

Multi-channel Delivery of Services – the Road from eGovernment to mGovernment: Further Technological Challenges and Implications

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Abstract: *During the last decade, users have become accustomed to new means of service delivery in the private sector. Nowadays, users expect the same level of variety from the public sector: they want their interactions to be convenient, and they prefer to be online rather than inline. New developments in ICT along with the growth of mobile communication allow the involved sectors to meet these challenges by reengineering their front-end and back-end office. They have developed new ways of interaction through a variety of channels allowing users to consume their services anytime, anywhere and anyhow, restructured services that accommodate their users' needs, and re-organized processes within and between separate administrative bodies. This paper will examine the interaction requirements regarding a friendlier and more effective multi-channel services environment, the mobility challenges and their apt implementation in the governmental sector placing emphasis on the technological constraints of an mGovernment open interoperable multi-services delivery infrastructure and the impact of its single-point of access functionality across the borders of the new digitally integrated Pan-European reality.*

Keywords: Multi-channel, eServices, eGovernment, mGovernment.

1. Introduction

eGovernment has been on the international agenda for several years. The development in Europe suggests a potential for more efficient and user-centered ways to deliver public-services. Thus, awareness by users of these services, their willingness to use them, ease of use and delivery of benefits with the services are important factors in the developments of eGovernment (SEC 2003) and ultimately of the mGovernment. eGovernment services have been launched or implemented by most of the European Member States and the rate of initiatives is continually evolving. Two different strategies for improvement of services are identified, *process integration* (back-end) and *service delivery* (front-end). The first one refers to the degree to which the service is reengineered in the transformation from an off-line service to e-service, while the second refers to the channel and distribution strategies in the provision of government services (Top of the web, 2003). Relevant channel and distribution strategies are critical for future advancement of e-services to achieve accessible, customer-focused and responsive services. Following the growing user demands and requirements as well as the rapid development of the technological advancements and infrastructure capabilities the development of e-services should not only focus on making the service available on the Internet, but also examine the different delivery platforms. A multi-channel (WAP, MMS, SMS, Web, Satellite etc.) and a multi-device (PC, mobile phones, PDA, tablet PC, Satellite handset etc.) access mix will improve the e-Inclusion and the access of the services offered, since will be available anytime, anywhere and anyhow through a single point of access entry (One-stop-Government). Indisputably, this is the vision of an interoperable, transparent and secure continent whereby multi-channel service delivery integration is considered fundamental.

New communication platforms beyond PC-based Internet access are now becoming available allowing the involved sectors (private and public) to meet these challenges by reengineering their front and back office and business processes, implementing new ways of interaction through a variety of channels (i.e. interactive digital television and third generation (3G) mobile systems driven by common standards open up

possibilities for multiple platforms access to services), and restructuring services that accommodate their users' needs. "Two new developments will have a major impact on the further development of the Internet: multi-platform access / convergence and broadband" (eEurope 2005 Action Plan, 2002). Broadband stimulates the use of the Internet and enables the usage of rich applications and services. Its benefits emphasize in the areas of e-business, e-learning, e-health, and e-government, improving the functionality and performance of those services, and further extending the use of the Internet.

eGovernment aims to deliver better quality of public services that are accessible for all. It aims to increase the productivity in the public sector, so that services can be provided by various channels, at a lower cost and time and in a personalized style. Mobile telephony could be considered one of the most challenging channels. It becomes more relevant considering the much faster growth of mobile penetration rate compared to desktop based Internet access, a factor which can play a considerable role in bridging the digital divide. The use of mobile devices in delivering eGovernment services has been created a new research area called mobile government (mGovernment). From a citizen perspective, mobile government stands for a new kind of front-end access to public services that have been made available specifically for mobile devices or adapted from existing eGovernment applications (Europe's Information Society, 2004).

The aim of this paper is to analyze and present concepts and arguments that will have to work in a coherent and cohesive way towards the provision of eGovernment services via multi-channel mediums without losing their integrity or quality of their content. Extensive reference will be made to the broadband and mobile advancements since are considered vital elements to the successful implementation of the "anytime, anywhere and anyhow" notion advancing at the same time the mGovernment research dimension. The aforementioned two could be characterized as the major enablers of the reengineering process and methodologies towards an integrated, interoperable and transparent open multi-channel service delivery architecture.

