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## Services for the Digital Citizen

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### 1. Introduction

Internet makes it possible to provide services in a new way, making it possible to create added value to the user. At the same time organizations may re-organize and streamline their processes. Internet is changing the way we purchase products and services. Through Internet we may gather background information on competing products and services, compare and purchase things without the need to leave home. From the business perspective there are several targets when moving activities to the internet, serving customers on a 24 / 7 -basis and global reach are issues that may prompt the development of e-business applications. One of the key drivers in e-business is that internet makes it possible to increase company's efficiency and effectiveness (Rust & Kannan, 2003).

In private sector information technology, internet-based applications and technologies are used widely in e-business applications. Clearly, public sector needs to move from paper to electronic correspondence, and from this toward a self-service model where citizens can get the answers and make transactions through the internet (Atkinson & Leigh, 2003). The concept of service is inextricably linked to e-business applications and the types of services there are in e-business environment (de Ruyter et al., 2001). Here self-service is typical, users have learned to help themselves in finding information and buying products. This is the case also with citizens that are using electronic services provided by public organizations.

The development of electronic services in public sector organizations has been relatively slow (Hasan & Tibbits, 2000; McIvor et al., 2002). This is interesting, because it seems clear that also public sector would benefit from electronic access to services. It is not surprising that there is pressure and an increasing demand for development of e-services in public sector. It is noteworthy, that those who can access internet are in a different position than people who do not have this opportunity (Cullen, 2001). Equal access to internet and services that are made available through it is an issue all over the globe, and it concerns also citizens in the industrialized world.

In this article we look at the challenges that development of electronic services in public sector organizations face. It is an environment which calls for cooperation of various departments and functions, and interaction between service providers, experts and other stakeholders. The question of interest is what makes providing electronic services in public

sector so different from development of e-business applications in private companies. In public sector the goal is not only to move services to internet, it is also a question of developing one-stop government solutions (Kubicek & Hagen, 2000; Gouscos et al., 2003). Let us look closer at development of electronic services in public sector.

## 2. Value of electronic services

Electronic services are in this context referred to as e-Services, which relates to services that public organizations provide. The term e-Services is further defined as interactive, content-centred services are accessed through the internet (Rust & Kannan, 2002; Rust & Kannan, 2003). Most e-Services are related to information: the internet is a way to access information independently of time and location. However, there is an increasing demand on interactive and transaction-enabled services through the internet (Ancarani, 2005). Clearly, e-Services need to be integrated into processes and systems of the organization that provides them, especially if the services are transaction-related (de Ruyter et al., 2001).

Travel industry is a good example of an industry, which uses information technology extensively. The customer or the traveller has the possibility to make reservations, get to know hotels, car-rental services and more in the travel destination. The internet gives the traveller services which earlier were possible only through the travel agency. This gives the traveller better control on the travelling experience. The result is a change in the infrastructure of travel industry; today customers are increasingly making reservations by themselves. From the service providers perspective it is critical to have visibility in the internet; the service should be listed when the traveller is planning trip and uses search engines like Google in this. The issue here is that traveller needs to do the planning; technology just shows different options (routes, hotels, fares etc.) to choose from. It is likely that in the future this is not enough, more advanced services will be developed which help in travel planning and adjust to changes in schedules, for example (de Ruyter et al., 2001).

With e-business small- and medium sized companies can compete globally. The most significant benefits of e-business are connected to transactions and communication (Dutta & Roy, 2003). Internet lowers transaction-related costs for both buyers and sellers. Companies can change prices on-line when raw-material costs change, for example. At the same time buyers have access to up-to-date prices directly from their terminals - most online shoppers use comparison-shopping engines (Mulpuru, 2007). Internet allows restructuring of processes which results better profitability - these are important issues for all companies, and are motivators for development in the public sector as well. Even though goals, ethics and values are slightly different business-like performance measurement has been evolving in public sector organizations as well (Van Der Wal et al. 2006; Parhizgari & Gilbert, 2004).

