Innovation in "Globalization Era" – Development and Implementation of Information Systems Financed from European Funds

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Abstract: - "Globalisation 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. The "information society" includes main components such as electronic documents, internet network and provided services, electronic libraries, virtual libraries, multifunctional information centers for citizens, distance learning facilities, electronic commerce and electronic payments, mobile telecommunication, online governmental services etc. Because the new technologies allow access, processing, storage and transmitting information at an increasing cheaper and easier way, governments, in turn have to adjust the flow of their activities properly with the new "information era", propelling and sustaining financially and in terms of research the e-government information systems. Public programmes are developed to stimulate "new economy" development and increased amount of funds are allocated to this sector in addition to private investments, recognizing the significance and scale of the latest developments leading to a digital society.

Key-Words: - e-government, European funds, globalization, information system, information technology, innovation

1 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."[www1]

"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."[1]

The main factor that led to the phenomenon of globalization was *the development of new information technologies*. Other elements have 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.

1.1 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, 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".[2]

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.

1.2 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"[3] 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 conduct 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.

2 The e-Government, the "Response" of the Public Administrations to the 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."[4] "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."[5] The main types of e-government information systems in the developed world fall into two categories:

a) *information systems dedicated to the interaction between citizens and state institutions*. This category includes the following systems: Income Taxes, Social Security Benefits, Personal Documents, Car Registration, Application for Building Permission, Declaration to the Police, Birth and Marriage Certificates, Enrolment in Higher Education, 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, etc.

However, the percentage of the citizens who prefer using the traditional communication channels (the phone, the front desk or the fax) 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 aspect: 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).

2.1 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 and 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."[www2] 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.

We suggest the possibility that the factors that influence negatively 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 should be "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, Internet, newspapers;
- the development of educational campaigns for the citizens on how to the use of e-government information systems by means of the communication channels: radio, TV, Internet, newspapers.

2.2 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."[6]

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;
- 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.

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*.

3 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.

3.1 A Short 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."[7]

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).

3.2 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 administrations. 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 1 - The financing structure, by components and by years; Source: [9]

"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)."[9]

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 (PSC e) 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.

4 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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