The paper is structured in 6 sections. Section 2 presents roughly the role of eGovernment and gives an overview of the user service requirements and service delivery aspects. Section 3 outlines the emergence of mGovernment. Section 4 refers to the core characteristics of an open service platform for mGovernment. In Section 5 the reengineering process need is described and its impact for the Pan-European services delivery is revealed, and section 6 concludes this paper.

2. The Role of eGovernment – Service Requirements and Delivery

eGovernment is a central element in the eEurope 2005 Action Plan. It is defined as "the use of information and communication technologies in public administrations combined with organizational change and new skills in order to improve public services and democratic processes and strengthen support to public policies" (COM 2003). Its primary concern is the delivery of better quality public services that are accessible for all, and the increase of the productivity in the public sector, so that services can be provided at a lower cost and less time for more personal interaction through a 'single point of access' gateway. It also seeks to use new service channels (i.e. and fax, Internet, kiosks, WAP, mobile, digital TV), new infrastructure (multi-platform capabilities) and technologies (i.e. broadband) that will enable transparency, accountability and openness of the public institutions reinforcing that way the richer and more direct information interaction and retrieval.

The strategic theme guiding the whole process is "To struggle against the amplification of the digital divide and the therefore to think 'user interaction' whatever the age, income, education, experience, and the social condition of the citizen" (Europe's Information Society, 2004). In many ways, the new technology, as mentioned in the introduction, provides greater opportunities for access, facilitating the need for user centered service development and delivery. However, there are important problems in determining precisely what citizens want and need, and how to provide eGovernment services in user-friendly and effective way.

User needs are always conditioned by what they already get, or imagine they can get. The most prominent approach to collect this type of information is focused upon the users' level segmentation and providing them consequently personalized and adaptive services depending on their preferences (section 4.4 makes an extensive reference regarding this issue). This methodology has an extensive application on the services delivery via mobile channels whereby the presentation and nature of information are restricted from the capabilities of the devices.

2.1 General User Requirements

To get the right information at the right time and the right place is not so easy for the users. The involved sectors, both private and public, working at their front or back office, they have encountered in several times and occasions the particular problem. Users' interaction with the services has to be improved, and a serious analysis of user requirements in the area of eGovernment has to be undertaken and documented and furthermore examined taking into consideration their multi-application to the various delivery channels and devices.

This paper will present, based on studies conducted (IDA, 2004; Top of the web, 2003; PRISMA, 2002; CAP Gemini Ernst & Young, 2004), some of the user requirements and arguments anticipated. They could be clearly distinguished into:

- General user service requirements.
 - *Flexibility: anyhow, anytime, anywhere.* (a) Technological developments have introduced a wide variety of new channels over which different forms of contact can take place (i.e. web technology, has introduced e-mail, which in many situations has replaced regular mail, or has opened the possibility of consuming services by means of self-service on a 24x7 basis; moreover, mobile technology makes it possible to consume services irrespective of location). (b) Many service delivery processes consist of two more interaction sessions between the user and the involved sectors (i.e. if the administration is flexible in terms of its service delivery, it will allow the user to choose the channel or location for the interaction processes, and allow him to switch between channels at any preferable time).
 - *Accessibility.* (a) Users should be able to locate the required services (awareness). (b) Users should be able to identify the channels that they can use to access the service they need (i.e. provide help to the users regarding the channel most suitable for them to use). (c) Once a service is located and accessed, users should be able to consume the information provided by the service and it should be usable to all members of the intended user community. (d) The legal basis of public services stipulates that they must be accessible for all potential users. (e) A pricing policy for services should guarantee that the intended target groups can afford the services.
 - *Quality.* (a) There are many situations in which a user needs more than just one service to deal with a particular situation. In a one-stop shop approach (Herbert & Hagen, 2000), a single interaction would be able to address all requirements, thus saving the user considerable amount of time. (b) Public services are usually regulated by means of strictly defined specifications. Quality can be described as satisfactory if the service is provided in conformance with the relevant specifications. (c) In user-centric approach, services must be offered pro-actively. A timely service is a service that is offered at the moment a user may need it, even though he may not yet be aware of it. (d) Quality comes at a price (i.e. faster delivery of a service may involve more costs than delivery at a regular speed).
 - *Security.* (a) A trusted exchange of information depends on an assured security level. If a channel is not secure, or if users don not trust its security, the channel will not be used for services that involve sensitive information. (b) Security is not only a technical matter, it is also one of perception. Due to a lack of trust in security matters, relatively large segments of the user population are less inclined to use channels that they do not fully trust, especially when payment is involved.
- Requirements for a friendly and effective user interaction.