## 3. Electronic services in public sector

Let us look at services in public sector. Services can be described by three dimensions; services can be general in opposite to individualized, separate in opposite to coordinated (integrated) and informative in opposite to performative (Goldkuhl & Persson, 2006).

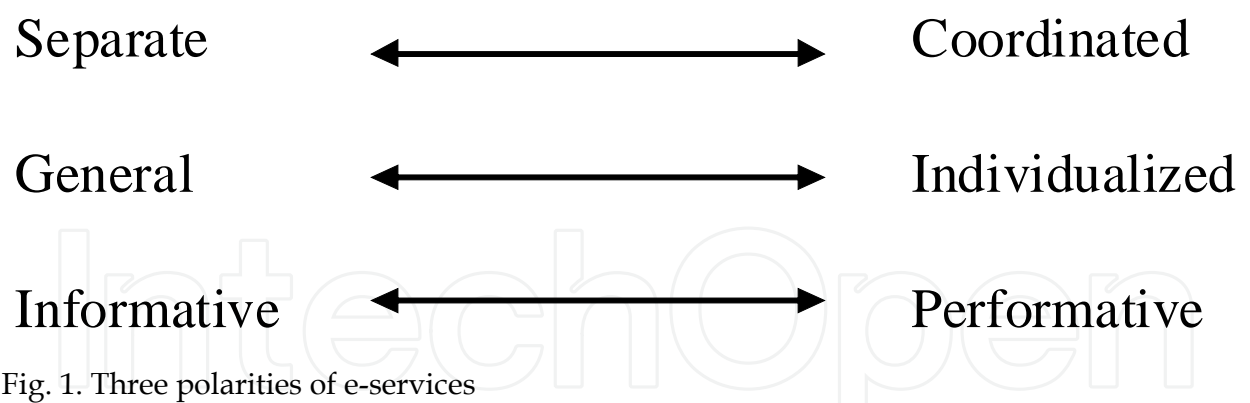


Fig. 1. Three polarities of e-services

The first dimension relates to integration of services. Separate e-services are services from one single agency or office. At the other end there are coordinated e-services which are result of cooperation of several agencies or offices. Some coordinated services are fused together, but there are also services that are merely aligned and may still be separated from each other. Fused services are totally integrated and individual services are not separable. (Atkinson & Leigh, 2003)

The services may be general in a way that they are not designed for any special group of users. Again, services or part of services may be tailored to specific users or user needs. The third dimension of e-service refers to the degree of information and interaction in the service; whether there is interaction and transaction in the services. This dimension is close to seeing development of e-services as a stage model (Atkinson & Leigh, 2003; Asgarkhani, 2005).

In general, the development of electronic services tends to go through different stages, starting with presence on the internet and moving towards transactional services that make it possible to carry out activities right away (Atkinson & Leigh, 2003; Asgarkhani, 2005). The first stage has mostly to do with providing different kind of information to citizens. In the second stage there are often different forms and applications on the website for the user to download and fill. The most enhanced stage is called transactional services. They are result of services that are made transactional. For example, transactional service is when the citizen can fill-in an application for renewing drivers’ license, send it and receive acknowledgement. It might also be possible for the citizen to later track the progress of the drivers’ license renewal, for example.

4. Inter-organizational challenges

Usually development involves cooperation of several people. Especially in development of electronic services like one-stop government services there is a need to combine resources and expertise from different sources. This means that people from various functions, units and locations are brought together, and also outside expertise is needed. Hence, development can be seen as a partnership.

The definition of partnership ranges from working relationships to active transactions and collaboration between organizations. Here the term partnership arrangements include different types of joint ventures, subcontracting, alliances and acquisitions. In this paper the

term partnerships refers to inter-organizational cooperation. In a partnership actors learn to know each other in the long run. Often relationships are relatively intensive and even personal. In business relationships competence and goodwill are needed for trust to develop (Blomqvist, 2002). The important issue here is that partnerships are based on commitment to cooperation between different actors.

