general, and also the use of information systems for e-government in particular. But, *the arising problem is caused by the costs involved by the development of information systems especially in public institutions*.

## III. European Funds for Information and Communication Technology (ICT)

The financier of an information system for public institutions is just the state: the "owner" of the future information system. And, because most of the times, information systems development and implementation costs are very high, states may face difficulties to fully guarantee the financing. As an alternative, European countries can take into account the available funds at European Union level.

### *A. An Overview of the European Funds for Information and Communication Technology (ICT)*

The European Union announced for 2011 record investments in research and innovation. For example, to stimulate research in ICT, 1.2 billion euro will be used. Around 600 million euro of available funding for ICT infrastructure are allocated to the next generation of networks and services, robotic systems, electronic and photonic components and technologies for digital content. Over 400 million euro will be spent to support research on how ICT can contribute to address challenges such as achieving a low carbon economy, solving the problem of an aging society and executing adaptable and sustainable plants. Additionally, 90 million euro will be allocated in 2011 for public-private partnerships for the future Internet, in order to transform the essential European infrastructure in "smart infrastructures".

The European Commission has launched in March 2010 the Europe 2020 strategy aiming to get the economy out of crisis and prepare the European Union for the challenges of the next decade. This strategy outlines a perspective that presumes a high degree of employment, creation of an economy with low carbon emissions, productivity and social cohesion, goals to be achieved through concrete actions at European Union and national level.

*Digital Agenda for Europe* is one of the seven pilot initiatives included in the Europe 2020 strategy and aims making the most of social and economic potential of ICT, especially the Internet, which represents a vital support of economic and social activities, equally for business, work, entertainment, free communication and how we express ourselves. Successful implementation of this agenda will stimulate innovation and economic growth, while improving the quality of everyday life of citizens and enterprises.

*Competitiveness and Innovation Framework Programme (CIP)*

The 3.6 million euro allocated for the period 2007-2013 on this European programme aim towards increasing of SMEs competitiveness, to support their innovation activities and better access to finance. "In the public funded projects sector, the multinational companies know in detail the requirements of the external financial assistance and provide their expertise. They can easily assist and manage the projects from distance using the facilities offered by the new technologies."[14]

One of the three specific target areas is represented by the Information Communication Technologies Policy Support Programme (ICT-PSP), which is focused on pilot actions for validation of innovative and interoperable ICT based services (ICT for health, ageing and inclusion, ICT for public services, digital libraries, ICT for energy efficiency and mobility, multilingual web and Internet improvement).

*a) Digital Agenda for Europe*

The European Commission has presented an ambitious "Digital Agenda for Europe" on 19 May 2010. It is designed to significantly contribute to economic growth of the European Union and to spread the digital age benefits across society. The Digital Agenda represents the first of the seven pilot initiatives of Europe 2020 for intelligent, sustainable and inclusive growth. The Agenda sets out seven priority areas: creation of a single digital market; increased interoperability; enhanced security and confidence in Internet; faster Internet access; more investments in research and development; raising skills level and inclusion in terms of "digital literacy"; and applying information and communication technology to solve

the problems facing society, such as climate change and population aging. Further, it provides 100 subsequent actions, including 31 legislative.

The main objectives of Digital Agenda are as following:

1. A new single market for better benefit of the digital era:

- Citizens should be able to enjoy cultural entertainment and shopping services on a transnational level, but EU's online markets are still separated by barriers that restrict access to pan-European telecommunications services, as well to digital services and content.
- In the USA, four times more music than in the EU is downloaded, where legal offers are lacking behind and markets are fragmented. European Commission plans to open access to legal online content by simplifying procedures for granting and management of copyright and licensing procedures. Other actions include facilitation of electronic payment and billing operations, and simplification of online dispute resolution.

2. Improved ICT standards and interoperability: We need open and interoperable ICT products to allow citizens the possibility to create, combine and innovate.

3. Enhanced security and trust: Europeans do not adopt a technology that they do not trust – they must feel safe and at ease when accessing online content. A better coordinated European response to cyber attacks and firm rules regarding personal data protection are part of the solution. It can also be taken actions that could oblige website operators to inform potential users about possible violations of their personal data security.

4. Improved Europeans access to fast and ultra high-speed Internet:

- The target for 2020 is to make Internet available to all European citizens at speeds of 30 Mbps or more, and 50% of European households subscribed to at least 100 Mbps connections.
- At present, only 1% of Europeans have a high speed Internet connection through fiber optics, compared to 12% of Japanese and 15% of South Koreans. Ultra high-speed Internet is essential for a strong economic growth, for creating jobs, for prosperity and for guaranteeing citizens access to desired content and services. The European Commission will explore among other aspects, the possibilities to attract investments in broadband networks, through mechanisms that improve credit conditions and will provide guidance on encouraging investments in fiber optic networks.

5. Boosting research and innovation in leading ICT: Europe must invest more in research and development and to ensure that the best ideas are materialized on the European market. Digital Agenda aims among other things to encouraging private investments through European funding at regional level and increased funding for research in the EU to ensure that Europe could keep up with the competition and even exceeds it. The EU investments in ICT research amounted to less than half the USA level of investment (EUR 37 billion, compared to EUR 88 billion in 2007).