- *Information Acquisition*. Support active involvement.
- *System Controllability*. Give the users the control.
- *Navigation*. Provide easy means for navigation and orientation.
- *Versatility*. Support alternate interaction techniques.
- *Errors*. Tolerate user's errors and support error system-based and context-oriented correction of user's errors.
- *Personalization*. Enable customization of multi-media and multi-modal user interfaces to particular user's needs.

The convergent perception of many studies seems to be that users are different in their perceptions, reactions, and demands. In addition, it is almost universally accepted that, "where misunderstandings in a human-machine interaction are possible, then misunderstandings will occur" (Europe's Information Society, 2004). Therefore, a consistent optimized approach incorporating all the positive and negative outcome viewpoints is considered vital for the most optimum fulfillment of user needs.

2.2 Multi-channel Service Delivery

As can be observed from the users' requirements above, it is difficult to draw a clear line between a service (product) and the means of service delivery (channel). A channel can change the users' perception of a service. When a user has a free choice between different channels to access a service, he will choose the channel that realizes the highest relative value for him, by means of a high quality, accessibility, flexibility, and cost-efficiency and effectiveness. On the other hand, to increase the value of its service, a provider, should have its service processes and delivery channels more integrated, i.e. by re-organizing its organizational structure or by a more intensive cooperation between its internal and external departments. If channels are integrated, the introduction of a new channel is not merely an additional channel but a new opportunity to improve service delivery. With regards to the user, the integration of channels means more accessible and more flexible service delivery (which leads to better services).

Separate development of different channels for a single service (multi-channel delivery) can lead to inconsistencies such as different data formats or interfaces. To overcome the drawbacks of multiple-channel service delivery, the different channels should be integrated and coordinated (Caldow, 2001). To enable this, the common data that are used by the *front office* applications should be stored centrally so that they can be shared by the applications. Storing data centrally means that they need to be collected only once and that they can be accessed by back office applications. When data are stored centrally, users can also access the services they want from the location(s) and medium they want (desktop or mobile), as all the relevant information retrieval is taking place from the same databases. When *back office* processes are also integrated, full service integration becomes possible, which raises the quality and number of services significantly.

2.2.1 Channel Selection

A channel could be defined as "a means for users to contact public administrations (inbound) or for public administrations to contact their users (outbound) with the aim of acquiring or delivering public services. This includes the use of web-based technologies, telephony, paper media or face-to-face contacts; applications of these technologies such as the internet, e-mail, SMS, call centers or the counter; and devices to access the applications such as a personal computer, mobile phone, kiosk or digital TV" (IDA, 2004).

Services can be delivered through a wide variety of channels (the term 'channels' is often used as a concept that includes 'channel type', 'technology', 'platform', 'media', 'device' and 'touch point'). As in previous sentences have briefly been mentioned certain channels are more suitable than others for meeting particular user requirements. Factors such as cost and management make it impractical for an organization to implement all channels. A realistic set of channels must, therefore, be selected from the available range of potential channels. Since success in service delivery depends on a vast range of parameters, there is no

single formula or solution that fits all situations. However, there have been reported particular steps (IDA, 2004) that could guide a provider throughout the channel selection process. These could include:

1. Rate the features of the available channels.
2. Rate the service provision requirements for each service type.
3. Match the channel features and the service provision requirements.
4. Investigate the channel preferences of potential users and use the results to fine-tune the selection of channels that meets the general user requirements.
5. Determine whether the remaining channels are technically and organizationally appropriate to deliver the services.
6. Determine which channels will realize the best public value, based on (expected) costs and benefits.

Ultimately, it should be mentioned that the suitability and usefulness of channels depends on a range of factors, out of which technology is only one element. Additional features that could affect the service channels assessment could be: *directness, accessibility and inclusion, speed, security and privacy and availability*. To realize though their potential value, channels also need to be properly implemented and operated.