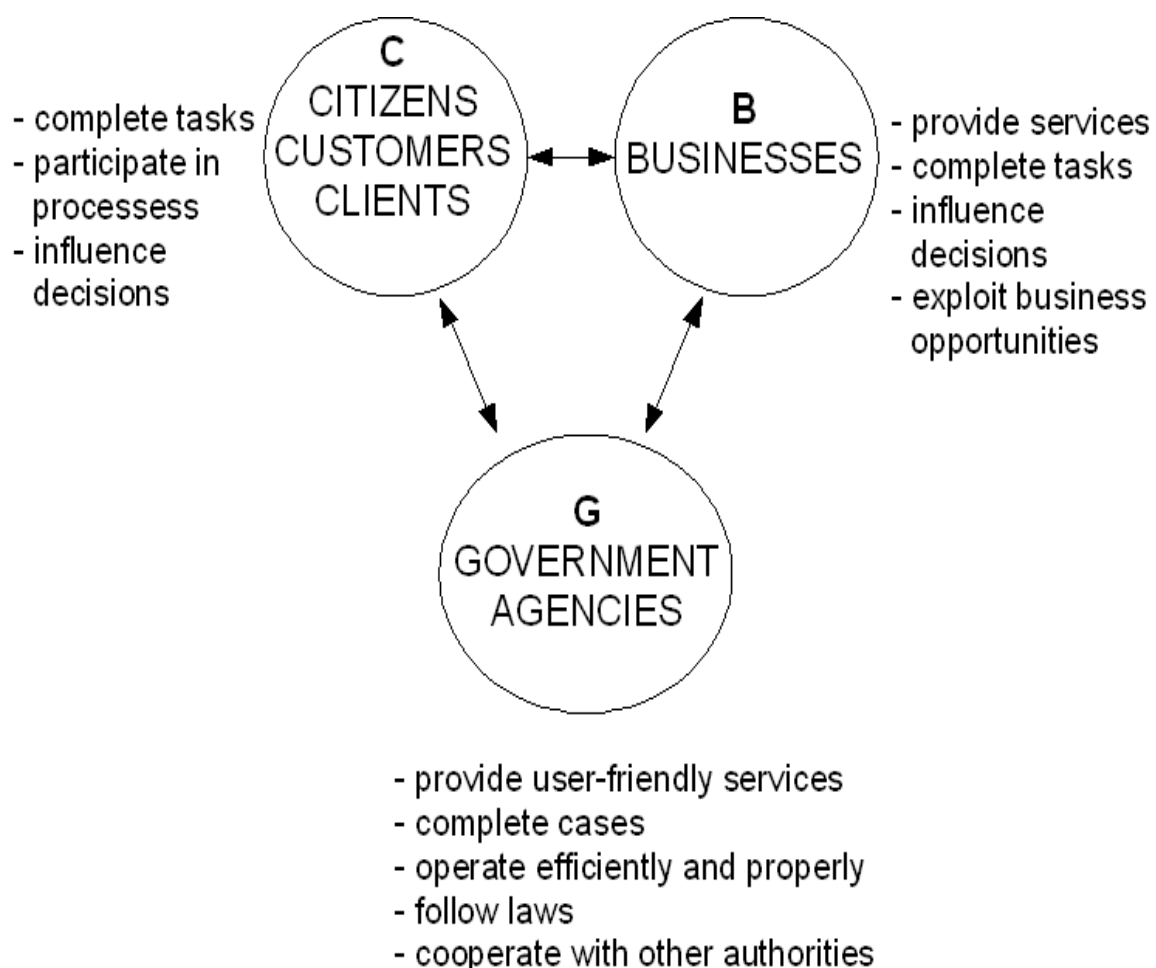


Fig. 2. Actors in public information systems (Sundgren, 2005)

Service providers can be organizations which are “actual” service providers, or they can be outside companies which develop, run or maintain the service in cooperation with the actual service provider. For example, the programming of the application could be done by a specialized software company while the actual service provider concentrates on what is the content of the service. Even though there would be several parties involved in developing and providing the service one should be the service provider who is responsible for the service. This service provider may set rules like minimum requirements or standards.