6. Provision of services that could be accessed online and digital skills for all European citizens: More than half of the European citizens (250 million) use the Internet every day, but other 30% have never used it. Everyone, young and old, regardless of social background, have the right to acquire knowledge and skills needed to participate in the digital age, given that public, social and health services, commerce, education and political life increasingly migrate online.

7. Harnessing the potential of ICT for society benefit:

- Investments in intelligent use of information technology, in exploitation of information in order to seek solutions to reduce energy consumption, to support the elderly people, in empowerment of patients and improved online access for people with disabilities are needed.
- One of the purposes would be that by 2015, patients can access their medical records online, from any point in the EU they are at one moment. Digital Agenda will boost in the same time the ICT for energy savings, such as solid-state lighting technology (SSL) which uses 70% less power than standard lighting systems.

Priorities of the European Commission aim to stimulate innovation and competitiveness and to accelerate the development of a sustainable, competitive, innovative and inclusive information society. Activities to accelerate innovation and implementation of ICT-based services and systems by taking larger and better use of ICT and explore digital content by the citizens, government bodies and business world are supported.

Acquisition of ICT in business is generally targeted by the private sector and the public policies should focus on creating the best conditions for business development and raising awareness about the benefits of technological innovations, especially for SMEs.

ICT acquisition and exploration of digital content in public areas such as health, inclusion, culture, public sector information, education, public administration and energy efficiency require more proactive policies. The main obstacles to wider and better use of ICT in these areas include the availability of ICT-based services, lack of interoperability solutions between Member States, market and space-based information fragmentation and of ICT solutions.

EU investments are intended to overcome obstacles that prevent the development of an information society for all, development of markets for innovative ICT-based solutions and digital content, especially in areas of public interest. For SMEs, new business opportunities are open. Both innovative SMEs in the ICT sector and SMEs that can make better use ICT are supported by EU funds to improve their products, services and business processes.

*Benefits of ICT in business sector and small and medium enterprises (SMEs)*

ICT is responsible for almost half the gains in productivity of today's economies. Gains are achieved because of both goods and services based on innovative high value ICT and business processes improved through the dissemination,

adoption and use of ICT throughout the economy.

The sectors that make intensive use of ICT include industrial manufacturing, automotive, aerospace, pharmaceuticals, medical equipment, food industry, as well as financial services, media and retail. Benefits reported by firms as a result of increased use of ICTs include faster product development, lower costs and expenses, faster and more secured transactions, better relationships with customers and suppliers, improved levels of service and support for customers and increased opportunities for collaboration.

*Benefits of ICT in public services*

E-government services are one of the most effective means to fight against corruption, a key factor of institutional transparency and credible business environment in Romania. Besides these significant effects, implementation of the e-government solutions results in: improvement of the information quality, reduction public administrative costs and the general regulatory framework for citizens and businesses. Institutional transparency, credibility of regulations and costs reduction are key factors for competitiveness of an economy.

Ensuring availability of services and educational resources on the Internet, e-education, together with increasing the use of Internet and endowment with computers of educational institutions will generate a better prepared and more flexible workforce, adapted to increased market needs, with positive effects on labor productivity, wages and employment.

Savings brought by e-health services both within the medical system and for the patients are considerable. Additional, can be added improvement of services through a better record of patient history, increase of awareness and reduction of general personal visits. These last benefits represent savings at national economy level and contribute in the same time to improving labor productivity of employed persons or to increasing the number of active persons. Implementation of the e-health system require not only endowment with adequate technology, but also a restructuring of the health care system, restructuring to allow greater mobility in terms of location where patients can be treated, as well as mobility of financial resources.

*ICT and development of e-commerce*

Increasing competitiveness in an economy requires development of a safe and dynamic e-business, by increasing the number and usage degree of e-Business opportunities for the companies in general, and especially for SMEs. Electronic commerce in particular, like ICT in general, is likely to generate significant long-term cost savings and facilitate access to domestic and external markets.

The advantages of electronic commerce increase with the number of participants and generally can be called a virtuous circle in its development. Increased security of electronic communications networks, adoption of ICT anti-fraud solutions and promotion of smart cards contribute to the development of the e-business environment to better use of ICT environment by the enterprises.

*ICT benefits for citizens*

ICT are opening numerous opportunities for citizens and consumers of Europe and beyond. There is a variety of applications including health care provisions, transport systems, as well as innovative interactive systems for entertainment and learning. Innovations in ICT can contribute to improving the prevention of diseases and safety of health care, to facilitating active participation of patients and to provision of personalized care. Also, problems associated with aging can be undertaken.

*ICT benefits for researchers*

ICT research activities cover strategic priorities in developed industrial and technological areas, such as communication networks, applied computing, nano-electronics and technologies for audiovisual content. Areas of research include:

- Stability and security of networks infrastructure and services;
- Performance and reliability of electronic systems and components;
- Personalized ICT systems;
- Digital content management.

ICT continues to be the main driver of economic and social modernization. It plays an important role in boosting innovation, creativity and competitiveness of all industry and service sectors.

