Abstract

One-stop government is an important development within the current initiatives of e-government. It refers to a single point of access to electronic services and information offered by different public authorities. Online one-stop government requires all public authorities to be interconnected and that the customer (citizen, private enterprise or other public administration) is able to access public services by a single point even if these services are provided by different public authorities or private service providers. It further requires that the customer be able to access these services in a well-structured and understandable manner meeting his/her perspectives and needs. Developing a national one-stop government portal calls for an integrated service modelling that requires a holistic reference framework.

This paper discusses the general requirements for one-stop government. It then introduces the requirements for providing electronic public services in a one-stop platform. This is followed by an investigation into integrated modelling of online public services. Since modelling electronic public services requires the know-how of different disciplines and expertise, a holistic reference framework is introduced. The paper concludes with an example of the life event ‘marriage’ to demonstrate the need for, and value-added of, integrated service modelling.

Author

Maria A. Wimmer (mw@ifs.uni-linz.ac.at) is research and teaching assistant at the Institute of Applied Computer Sciences at the University of Linz, Austria. Her research focuses on electronic government and on Knowledge Management in the public sector. Currently, she is involved in a European project (eGOV, IST-2000-28471) on the development of an integrated one-stop government portal. Her responsibility within the project lays on the service modelling of online public services. Further, she is organizing the annual workshops on knowledge management in e-government.

Integrated Service Modelling for Online One-stop Government

ONE-STOP GOVERNMENT

For several years, electronic government (e-government) has been high on the agenda of modernizing public administrations. Many studies and best-practice projects have emerged and national governments, as well as the European Commission, have launched huge funding to further innovative developments in the field. E-government is a multidisciplinary field with many facets to investigate. In this paper, focus is put on one-stop government and an integrated service modelling needed to provide electronic public services through such a one-stop concept.

One-stop government refers to the integration of public services to a single point of access from a customer of public administration’s point of view. ‘Customer of public administration’ refers to a citizen, businesses or other public administrations that may apply for a public service. Realizing the single window concept brings an important organizational shift: from public services structured around the fragmentation of public administration towards a customer-oriented structure of public services. This shift implies that on the one hand, at the one-stop portal, the services are provided according to the customers’ context and situations (e.g. life episodes, business concerns, business situations and specific topics). The customers must be able to access these services in a well-structured and clear manner meeting the customers’ perspective and needs. This view must be uncoupled from the different public authorities or private service providers that actually deliver the public service. On the other hand, the specific responsibilities and fragmentation of public administration in respect to service production and service delivery must not be hampered. Hence, a smooth integration of two distinct views is required: an external, customer-oriented view; and an internal, public administration oriented view.

To sum up these key issues, one-stop government reflects a single-window access structure of public administration as demonstrated in Figure 1.

In online one-stop government, access to public services is realized through a governmental portal. National portals have been developed, or are under development, in an increasing number of countries (Eymeri 2000, Suter 2000) such as Austria (www.hlp.gv.at), France (www.service-public.fr), Switzerland (www.ch.ch) and UK (www.ukonline.co.uk).

The importance of online one-stop government in public service delivery was pointed out recently in a European Commission study (eEurope 2001b). This study was conducted to evaluate the maturity within the Member States of the 20 electronic public services
that had been identified as the most important by the eEurope initiative (eEurope 2001a). The evaluation study concluded that ‘the online development of public services can be enhanced by co-ordinated e-government solutions which allow local service providers to take advantage of centralized online initiatives offering a single point of contact in the form of e-portals or ASP-related solutions (Application Service Providers), with a citizen/ customer-oriented approach rather than a procedural approach.’

However, in spite of the work conducted so far, online one-stop government is still in its infancy. The main characteristics of online one-stop government are also some of its main barriers. From a technical perspective, providing integrated services can only be realized if all public authorities are interconnected and their systems are interoperable.

Further, e-government stresses an active participation of the citizens and customers in government and democracy. Thereby, modern telecommunication infrastructures (IT) provide the basic means for cooperation over periods of time and distance between citizens, businesses and public administrations. It is important that customers or citizens may decide up to which level they want to use electronic media to perform a specific public service, in other words, whether they only want to gain information concerning a certain service, want to get in contact with the respective authority, or even want to apply for and utilize the service via electronic media.