In development of e-services there are differences among organizations in terms of technical skills, organizational structure and in the attitude towards innovations. This means that not all organizations are ready for changes, and the pace of development differs among organizations (Ancarani, 2005). Thorough planning is therefore needed in development of more sophisticated e-service solutions; this is the case especially in public sector organizations.

<b>Lack of organizational cooperation</b>
<b>Missing legal regulations</b>
<b>Technological incompatibilies</b>
<b>Staff resources and skills inadequate</b>
<b>Funding inadequate</b>
<b>No political support</b>

Fig. 3. Barriers in development of electronic services

Organizational cooperation is one factor that needs to be addressed in development of electronic services (Kubicek & Hagen, 2000). In public sector initiatives where services cross departmental boundaries this is a challenge. In most projects there are often external organizations, IT expertise and special skills that are needed. Cooperation of several partners, units and stakeholders can become a barrier for projects that involve several organizations. Development is often faced with the fact that stakeholders act too independently, because projects tend to be poorly coordinated (Irani, Love & Montazemi, 2007).

The lack of alignment between organizational goals is put forward as a major factor in the set of organizational and managerial challenges. Furthermore, the size of project and the diversity of users and different organizations involved make the development work more demanding. Dawes and Pardo (2002) also address the existence of multiple and partially conflicting goals in public sector projects involving several stakeholders. In inter-organizational projects there is a built-in delay that is result of inadequate organizational cooperation (Kubicek & Hagen, 2000). They (ibid.) identify six areas which cause failures and delays in development of electronic services. The first key area is lack of organizational cooperation. The second key area is missing legal regulations and the third is that necessary pre-conditions in regard to technology are not met. The fourth key area is human factors, skills and resources. The last barriers are result of inadequate funding and political support.

Gil-García and Pardo (2005) found that challenges to various e-government initiatives are cross disciplinary and may be grouped into five categories: (1) information and data, (2) IT, (3) organizational and managerial, (4) legal and regulatory, and (5) institutional and environmental. Information and data (first category) covers the capturing, management, use, dissemination, and sharing of information. In this category the developers also need to address data quality and data accuracy as well as dynamic, changing information needs. Information technology (second category) refers to issues like technological incompatibility and complexity, security, usability, technical skills and experience, and technological newness which all present challenges for development and use of services. Organizational



and managerial issues (third category) are the main challenges to information systems development (Gil-García & Pardo, 2005). It is clear that laws and regulations must be taken into account when developing electronic services (fourth category). The institutional and environmental challenges (last category) are result of the institutional framework in which public organizations. The framework also includes the existing policy environment.

## 5. Focusing on services in public sector

There is an almost infinite potential in development of electronic services in the public sector. Typically, services that are provided through the internet are connected to sharing information. Public sector services are mostly connected to information – and internet is a very efficient way to gather and share it. We argue here that developers of public sector e-services should do more than they have done so far.

In public sector there are numerous electronic, information technology powered services already today. The citizen may use an arbitrary computer connected to the internet and apply for children's day-care, or inform the authorities that the address has changed, for example. These can be done by filling in a form on-line, or downloading it and printing for manual processing. Other typical e-services include seeking information from service providers' internet-pages or requesting further information and advice. It is still clear that many public services are in their early stages; often they are based on existing ways of doing things instead of thinking what citizens need (Howard, 2001). Services need to be integrated which calls for a total re-planning of services in order to better meet the needs of the citizens (Atkinson & Leigh, 2003).

The developers of e-Services need to better understand users of public services. Clearly, the citizens should not have to surf the internet and try to find different services that are spread all over. Better integrated, portal-type sites would make it possible to find relevant information effortlessly. This involves integration of services that are generated in separate offices, departments and units (Atkinson & Leigh, 2003). For example, too often agencies provide information only from their "own" services and activities. Instead, information should be widely available so that users would not have to guess or know what other related information and services there are so that users could better have their problems solved. Services should also include information, advice and links that are not provided by the agency itself. There is a need *"...to approach the Web with a philosophy of helping users solve problems, not merely delivering their same old services through new medium"* (Atkinson & Leigh, 2003).