2.2.2 Channel Limitations

The Internet is today one of the most important information retrieval resources affecting directly the on going people's quality of life. The demand for service consumption anytime, anywhere and anyhow has emerged the evolvement of the wireless networks (wireless Internet) and mobile devices adding not only even more value to the specific medium but increasing at the same time the number of channels liable to convey the requested information. Since the number and variety of these channels (networks and devices) is really huge, with different capabilities and limitations, the design and implementation complexity is rising significantly. With regards to the networks some of the added issues and concerns are the low bandwidth, the unreliable connectivity, the lack of processing power, the limited interface of wireless devices and the user mobility.

The mobile devices have nowadays been proliferated dramatically and they are usually used to keep the users to a continuous interaction with the rest of the "world". In parallel to the wireless networks evolvement, they are also used to provide users with information and services on demand. Nevertheless, many restrictions and limitations characterize them not only because of their restricted computational power but of their small size as well. More specifically, one mobile device could be distinguished from a desktop one because of it's:

- *Size*. One mobile device must be small enough so to move easily and ideally.
- *Processor*. Usually mobile devices processors have less computational power and different architectural design.
- *Memory and Storage space*. The memory is significantly restricted due to the small size of a mobile device.
- *Screen*. The screen is of very small sizes with low resolution capabilities, that is why in many cases there are only monochrome panels.
- *Data entry*. Most of the mobile devices either they do not have keyboard at all or they have one of restricted size. Therefore, the data entry for processing becomes even harder. Additionally, in these devices could be inserted data via voice or image recognition techniques.

3. The Development of the Mobile Communication Sector – the mGovernment Emergence

Having therefore presented in previous sections all the multi-channel characteristics and peculiarities along with the service requirements and how these associated to eGovernment, and in many cases to

mGovernment, in this section it will be examined the closer correlation of this new research area. Even if it is quite clear so far the reason of its “birth”, it would be considered fundamental to emphasize more on its imperative existence, since in the future statistically the related channels will take over as the most sustainable mediums of services provision.

Mobile eGovernment could be considered as a new kind of front-end access to public services with specific capabilities of delivering on demand real time information. Nowadays, as an integral part of eGovernment, many governments start to offer eGovernment services via a variety of service delivery channels apart from the Web. One of this mobile service delivery channels is mobile telephony. This channel becomes more relevant considering the much faster growth of mobile penetration rate compared to desktop based Internet access. Moreover, the growth of mobile communications has had a profound economic and social impact in Europe and beyond. The mobile phone is now pervasive and is used in every human activity, private, business and governmental. While penetration levels are likely to continue to increase, the most significant future development will be the growth of mobile broadband services, as the potential provided by third generation mobile (3G) and its enhancements, as well by other wireless technologies, including RLAN, satellite and others, is realized. The dissemination of these technologies represents a paradigm shift that will enable the emergence of new data services, combining the benefits of broadband with mobility (COM 2004). Over the past year, European 3G mobile operators have launched commercial services in ten Member States, and more networks are expected in the following months. Looking forward, the convergence of telecommunications, broadcasting and internet will result in the proliferation of high speed multimedia services delivered over mobile networks. The 2.5G / 3G and R-LANs will co-exist and provide complementary services. Users can benefit from the high-speed wireless access when near a hot-spot, and receive 3G services over a wider area. Continued technological innovation will also affect other platforms which, in turn, may affect the development of 3G by giving a broader technology base from which new innovative services could develop to the benefit of all. The convergence of fixed and mobile services, for example, through unified fixed / mobile offerings, will also bring additional opportunities for innovation.

Eventually, the research environment has changed dramatically, since 1998, when ETSI adopted the UMTS standard for 3G. Global competitiveness is based on innovative capability as well as cost-efficiency. In order to maintain and improve competitiveness, Europe must focus on innovation as the primary driver of competitive advantage. Research in the mobile and wireless communications sector must necessarily address the entire value chain, from technology development up to the development of services and applications as well as content, taking into consideration the fact that the associated cycles of innovation, although interrelated and inter-dependent, are subject to different time constraints. Global standards and platforms for the development of innovative and high-speed mobile broadband services will be essential for creating an integrated global market and for enhancing competition.