Today, we enter a new phase of development that will lead to growth and sustainable development for the coming decades. However, this would be feasible only if investments are made now in research and innovation for the next generation of technologies. In a global marketplace, information and communication technology (ICT) has become an essential element for strengthening the competitiveness in all sectors. Extensive use of ICT contributes by default to growth. Training people to face new technological systems challenges is crucial in order to fully benefit from the advantages brought by ICT implementation in society and economy. Both support of innovative approaches and promotion of ICT aim at improving competitiveness, creating new jobs and strengthening the potential to improve the quality of life.

*b) People's access to information and communications technology*

The economic crisis has brought the European Union in a position to redefine its priorities. Thus, continuation of efforts for a consistent and efficient Digital Agenda (2010-2015) occupies an important place in the vision the European Commission. According to recent statistics, the EU ranks behind China and India in the digital sector. In Europe, 50% of productivity growth is given to the last 15 years of information and communication technologies, and six in ten Europeans regularly use Internet. However, Europe must accelerate the speed to fully exploit the potential advantages

of the digital economy, providing faster broadband and Internet services, in which the public can trust, enhancing skills and encouraging more innovation in ICT.

The following table presents the evolution of Internet users in EU countries during 2000-2010.

| EUROPEAN UNION | Population ( 2010 Est. ) | Internet Users, Latest Data | Penetration (% Population) | User Growth (2000-2010) | Users % Table |
|---|---|---|---|---|---|
| Austria | 8,214,160 | 6,143,600 | 74.80% | 192.60% | 1.30% |
| Belgium | 10,423,493 | 8,113,200 | 77.80% | 305.70% | 1.70% |
| Bulgaria | 7,148,785 | 3,395,000 | 47.50% | 689.50% | 0.70% |
| Cyprus | 1,102,677 | 433,800 | 39.30% | 261.50% | 0.10% |
| Czech Republic | 10,201,707 | 6,680,800 | 65.50% | 568.10% | 1.40% |
| Denmark | 5,515,575 | 4,750,500 | 86.10% | 143.60% | 1.00% |
| Estonia | 1,291,170 | 969,700 | 75.10% | 164.50% | 0.20% |
| Finland | 5,255,695 | 4,480,900 | 85.30% | 132.50% | 0.90% |
| France | 64,768,389 | 44,625,300 | 68.90% | 425.00% | 9.40% |
| Germany | 82,282,988 | 65,123,800 | 79.10% | 171.30% | 13.70% |
| Greece | 10,749,943 | 4,970,700 | 46.20% | 397.10% | 1.00% |
| Hungary | 9,992,339 | 6,176,400 | 61.80% | 763.80% | 1.30% |
| Ireland | 4,622,917 | 3,042,600 | 65.80% | 288.10% | 0.60% |
| Italy | 58,090,681 | 30,026,400 | 51.70% | 127.50% | 6.30% |
| Latvia | 2,217,969 | 1,503,400 | 67.80% | 902.30% | 0.30% |
| Lithuania | 3,545,319 | 2,103,471 | 59.30% | 834.90% | 0.40% |
| Luxembourg | 497,538 | 424,500 | 85.30% | 324.50% | 0.10% |
| Malta | 406,771 | 240,600 | 59.10% | 501.50% | 0.10% |
| Netherlands | 16,783,092 | 14,872,200 | 88.60% | 281.30% | 3.10% |
| Poland | 38,463,689 | 22,450,600 | 58.40% | 701.80% | 4.70% |
| Portugal | 10,735,765 | 5,168,800 | 48.10% | 106.80% | 1.10% |
| Romania | 21,959,278 | 7,786,700 | 35.50% | 873.30% | 1.60% |
| Slovakia | 5,470,306 | 4,063,600 | 74.30% | 525.20% | 0.90% |
| Slovenia | 2,005,692 | 2,003,136 | 64.80% | 332.80% | 0.30% |
| Spain | 46,505,963 | 29,093,984 | 62.60% | 440.00% | 6.10% |
| Sweden | 9,074,055 | 8,397,900 | 92.50% | 107.50% | 1.80% |
| United Kingdom | 62,348,447 | 51,442,100 | 82.50% | 234.00% | 10.80% |
| European Union | 499,671,847 | 337,779,055 | 67.60% | 257.80% | 100.00% |

Table 2 – Number of Internet users in the 27 EU Member States; source: Internet World Stats

The countries with the most Internet users at global level are China (420 million users), USA (239.8 million users), Japan (99.1 million users), India (81 million users) and Brazil (75.9 million people users).

*Evolution of the number of Internet users in Romania*

Online penetration is about 35.5% in Romania, the country being the last of the EU Member States, given that the European Community's average is about 67.6%. The Member States with the highest level of Internet use are Sweden (92.5%), Netherlands (88.6%), Denmark (86.1%), Finland (85.1%) and Luxembourg (85.1%). On the other hand, the most of Internet users are in Germany (65.1 million users), UK (51.4 million users), France (44.6 million users), Italy (30 million users) and Spain (29 million users). Subscribers to Internet services in Romania represent about 1.6% of the EU users, approximately 337.7 million users. In comparison, ten years ago, Romania had about 800,000 Internet users, while in 2004 their number reached four million and five million in 2007.

| YEAR | Users | Population | % Pop. |
|---|---|---|---|
| 2000 | 800,000 | 22,217,700 | 3.60% |
| 2004 | 4,000,000 | 21,377,426 | 18.70% |
| 2006 | 4,940,000 | 21,154,226 | 23.40% |
| 2007 | 5,062,500 | 21,154,226 | 23.90% |
| 2010 | 7,786,700 | 21,959,278 | 35.50% |