It is often noticed that people send lot of email to public administration. This is because it is easier to ask than try to figure out what agency to contact and how to proceed. Public administration is full of administrative jargon and official pseudonyms – which are likely to be transferred to web when they have been digitized. The whole structure of the web-sites is based on different agencies, departments and units (stovepipe-structure) rather than integrated portals (Atkinson & Leigh, 2003). In addition, the sites are often relatively unfriendly and there are no comprehensive search-engines that would make it easier to find information from the site, for example. In this way poorly designed internet site can easily increase the burden of the staff in public sector organizations when the amount of incoming email queries go up. This should indicate that existing service through the internet needs to be developed. The solution to the problem is that the services should be more straightforward, easier to understand and include self-service -type of elements.

One suggested method for increasing the amount of self-service over the internet is giving rebates for those using e-services. In e-business it is common that customers who make the reservations over the internet, for example, receive a rebate or discount coupons that they can use when shopping again in the future. The goal is to develop lock-in, and push the customers to using services that are available on the internet. The customers can do e-shopping whenever it best suites them, they don't need to wait on phone, for example. At the same time self-service frees staff from answering customer calls to more productive work. The question here is that why could not public sector organizations use similar techniques in order to promote e-services and "locking" citizens.

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-to-use, robust and trustworthy services are needed so that more users start using e-services in public sector.

## 6. Adoption of e-services

The successfulness of any service depends on whether users start using it or not. This is widely referred to as adoption. Previous research has found several factors that affect the formulation of attitudes and behavior to innovations and leads to their adoption (Rogers, 2003). Relative advantage, compatibility, complexity, triability, communicability and perceived risk are attributes that are important here, they outperform even other types of adoption predictors like situational variables and user characteristics. Rogers (2003) argues that innovation attributes have explained 49 to 87 per cent of the variance in the rate of adoption of various innovations. In predicting adoption the focus has been in adoption of products the factors may be applied to adoption of services which are delivered electronically (de Ruyter et al. 2001). From the array of attributes are perceived risk and relative advantage most relevant in explaining adoption of e-services.

The perceived risk is particularly applicable and important to services as the perceived risk tends to be considerably higher than in case of products. In internet the risk is high because the customers do not know whether the service providing e-business is "big or small, new or established, legitimate or illegitimate" (Hagel & Singer, 1999). It is still noteworthy that organizational reputation has a strong influence on trust, attitude and behavior (de Ruyter et al. 2001). In internet trust plays a critical role because - depending on the service - users have to release personal or financial data to the e-service provider. This takes in an environment where the user may have very little information on the service, the e-service provider and their trustworthiness.

While using internet for users will look for innovations that provide an advantage over current services and products. It becomes operationalized in functionalities and properties as "time-saving", "range of options" and "ease of use" (de Ruyter et al., 2001). Also convenience is an important issue. For example, there is no need to go to a certain office at a given time, when there is an e-service for doing the task it can be accomplished whenever and wherever using a computer that can connect to the service through the internet. When the innovation provides relative advantage to the user it is seen as a trigger to use of the



innovation in question. In e-business relative advantage means that companies should offer better and preferably unique services to the customer if they want to distinguish themselves from other businesses (Tambini, 1999). The e-service must offer benefits over existing services and ways of doing things for attracting potential users and gaining “critical mass” behind the service.

Relative advantage plays a role in formation of attitudes and behavior towards e-services. Also organizational reputation has an important influence on users. It has a strong positive impact on the customers trust in, quality perception of, and intention to use the e-service (de Ruyter et al., 2001). As a result, the reputation of the services becomes an impediment for successful e-services.

## 7. Discussion

We have looked at development of electronic services and the challenges that this involves. The focus has been on services in the public sector, and they have been mapped against commercial e-business services. In this context interplay of several units, functions and organizations is needed – especially if the provided services are sophisticated, and providing users one-stop government e-services.