4. Principle Drivers of an mGovernment Open Service Infrastructure

The deployment of an mGovernment open service platform that could be shared by networked private and public authorities and institutions could be a promising approach with further insights on maintaining wireless service provision sustainability in a long-term perspective. Wireless technology is about extending the availability of an eGovernment infrastructure to mobile and wireless channels. It becomes more fully developed and as bandwidth increases with the availability of “always on” connectivity, next generation applications and entirely new practices will arise different from those delivered over existing static networks (Caldow, 2001).

The large array of new communication technology opportunities, the rapid emergence and change of standards as well as the variety of mobile channels, offer different technical capabilities for sustainable architectures and technology frameworks in order to meet critical requirements like broadband, interoperability, scalability, transparency, personalization, privacy and security. For a more concrete

understanding, following, the paper makes a reference to the aforementioned critical aspects of an mGovernment open service platform in an attempt to highlight the reengineering imposition.

4.1 Broadband

Along with the multi-platform access / convergence, broadband is considered a new initiative that will have a unique impact on the further development of the mGovernment channels and infrastructure. There is no universally accepted definition of broadband, but its key characteristics are high speed and always-on functionality. Currently, broadband access is mostly offered over legacy infrastructures, in particular over the telephone network using ADSL technology, and over cable TV networks using cable modems. These technologies require the upgrading of existing networks as such, and therefore are expected to remain the dominant platforms in the short to medium term driving the transition to a more pervasive deployment of new infrastructure (such as fiber optic, fixed wireless access (FWA), third-generation mobile systems (3G), R-LANs, the next generation Internet Protocol (IPv6), satellite, powerline communications, space optics, etc.). Thereafter, it will appear the next generation of service delivery relying on these features. If fully exploited, broadband technologies will improve the effective use of networks, and thereby increase service quality and sustainability. Having anywhere, anytime, anyhow access to information will contribute to greater multi-channel delivery effectiveness and efficiency.

4.2 Interoperability

Interoperability is critical for the deployment of mobile broadband services. It is a multi-faceted issue and is necessary at various levels: device to network; device to device; network to network; and between content and / or applications. Without appropriate interoperability between different infrastructure and terminal solutions, the 3G reality could remain fragmented. Different services and terminals should be available for different types of users. The significance of interoperability will be revealed in the ability of a network and a terminal to support reliably the functions required for a given service or content. Users mostly prefer to have services and information tailored to their needs and requirements, while knowing that their right to privacy is protected and services themselves are secure.

In converging environments new challenges to achieving interoperability emerge. Converging technology means that new systems and services are developed with inputs from multiple industries, including telecommunications, broadcasting, Internet service provision, computer and software industries, where the meaning of and reliance upon standardization and interoperability differ. However, agreement on common standards and specifications is essential to support information sharing eGovernment services over a universal interoperability framework. Most Member States are already addressing this challenge by adopting national 'eGovernment Interoperability frameworks'. This is being complemented at European level by the development of the European Interoperability Framework "in support of pan-European eGovernment services to citizens and enterprises" (COM 2003). These services could be distinguished in three different levels (IST, 2003): (a) *Organizational (Application Interoperability)*, with interoperability issues to be focused on defining business goals and modeling business processes, (b) *Semantic (Semantic Interoperability)*, with interoperability to ensure that the exact meaning of all exchanged information is understandable by any application that was not initially developed for this purpose, and (c) *Technical (Enterprise Architecture)*, with interoperability to deal with the technical issues involved with linking computer systems and services and they are based on open standards (open interfaces, interconnection services, data integration and middleware, security services, etc.).

4.3 Transparency & Scalability

The provision of a public service may cross the boundaries of numerous different authorities or governmental departments, which necessitates the integration of their offered services (conventionally, users were required to complete related to the service tasks by visiting various departments), thus dealing i.e. with Public Administration as a whole, without knowing what department or agency provides the desired information or service, how it can be discovered and used. This involves the sound co-existence and

operation of interoperability mechanisms and processes amongst the diverse back-offices or different administrations. The service providers have to dynamically build and follow the workflow of these services, discovering and using semantics and supporting civil servants with knowledge management techniques (Europe's Information Society, 2004).