Table 3 – Evolution of the number of Internet users in Romania between 2000-2010; source: Internet World Stats

In Romania, the leading Internet service providers are RCS & RDS, a company that in December 2009 had about 1.1 million subscribers, UPC Romania and Romtelecom, operators that at the end of June 2010 registered more than 880,000 customers, respectively 263,600 customers. At the end of 2009, there were 2.82 million Internet connections to broadband for fixed points, an increase of 12% of the 2.51 connections at the end of 2008. According to ANCOM, that the number of connections for broadband Internet access for mobile points was of 2.76 million in December 2009 compared with 1.51 million two years ago.

The European Commission established by the Digital Agenda project that by 2013 all Europeans should have access to basic broadband services and that by 2020 to have Internet at speeds higher than 30 megabits per second, and at least half of EU households to be subscribed to Internet of more than 100 megabits per second. Europe has an average level of broadband usage of 24.8% and the investments to expand broadband Internet penetration exceed 270 billion euro.

*The profile of the Romanian Internet user*

According to data published by the Romanian National Institute of Statistics, in 2010, 50.2% of the people between 16 and 74 years old have used a computer at least once.

Use of computers and Internet is differentiated by characteristics like occupation, age, sex, educational level, place of residence.

Following the characteristics of the activities performed, from the employed persons, the employers and employees use the Internet to a higher extent (78.8% and, respectively, 63.3%), while own-employed workers (category dominated by farmers) are access Internet much less (16.2%). Remarkable differences could be seen among inactive persons, pupils and students register the highest percentage of all socio-occupational categories (91.1%), in contrast to the proportion of retired persons (9.1%).

It could be considered that generally women and men have similar preferences in terms of Internet activities. However, men show significantly higher weights for leisure activities (62.5% of men compared with 51.1% of women), downloading software (33.4% male, compared to 27.8% women), downloading/ reading online publications, while women show higher weights for health information (58.8% versus 46.5% among men) and training and education (48.0% of women compared to 43.0% men).

Households' access to information and communication technology is still at the extensive development stage in Romania, and there is and noticeable increase trend from one year to another. Currently, about 45% of households owe computers and less than 40% of them have home Internet access. Endowment of households with computers and Internet access has an uneven development. If 59% of urban households owe computers, in rural areas the proportion is much lower, 24%. In terms of Internet access, disparity is even more evident. If one of the two urban households has access to the Internet from home, for rural households only one of six has Internet access.

The most wide spread Internet access is through personal computer and the connection type is mainly broadband connection.

Of the total people between 16 and 74 years old in Romania, 50% use or have ever used the computer and 44% currently access Internet. Most of the people use Internet access at home or at work. The main purposes of using the Internet are: using electronic mail, searching information about products and services, downloading games, music and movies. Internet commerce is still underutilized, only one in six users call to this feature.

In conclusion, it could be considered that use of computer and Internet in households in Romania has a great interest and is in continuous development.[15] However, Romania's progress and use of opportunities in the information society are far from satisfactory. Delays are mainly related to access to Internet, information society services and update of applications in economy. Significant gaps in infrastructure are remediable only through major investments, both from private companies and public institutions.

*B. European Funds Allocated to Romania Regarding the Development of Information Systems for e-Government*

In Romania, Sectoral Operational Programme Increase of Economic Competitiveness (SOP-IEC: Axis 2 – "Increasing economic competitiveness through research, development and innovation (RDI)" and Axis 3 – "Information and communications technology for public and private sectors.") financed through European Regional Development Fund (ERDF) support investments in competitiveness. Priority Axis 3 "ICT for private and public sectors" provides financial assistance for:

a) supporting the ICT use that include access to Internet and to connected services, support for setting up broadband networks and connections;

b) developing and increasing the efficiency of electronic public services by support in setting-up of e-government, e-health, e-learning solutions, ICT solutions to increase the information systems' interoperability;

c) sustaining the e-economy for integrated ICT business systems and other electronic business applications, development of e-commerce systems and other Internet based solutions for businesses.

Regarding the development of e-government, especially at local administration level, financial aid will be granted to provide support for the implementation of several computer applications that will be used both by individuals and especially by businesses. So far e-government development has been hampered by poor infrastructure and lack of interoperability between various software applications used by local and central administration. Improving the competitiveness of Romanian companies will by provided by increasing the number and quality of electronic public services such as electronic signature, payment fees and taxes, issuing permits, etc. All these electronic services related to e-government will contribute to reducing costs and time taken to pay fees and taxes, simplifying administrative procedures, reducing bureaucracy, etc.