**REQUIREMENTS FOR PROVIDING ELECTRONIC PUBLIC SERVICES IN A ONE-STOP PLATFORM**

The services offered in a one-stop shop should be easily understandable for any citizen or business partner. Such an approach (i.e. life-events and business situations) has been developed by the Austrian initiative towards a national e-government portal (www.help.gv.at, see Winter 2000) and has become a metaphor for structuring citizen and business information as well as administrative processes in a user-friendly way. Structuring according to life-events represents one core design issue. Any life-event or business situation may further be structured into four principal stages where the customer/citizen should decide upon how far to use electronic media. These stages correspond (Lenk 2001 based on the Business Media Reference Model for electronic markets of Schmid 1999) to:

1. simple what-is, what-is-required and where-to-go information on the service;
2. possibility to contact people and to get further information (communication);
3. downloading and handing in forms for applications of public services (interaction or contracting);
4. handling a complete service (transaction).

Implementing a full virtual administration with the concept of one-stop government recalls several further core requirements to be fulfilled. Among them:

- a smooth adaptation of traditional processes to modern technology;
- the possibility to access public services via a single entry point even if these services are actually provided by different departments or authorities;
- the necessary level of security, authenticity and privacy in communication and transactions via the Internet especially for highly sensitive and personal data and information;
- the adaptation of internal (workflow, databases, intranets
etc.) and external (information and communication services to the citizens and business customers, transactions of goods and services via the Internet) change requests for public activity, i.e. a smooth coordination of internal and external public activity facilitating cross-border operation;

- customer preinformation, help in filling in forms etc. provided at various stages and in various depths;
- the demand for a service (a licence, etc.) translated from the citizen’s/businesses world to legal-administrative jargon and vice versa.

A further significant requirement of one-stop government is accessibility through multiple delivery means (or channels), including physical presence at designated citizen offices, call centres, Internet, mobile devices, satellite TV, etc. Online one-stop government allows citizens and businesses to have 24-hour access to public services from their homes, companies, libraries, schools, shopping malls or even on the move.

Fulfilling all these requirements will come close to the realization of an integrated online one-stop government concept. As one can recognize, integration has to fulfil several objectives:

- integrating public services that are offered by distinct authorities to one single access point (customer-driven integration);
- interconnecting all public authorities with the one-stop system to allow a smooth coordination of service performance by different authorities (task- and expertise-driven integration); and
- integrating functionality, data and resources that are used by different authorities to perform the service request (resource- or data-driven integration).

Studying current developments and initiatives towards e-government makes one realize that we are still far away from such next-generation virtual administrations, obtainable with only a few mouse-clicks. This may be due to many aspects that still need clarification (Wimmer et al. 2001). These aspects include: setting up the appropriate legal grounding; adjusting the access rights and mode of access to highly sensitive data (which is not just a matter of security, but also of public–private and public–public partnerships, of the current laws, of the heterogeneity of systems and data formats, etc.), and resolving red tape problems.

One other obstacle is the semantic standardization required to present public services through a single window concept. An important issue in this respect is the need for a common and clear concept of navigation to be implemented through the one-stop government platform. This should fulfil the needs of the potential users of the platform. The following section presents a general concept to structure public services around the needs of the different user groups.

**STRUCTURING ONLINE PUBLIC SERVICES**

As already mentioned, life events and business situations are an upcoming metaphor for structuring and defining specific online public services from a customer’s point of view. However, in current work, semantic differences in the use of the terms processes, public services and life events can be encountered (e.g. in the eGOV project, IST-2000-28471, www.egovproject.org). Hence, a typology to clearly distinguish the different terms is a prerequisite for developing online public services. The left side of Figure 2 demonstrates the overall relationship of the various...
expressions. The entry point of a user of online public services may be:

1. **Life events** describe situations where people may require public services. They may be structured according to specific aspects regarding different citizen groups (e.g. birth, school, marriage, residence and personal documents).
2. **Business situations** describe topics where companies and self-employed citizens interact with public services or public authorities (taxes and customs, building permissions, employment of workers, etc.).

Life events and business situations indicate the overall semantic content (i.e. information or public services) to facilitate a customer’s navigation, orientation and search through the complete offers provided by public authorities on the one-stop government portal. However, the customer does not consume a life event or business situation since this general structuring concept only represents the overall entry point to specific public services at the portal level.

The concrete products and services a customer applies for or needs to perform with public authorities are **public services**. They are the core concept to be handled by the portal and front-office part of an integrated one-stop government system.