Moreover, towards the interoperability reality, new enterprise business requirements and constraints affect the design of software applications and systems taking into account parameters, like the number of concurrent clients that access the application, response times, transparency issues, transaction throughput, etc. Therefore, changes of these requirements are reflected in the actual design of the applications. As a result, in order to ensure the requested running efficiency and effectiveness it is considered necessary to grow with the business requirements adopting simple techniques that would keep the basic application architecture intact but would provide the desired scalability (i.e. through the use of clustering techniques, by simply adding or removing servers).

4.4 Personalization – Access Segmentation

It is an indisputable fact, that user population is not homogeneous, nor should be treated as such. To be able to deliver quality services, they should be tailored to the needs of individual users providing them personalized and adaptive information at the requested moment. Although one-to-one service provision may be a functionality of the distant future, user segmentation is a very valuable step in the right direction. User segmentation means that the user population is subdivided (ideally per service or group of related services), into more or less homogeneous, mutually exclusive subsets of users who share an interest in the service. The subdivisions are based on one or more user characteristics. These could be *demographic characteristics* (i.e. age, gender, urban or rural based, region), *socio-economic characteristics* (i.e. income, class, sector, number of employees, volume of business, channel access), *psychographic characteristics* (i.e. life style, values, sensitivity to new trends), or *individual physical and psychological characteristics* (i.e. disabilities, attitude, loyalty).

The issue of personalization is a complex one with many aspects and viewpoints that need to be analyzed and resolved. Some of these issues become even more complicated once viewed from a moving user's perspective, in other words when constraints of mobile channels and devices are involved (Panayiotou C., & Samaras G). Such issues include, but are not limited to, the following: *what content to present to the user, how to show the content to the user, how to ensure the user's privacy, or how to create a global personalization scheme*. In addition to these considerations, there are also many approaches and each one of them usually focuses on a specific area, i.e. whether this is profile creation, machine learning and pattern matching, data and web mining or personalized navigation. Eventually as clearly viewed so far, user characteristics, determining user segmentation and thus provision of the adjustable service information, differ according to the circumstances and they change over time. This is one of the reasons why users should be offered a choice of channels when they access services.

4.5 Privacy & Security

The emergence of mobile broadband channels and services include corporate and consumer applications involving personal and sensitive data. For these transactions a trusted and secure identification and authentication process is required. A common interoperable authentication framework is needed to ensure general purpose authentication throughout private and public service providers across Europe. More specifically, the following areas are identified with respect to mobile privacy and security research: Trusted platforms for mobile security and privacy; mobile network / transport security and privacy; mobile application security and privacy; mobile privacy an identity management; basic security and privacy technologies for mobile environments; mobile application security framework; and user centric mechanisms allowing controlled release of personal information (Europe's Information Society, 2004). Mobile communication-based authentication is well placed to serve as a basis, as it is already assisted by the universal availability of GSM networks and terminals across Europe.

5. The Reengineering Process and its Impact for Pan-European Services Delivery

“Integrated eGovernment will come to the fore when it is feasible and desirable to build a new architecture of ‘seamless government’, consisting no longer of range of ‘stove pipe’ organizations but of networks connecting ‘one-stop’ front offices to the back offices of services providers” (Leitner C., 2003). To achieve this integration and interoperable process across Europe through a single-point-of-access to personalized services anywhere, anyhow, and at anytime the involved private and public sectors should unquestionably progress to the re-organization of their processes and methodologies extending to the re-establishment and re-configuration of their front and back-offices. Re-design of processes is defined as reengineering of processes. In business literature business process reengineering (BPR) has been defined by the originators of the concept as the “fundamental rethinking of and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed” (Hammer M., & Champy J., 1993). This fundamental strategy (process reorganization or reengineering), applied to the private and public organizational functionality is driven by the need to increase efficiency and effectiveness providing a more flexible, collaborative, integrated, higher quality service delivery engaging at the same time more citizens.