The e-Romania site is part of the "National Strategy for Romania Digital Information Society - e-strategy" and is divided into areas of national interest that include 20 programs designed for individuals and companies. The purpose of this portal is to improve the efficiency of the government system by streamlining administrative procedures and reduce bureaucracy and also to increase transparency of government and administrative procedures. Interest areas covered in the

national site e-Romania are: e-Health, e-Environment, e-Transport, e-SMEs, e-Agriculture, e-Justice, e-Learning, e-Culture, e-Church e-Travel, e-Join, e-Sports, e-Citizen, e-Civil servants and e-Statistics. The cost for implementing the strategy of e-Romania only for 2010-2013 is estimated at around 500 million euro (out of which 60% will be covered by European funds), this portal aiming at the interconnection of all public administration systems and provide approximately 600 electronic public services by 2013. The following table shows the structure of financing on project's components during 2010-2013.

| Financing Type | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|
| Central Budget | 35% | 25% | 15% | 15% |
| - which co financed | 20% | 20% | 15% | 15% |
| Local Budget | 10% | 20% | 15% | 10% |
| Irredeemable EU funds (structural funds) | 50% | 50% | 50% | 50% |
| Other irredeemable EU funds | 5% | 5% | 10% | 10% |
| Other irredeemable funds (World Bank) | 0 | 0 | 10% | 10% |
| Private financing | 0 | 0 | 0 | 5% |

Table 4 – The financing structure, by components and by years; source: [16]

"For the component <<irredeemable funds>>, primarily the focus is aimed at structural funds managed by the SOP-IEC (increase of economic competitiveness) and SOP-HRD (human resource development)."[16]

The "Platform for the integration of e-government in the National Electronic System" is part of the site e-Romania and was filed in November 2008 under SOP-IEC, being financed by European funds through Operation 3.2.1. "Support the implementation of e-government solutions and connecting to broadband, where necessary", selected for funding in July 2009. The general objective of this project whose implementation started in September 2010 is to increase the quality of services provided by the central public administration to citizens, businesses and public institutions. The total project value is approximately 4,615,000 euro, out of which approximately 3,800,000 euro are grants. The implementation of this project at a national level aims to achieve an information platform in order to implement an electronic Point of Single Contact (e PSC) and One-Stop Shop concept of electronic government.

The electronic PSC implementing the Services Directive 2006/123/EC of the European Parliament sets out how businesses of all EU Member States will be able to get online the permits necessary to develop economic activities in Romania. Also the information system will allow running, through electronic means, the procedures and formalities necessary for registration, licensing and deployment of activities in Romania.

With the One-Stop Shop individuals and companies in Romania will be able to interact directly with the public administration through a single virtual desktop. This electronic system will allow citizens to access e-government services and facilitate the exchange of information and documents between public institutions, aiming at unification, reduction and electronic implementation of administrative procedures. "The project is well structured, but its implementation always needs the cooperation between institutions. Our goal is to offer citizens the best possible service", said the Minister of Communications and Information, Mr. Valerian Vreme in September 2010. The National Center "Digital Romania", under the Ministry of Communications and Information, promotes and manages projects aimed at developing electronic government services and public inter-institutional cooperation in an efficient e-government.

*a) e-Romania project - overview*

e-Romania project aims the development of a nationwide system through which online public services can be provided for individuals and economic entities with a unitary interface. This unitary national system that will provide on-line services to individuals and companies is based on the concept of "single access through a single point" to information and services in the portal e-Romania. This website is designed and built on several levels:

- The "e-Romania 1" is designed at a national level and contains information of general interest;
- The "e-Romania 2" is screened at the regional level and includes detailed information at local level and has several portals;
- The "e -Romania 3" is designed at a national level and ensures integration and interoperability of the two projects "e-Romania 1" and "e-Romania 2", a complete picture of the entire system at central level being provided.

The main objective of e-government is the modernization of public administration by strongly reducing bureaucracy within the administrative processes, which by default will lead to lower corruption (eliminating situations that favor its emergence and development). According to the 2010 report prepared by PricewaterhouseCoopers (PwC) and the World Bank, presently, a company in Romania loses about 222 hours to pay all taxes due to the Romanian State, 113 payments needed to be made. The development and implementation of the e-Romania project implies the de-bureaucratization of public administration and the "automation" of relations between economic agents and Romanian State's representatives, which will ultimately reduce costs and time spent in relation to financial administration.

Competitiveness of economic agents in Romania is also determined by institutional transparency and costs reduction when companies interact with authorities. These cost reductions for economic agents would have a base on the interaction with authorities through modules integrated in the e-Romania platform, among which:

- e-SMEs;
- e-Association;
- e-Environment;

- e-Tourism;
- e-Agriculture;
- e-Statistics.

The e-SME module implementation aims to provide electronic services for these companies and to develop the business environment in Romania through:

- Creating a page that contains complete and updated information to support SMEs;
- Supporting companies by providing the legal and institutional framework that govern their ongoing activities;
- Developing the potential of economic agents;
- Ensuring transparency of interactions between companies and public administration
- Increasing the number of eligible projects submitted by SMEs on European funds grants
- Increasing the absorption degree of European funds.

The main reasons why SMEs need to invest in the implementation of ICT are very visible in the article [17]. According to these authors there are three key reasons for SMEs to invest in ICT: "First, information and communication technologies can improve the ways they produce, market, buy and sell their goods and services (…) Second, ICTs can help level the competitive playing field between developing and industrialized economies (...) Third, electronic business – retail and business to business – is growing substantially despite the dotcom companies staggering a few years ago. And it's not just business – governments are getting in on the act. A solid investment strategy in "e" can help SMEs enter new markets and overcome or sidestep many traditional obstacles they face while competing internationally".[17]

The e-Association module will focus on encouraging and easing the achievement of various forms of association between economic agents to realize the successful implementation of large projects. This will be supported by:

- Providing free access to official documents in terms of association for all interested economic agents;
- Offering the chance to get in touch and find the best forms of association to any company that operates in a specific area;
- Creating a national map through which firms will be presented at a regional level depending on their area of activity and economic indicators obtained as a result of their activity (turnover, indebtedness, income, etc.);
- Providing of continuously updated information about existing funding opportunities at a given time to firms who operate in different fields.