Development of electronic services - or information technology in general - requires connecting technologies and applications in order to provide solutions for users. There is a variety of underlying information infrastructures, applications and services that may be owned, maintained or developed by organizations from private or public sector (Ancarani, 2005; Sundgren, 2005). Similarly, development of e-Services is a combination of expertise and effort from people in the organization and from external environment.

The types of electronic services vary greatly in public sector. It is natural to expect that services are integrated into processes and information systems of the organization that provides them. However, in public sector organizations it is common that departments and units provide services to citizens rather independently. Departments have different processes and information systems which are not connected. In many cases information is stored in separate databases. This may be enough when services are oriented to information delivery between the public administration and the citizens. For example, providing downloadable documents and forms is simply offering documents in electronic format and making them accessible through the internet.

Over time more services are developed, more features are added to existing services, and more enhanced, transactional services are developed (de Ruyter et al., 2001; Atkinson & Leigh, 2003; Asgarkhani, 2005). This is challenging as when services become more sophisticated the overall complexity increases. It has been noted that moving to services that are transactional is a big step (Howard, 2001). Transactional services require connectivity, information in other systems and data-bases needs to be accessed, combined and updated from users’ interface through the web. This is challenging from the information systems viewpoint as the situation calls for connecting originally separate systems which may be based on different software and database structures.

Cooperation is a challenge for management of the development of electronic services. It is not uncommon that managers find themselves making decisions about technology for

which they are unprepared or even ill-equipped (Gil-García & Pardo, 2005). Successful development calls also for top management commitment, linkage to business, technical alignment, knowledgeable personnel and involvement of users (Pardo & Ho, 2004).

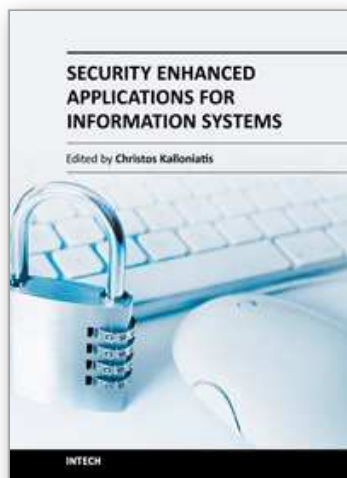
It is very important to look at services from user's perspective – whether they are connected to e-business or public services. As long as there are citizens that do not use electronic services organizations must to provide same service electronically and as a traditional service – the result is increased costs instead of cost savings. If the service is based on existing departments, administrative procedures and processes it may not be able to provide added value to the user. There is a need to do things differently, cross boundaries and redesign processes when designing e-Services. Hence, the work of developing and rebuilding government for the digital age is just beginning (Atkinson & Leigh, 2003).

The success of electronic services depends on whether users – digital citizens – find them valuable and start using them. In e-business solutions it has been found that sites need to be both easy to use and add value to the user, these are key attributes that increase the use of services (Igbaria et al. 1995; Lee & Turban, 2001; Lim et al. 2008). The added value lies in properties as “time-saving”, “range of options” and “ease of use” (de Ruyter et al., 2001). The web sites should also provide enjoyable experiences, these kind of sites will probably be visited also in the future (Shang et al., 2005).

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## **Security Enhanced Applications for Information Systems**

Edited by Dr. Christos Kalloniatis

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Every day, more users access services and electronically transmit information which is usually disseminated over insecure networks and processed by websites and databases, which lack proper security protection mechanisms and tools. This may have an impact on both the users' trust as well as the reputation of the system's stakeholders. Designing and implementing security enhanced systems is of vital importance. Therefore, this book aims to present a number of innovative security enhanced applications. It is titled "Security Enhanced Applications for Information Systems" and includes 11 chapters. This book is a quality guide for teaching purposes as well as for young researchers since it presents leading innovative contributions on security enhanced applications on various Information Systems. It involves cases based on the standalone, network and Cloud environments.

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