Information Communications Technology (ICT) acts as an enabler allowing organizations to work in radically different ways, to share information, to break old rules and not only to create new processes but change existing ones simultaneously, being supportive to decentralization by means of, i.e. flexibility and customization. Moreover, there is a clear and strong link between reorganizing government back-offices and the electronic public services available to the people, in other words, between the front and back-office. The key to eGovernment and mGovernment success lies in integrating front and back-office systems and service delivery channels, but also in integrating services across organizational boundaries and across layers of government and other public institutions. The rationale behind reorganization of back-offices does not come from the belief, that simply replicating the old manual paper based processes will optimally make use of the technology. On the contrary it might even lead to increased costs. To fully make use of the technology, processes must be reengineered, checking what steps in the process are necessary, what steps could be changed or merged, that is, “changes in work flows or changes in the structure of one or more agencies involved” (Millard J. & I., & Jonas S., 2004).

Pan-European eGovernment services are meant to be cross-border public information and interactive services. The reengineering and development of a pertinent multi-channel approach for the delivery of mobile eGovernment services require further and continuous investigation examining thoroughly the feedback and impact constantly accumulated. The outcome of several studies conducted (IDA, 2004) provide an accurate guidance for the services to be implemented and the opportunities and technologies (wired and wireless) of a multi-channel approach for delivering such services. Some of the broad predominant current impact results of related applications implementation are: Direct access to web-based services information for a significant number of persons from multiple access points (i.e. kiosks, PCs); improved government services and image of public & private sector; access to multiple services due to the widespread of the mobile phones. The SMS medium is seen viable for the delivery of information and consequently conducive to a better quality of life for citizens. Since, in most countries, is a more cost-effective medium with respect to conventional medium, such as mail and fixed line telephony, the cost of delivering information is lower; the citizens save time and do not have to go to the local offices within a limited office hours to request a particular service (round-the-clock service); citizen satisfaction and ease of use, accessing several governmental departments through a single portal provided with information on demand (in many cases in a personalized format); submission of information in a structured format, by means of online forms with a considerable reduction of the turnaround time between the moment of submission and the response time (in many cases it is succeeded real time transmission of information); and finally, information is possible to be communicated immediately to the citizens after it has become available in a cost effective manner (just-in-time information).

Unquestionably, since the research and quality of findings are substantially progressing, new technologies, services channels and communication methodologies have to be incorporated to the existing architectures enhancing openness, directness, efficiency, speed and security and thereafter attracting more users on-line.

6. Conclusion

This paper seized the opportunity of the rapid wired and wireless technological advancement and expansion as well as the indisputable need for multi-channel services delivery to investigate and further explore the related opportunities and challenges undersigned with the combination of these two standpoints. Primary objective was to examine whether the new ICT technologies could enable the involved services providers to reengineer their front and back-offices so to adopt a flexible multi-channel open interoperable architecture increasing the services provision sustainability and consequently the citizens' quality of life, not only locally but across the European reality as well. Key questions and arguments converging to the requirement for multi-channel service provision through a single point of access anywhere, anytime and anyhow, re-enforcing this way core functionality issues related to mobility, interoperability, integration, transparency, scalability and security struggled to be enlightened. Furthermore, the prime considerations and constraints (technological and not) with regards to the transition from eGovernment to mGovernment have been comprehensively described. Furthermore, it seems that nowadays two contradictory objectives direct the private and public services providers:

- To improve the methodologies in which they serve the users, incorporating new channels for services delivery;
- To reduce the costs providing their services.

To meet these objectives the involved sectors have to thoroughly analyze the requirements of the users (i.e. be able to access services anywhere, anytime and anyhow, through e-channels and mobile devices, be able to have direct interaction with a service provider when this is needed, the services provided to be of certain quality, findable, usable, and affordable, and delivered efficiently in terms of response time), and balance the efficiency improvement with their organizational requirements (i.e. cost savings can be realized by e-channels that require little or no staff involvement, efficiency can be improved by the redesign of processes, back-office integrations and component re-use, improving at the same time e-Inclusion). All the aforementioned activities, related to e-services and e-services delivery, should be trustworthy and confidential always aligned to the users' perceptions and requirements (IDA, 2004).

As a final vital point, a proper selection and use of the services delivery channels must be encountered. Special emphasis should be placed to the smooth transition or integration of the wireless components to traditional platforms, emerging the incorporation of new more advanced services delivery techniques and mediums such as e-mail, instant messaging, SMS, interactive voice response systems, digital television and so forth. These channels, primarily, must ensure to the citizens directness, accessibility and inclusion, speed, availability, security and privacy, hence intensifying mobile services delivery sustainability while improving their quality of life.

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