The e-Environment module will provide electronic services to Romanian companies for waste management and environmental activities, in accordance with the law. The e-Travel module will result in creating a Single Tourist Information Centre at a national level, aiming to providing information and quality services to tourists in order to increase their number. The e-Agriculture module aims at providing agricultural information and consultancy to Romanian economic agents working in this field. This will provide updated information about funding opportunities through national funds and EU funds, summary information related to agriculture, etc. With the e-statistics module companies will have access to centralized updated statistical data with a high degree of accuracy, which will help in the process of making more realistic business plans and developing strategic programs.

Developing and implementing of all appropriate modules for the e-Romania portal proves to be more important for the country and for the Romanian economy as online availability of public services is at a much lower degree in Romania than the average in the EU27+ (27 EU Member States plus Croatia, Iceland, Norway, Switzerland and Turkey). As it is shown in the "Digital Agenda: more EU citizens benefitting from online public services", online availability of public services in Romania in the year 2010 saw a significant increase (from about 50% to about 60%), still being well below the average level of online availability (82%) of public services registered in the EU 27+.

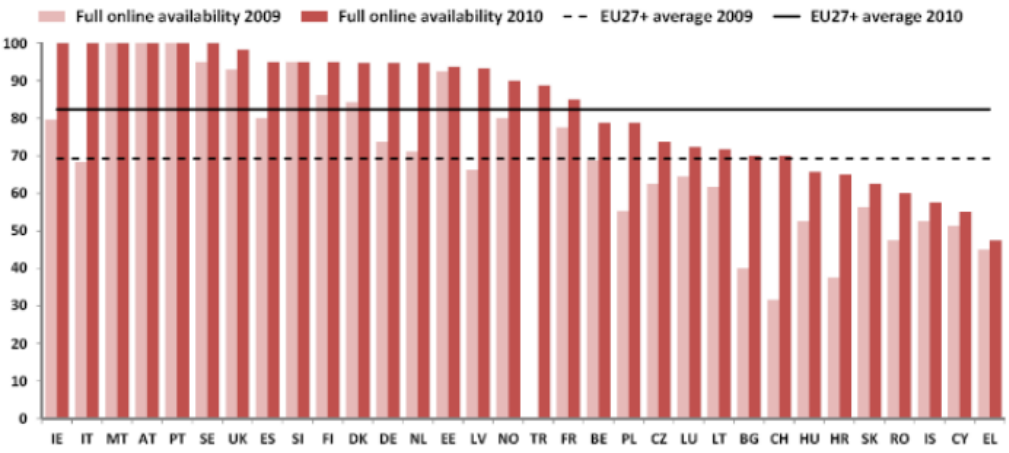


Fig. 8 – Full Online Availability, 2009-2010 (%); source: [18]

*b) The impact and the interventions of the EU funds allocated to the implementation of information technology and communications in Romania*

The potential impact that EU funds allocated to the implementation of information technology and communications can have on Romanian companies is strong, it can contribute effectively to the sustainable increase of their productivity and competitiveness. Moreover, the objective of the Priority Axis 3 – "Information and Communications Technology (ICT) for public and private sectors" of the Sectoral Operational Programme Increase of Economic Competitiveness (SOP IEC) is the strong capitalization of the

ICT potential by the public and private sectors in order to increase productivity by approximately 5.5% annually until 2015, when a productivity level of about 55% of the EU average is desired. For this purpose approximately 15% of the total funds SOP IEC have been allocated for Priority Axis 3, meaning 383 million euro from European funds plus 86 million euro from the Romanian State budget.

Priority Axis 3 of the SOP IEC is divided into three major areas of intervention, each of which is structured on several types of operations:

- Key Area of Intervention 3.1 – "Supporting the use of ICTs" aims at supporting access to broadband and is divided into the following operations:
  - Operation 3.1.1 – "Supporting access to Internet and to connected services" is addressed to SMEs and NGOs and aims at providing grant financial assistance for Internet connection to the global network via broadband, while fostering the acquisition of ICT equipment (servers, computers, laptops, etc.) and software packages (operating systems and office systems, purchasing and implementing electronic signature solutions, etc.);
  - Operation 3.1.2 – "Supporting local authorities for setting up a broadband networks and Public Internet Access Points (PIAPs) in the market failure areas (under-served rural and small urban areas)" is meant for local public administration to facilitate Internet access in rural and small urban areas;
  - Operation 3.1.3 – "Supporting SMEs for setting up a broadband network and PIAPs in the market failure areas (under-served rural and small urban areas)" is addressed to SMEs operators and providers of public electronic communications networks;
  - Operation 3.1.4 – "Supporting broadband connections for schools" is addressed to the Ministry of Education and aims at connecting schools to the Internet and providing them with servers, computers, printers, etc.
- Key Area of Intervention 3.2 – "Developing and increasing the efficiency of electronic public services" targets to increasing economic competitiveness and benefits arising from the interaction of public and private sectors, consisting of the following operations:
  - Operation 3.2.1 – "Supporting the setting-up of e-government solutions along with the necessary broadband connectivity (if the latter is needed)" is addressed to local and central public administration and intercommunity development associations, to implement e-governance solutions at local and central level;
  - Operation 3.2.2 – "Supporting the setting-up of ICT solutions in order to increase the information systems' interoperability" is addressed to the same beneficiaries as Operation 3.2.1;
  - Operation 3.2.3 – "Supporting the setting-up of E-Learning solutions" is meant for the central and local public authorities, intercommunity development associations and accredited public universities and aims at increasing the dissemination of information and professional skills by implementing e-learning applications;
  - Operation 3.2.4 – "Sustaining the setting-up of the e-health solutions along with the necessary broadband connectivity (if the latter is needed)" addresses to the Ministry of Health and health institutions subordinated to it, supporting projects for implementation of these services and electronic e-health applications in order to increase interoperability between the various medical units and the Ministry of Health.
- Key Area of Intervention 3.3 – "Sustaining the E-economy" aims to increasing the effectiveness of companies activities through the reorganization of their activities with the support of the information system, the introduction of modern ICT systems (ERP, CRM), e-commerce development, etc. This key area of financial assistance is provided through the following operations:
  - Operation 3.3.1 – "Support for integrated ICT business systems and other electronic business applications" is addressed to companies and aims to providing financial assistance to implement:
    - ERP Systems (Enterprise Resource Planning);
    - CRM Systems (Customer Relationship Management);
    - computer systems for economic analysis and decision support systems (business intelligent systems).
  - Operation 3.3.2 – "Sustaining the development of e-commerce systems and other Internet based solutions for businesses" is addressed to companies and aims at providing financial support for implementation of computer applications, as following:
    - information systems for electronic commerce;
    - information systems for electronic procurement;
    - information systems for secure electronic transactions;
    - information systems for e-payment;
    - e-learning systems for SMEs;
    - information systems for development of company's activity like Business 2 Business, Business 2 Customer.

As it is presented we can say that the impact of EU funds allocated to development of e-government services at regional and national level proves to be significant given that the allocated funds are used through feasible projects, local and central authorities make real and consistent efforts in order to reduce bureaucracy in the administrative act and to increase the number of online public services offered to individuals and businesses, and economic agents make every effort to implement projects using EU funds.

## IV. Conclusion

In the field of Information and Communication Technology (ICT), innovation is everywhere. Globalization is enhanced by applying ICT, following a strong impulse on innovation, creativity and competitiveness in the economies of all countries. Information infrastructure connects people, organizations and devices through innovative tools such as personal computers, mobile phones, servers, sensors.

Information technologies can be used as tools to revitalize urban and regional development. The industries in the field create added-value by exploiting and linking cultural diversity, and in the same time public administration must strive to make use of the new technologies, so that information become as accessible as possible. Various public programmes are developed and allocation of public funds is made to enhance ICT usage in relation to public administration services.

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## REFERENCES

[1] S. Marginean, "Globalisation and regionalization", University „Lucian Blaga" from Sibiu, the Faculty of Economic Sciences – course notes [Online]. Available: http://economice.ulbsibiu.ro/rom/studenti/cursuri

[2] P. Martens, A. Dreher and N. Gaston, "Globalisation, the global village and the civil society", *Futures*, No.42, 2010, pp. 574-582 (ISI Thomson).

[3] M.S. Lodhi, P. Mikulecky, "Knowledge Management Implementation in Public Services", *International Conference on Communication and Management in Technological Innovation and Academic Globalization (WSEAS Conference, COMATIA `10)*, Puerto De La Cruz, Tenerife, November 30-December 2, 2010, pp. 104-108 (ISI Thomson Proceedings).

[4] E. Mititel, "The Importance of Innovation in Developing and Orienting Companies in the Global Economic Crisis", in *Proc. of the International Conference on Economics and Administration 2010 (University of Bucharest, Romania)*, June 4-5, 2010, pp. 388-394.

[5] A. W. Little and A. Green, "Successful globalisation, education and sustainable development", *International Journal of Educational Development*, No.29, 2009, pp. 166-174 (ISI Thomson).

[6] D. Nica, "European Union in information society and globalization era", [Online]. Available: http://www.mdrl.ro/_documente/info_integrare/romania_si_viit_europei/informatizare.htm

[7] J. Lee, "10 year retrospect on stage models of e-Government: A qualitative meta-synthesis", *Government Information Quarterly*, No.27, 2010, pp. 220-230 (ISI Thomson).

[8] D. Litan, "E-Government – fundamental background and implementations", in *Proc. of the Ninth International Conference on Informatics in Economy (The Bucharest Academy of Economic Studies, Romania)*, May 2009, pp. 449-454.

[9] J. Komarkova, K. Langrova, P. Sedlak, "Evaluation of Development of Information Society and Participation of the Citizens in the Czech Republic by means of Spatial Methods", *Proc. of the 12th WSEAS International Conference on Computers*, Greece, 2008, pp. 880-885 (ISI Thomson Proceedings).

[10] E-government statistics [Online]. Available: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/E-government_statistics

[11] W.E. Ebbers, W.J. Pieterson and H.N. Noordman, "Electronic government: Rethinking channel management strategies", *Government Information Quarterly*, No. 25, 2008, pg. 181–201 (ISI Thomson).

[12] S. Sirkemaa, "Towards Integrated Electronic Services in Public Sector", *14th WSEAS International Conference on SYSTEMS (Volume II)*, Corfu Island, Greece, July 22-25, 2010, pp. 766-770 (ISI Thomson Proceedings).

[13] E. Al Nagi and M. Hamdan, "Computerization and e-Government implementation in Jordan: Challenges, obstacles and successes", *Government Information Quarterly*, No.26, 2009, pp. 577-583 (ISI Thomson).

[14] M. A. D. Marinescu, "Aspects of Globalisation in Developing Human Capital through Public Funded Projectss", in *Proc. of the 15th IBIMA International Conference on Knowledge Management and Innovation: A Business Competitive Edge Perspective, International Business and Information Management Association*, Cairo, Egypt, November 6-7, 2010, pp. 538-545 (ISI Thomson Proceedings).

[15] "Public access to information and communications technology in 2010", *Romanian Statistics Journal,* National Institute of Statistics, Romania, November 2010.

[16] *Official Gazette of Romania*, Part I, No. 276/ April 28, 2010.

[17] V. O. Robescu, D. Popescu, G. Popa, I. Barbu, D. Goldbach, D. Alexandrescu, "Traditional business versus e-business in Romanian's SMEs", *Recent Advances in e-Activities, Information, Security and Privacy* (Proc. of the 8th WSEAS International Conference on e-Activities (E-ACTIVITIES '09), Proc. of the 8th WSEAS International Conference on Information Security and Privacy (ISP '09)), Spain, 2009, pp. 194-198 (ISI Thomson Proceedings).

[18] Europa, the official site of the European Union [Online]. Available: http://europa.eu

[19] M.E. Porter, "Clusters and the New Economics of Competition", *Harvard Business Review*, Vol. XI-XII, 1998, p. 78.

[20] Department of Communications and Information Society - Romania [Online]. Available: http://www.mcsi.ro

[21] National Electronic System [Online]. Available: http://www.e-guvernare.ro

[22] European Cluster Observatory (Beta) [Online]. Available: http://www.clusterobservatory.eu

[23] Europa Press [Online]. Available: http://europa.eu/press_room

[24] Competitiveness and Innovation Framework Programme (CIP) [Online]. Available: http://ec.europa.eu/cip

[25] Management Authority for Sectoral Operational Programme "Increasing Economic Competitiveness" [Online]. Available: http://amposcce.minind.ro

[26] Ministry of Economy, Trade and Business - Romania [Online]. Available: http://www.minind.ro

[27] Digital Agenda: more EU citizens benefiting from online public services, Brussels, February 2011, [Online]. Available: http://europa.eu

[28] National Institute of Statistics, Romania [Online]. Available: www.insse.ro

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- Continuous Improvement in Implementing Public Funded Projects, *Proc. of the 17th IGWT Symposium, Facing the Challenges of the Future: Excellence in Business and Commodity Science*, Bucharest and Poiana Brasov, Romania, September 2010, pp. 377-381.
- New Approaches of Six Sigma in Designing and Managing Public Funded Projects, *Proc. of the 2nd International Conference "Vallis Aurea"*, Pozega, Croatia, September 2010, DAAAM International Scientific Book 2010 (ISI Thomson), pp. 1041-1045.
- Best Practices in Implementation of Public Funded Projects in Romania, *Proc. of the International Symposium Sustainable Development in Conditions of Economic Instability*, Commercial Academy, Satu Mare, Romania, June 2010, *Journal "Quality – Access to Success", vol. 11, no. 113 special/2010*, pp. 1505-1512.
- Considerations on Monitoring and Evaluation of Public Funded Projects as Part of Their Implementation, *Proc. of the 4th International Conference Present Issues of Global Economy*, *Ovidius University Annals, Economic Sciences Series, vol. X/2010*, Constanta, Romania, pp. 1123-1127.
- Implications of Globalisation in Management of Public Funded Projects, *Proc. of the International Conference "Knowledge and Communication in the Globalisation Era,"* Targu Jiu, Romania, April 2010, *Annals of the "Constantin Brancusi" University of Targu Jiu, Letters and Social Sciences Series, Issue 2/2010*, pp. 303-316.

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- The Importance of Innovation in Developing and Orienting Companies in the Global Economic Crisis, *Proc. of the ICEA – FAA, International Conference on Economics and Administration, organized by Faculty of Business and Administration, University of Bucharest*, Romania, 4-5 June 2010.
- The Role of Innovation in Romanian Statistical Field – Key Factor in Meeting Users´Needs," *Proc. of the 1st International Conference in Romania on Information Literacy, organized by "Lucian Blaga" University of Sibiu*, Romania, 21-23 April 2010.
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- "The Efficiency of Enrepayable Funding Against Crisis Effects in Romania", *Journal of Modern Accounting and Auditing*, ISSN 1548-6583, 2010;
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