Public services reflect the external (customer oriented) point of view, whereas a **process** refers to the public administration’s internal viewpoint, which also reflects the public administration’s organizational fragmentation, responsibility and domain expertise.

A process normally consists of several **process steps** that describe single tasks within a process. Process steps reflect the fine-grained decomposition of a process. In regards to online public services, some process steps may be located at the front office. They may also be called **basic services** such as the identification of a user, the digital signature for an application of a public service, the payment for a public service, etc.

Within an integrated platform for one-stop government, public services and information touch different internal organizational units of an organization on the one hand, and distinct life events or business situations on the other hand. These internal vs. external viewpoints have to be integrated and mapped in a coherent way without:

1. disturbing organizational matters, responsibilities and expertise of public administrations; or
2. requiring that external citizens or business clients have knowledge of the public authorities’ internal organization.

The different concepts for describing public services required in one-stop government call for an appropriate mapping of the technical and organizational units of a one-stop government system as demonstrated at the right side of Figure 2. Meeting the many requirements for one-stop government calls for a holistic approach which is introduced in the next section.

**A HOLISTIC REFERENCE FRAMEWORK FOR SERVICE MODELLING**

A good understanding of public services is crucial for adapting them to one-stop government. Proper comprehension is no small problem, as in the field of operational administrative action, a huge variety of different processes can be encountered (Lenk and Traunmüller 1999). Most processes are rather complex due to several causes (cf. Lenk et al. 2002): the extraordinarily complex goal structure of public administration; the high degree of legal structuring of administrative work (allowing a high degree of transparency and accountability, yet probably hindering plain and common ways of re-engineering); the amount of work that only can be performed in cooperation with other agencies is rather high (administrations are working via a complex tissue of cooperation of acting entities); etc.

As a result, the mode of administrative processes and decision taking becomes very particular. Thus, administrative work appears as complex and rather strange. Here, an appropriate reference framework is required that facilitates the understanding of the complex structure and network of public services and governmental units.

The holistic reference framework as shown in Figure 3 is based on the socio-technical approach (cf. Cherno 1976), the Business Media Reference Model (BMMR) of Schmid (1999), the Information Architecture of Mok (1996), an elaboration of the BMMR by Gisler (1999) who extended the Schmid model with legal aspects and a discussion of Lenk (2001) who elaborated the BMMR from the point of view of different stages in service delivery. What can be learned from these approaches is the multidimensional consideration (from the strategic layer to the technical layer) of distinct aspects (organizational, judicial, security, process modelling, access, services, workflow, etc.) and the core phases of an electronic public service (from information to transaction and settlement – including an aftercare phase). The strengths of these approaches have been merged to a holistic reference framework. This concept supports the understanding of complex public services from three distinct points of view:

1. Abstraction layers: different points of detail;
2. Progress of public services: different phases of progress of a public service; and
3. Different views: distinct foci on issues.

**The Abstraction Layers**

A complex socio-technical system such as one-stop government can only be managed and developed through
different abstraction layers. The holistic approach integrates the following perspectives:

1. **Strategic framework**: This layer represents the view on the basic organizational requirements (the strategy, basic roles, the strategic decisions and constraints) for realizing a one-stop government system. Concepts to support developments in this area are among others New Public Management (Hunziker 1999; Schedler and Proeller 2000), Human Relations Management and Business Process Reengineering (Hammer and Champy 1993).

2. **Public services, processes and workflow**: On this layer, the general business strategies and basic roles are substantiated. This means that public services (customer’s view), processes (public authority’s view) and their workflow are specified. Thereby, the roles and their collaboration, the steps of the process, the co-ordination of input, throughput and output and the adaptation of the public service to the legal framework are defined and settled.

3. **Interaction**: On this layer, the interest lays on the concrete service performance, i.e. the integration of the service models, processes, the people and information technology involved and the data and information objects belonging to the public service. So, interaction and information flows are investigated. Further, the interfaces between different concepts (people, data and information, processes, public service, legal grounding, etc.) are an object of study.

4. **Information technology**: This layer is concerned with the technical implementation of the IT components of the one-stop government system such as the portal, the repositories providing the online one-stop public services, a standardized data and information exchange format. It also contains the communication, transaction and transportation infrastructure respectively with their interfaces.

**The Evolution of a Public Service**

For quite some time, several (not necessarily contradicting) discussions on how to approach different stages in electronic service provision have existed (e.g. the BMRM (Schmid 1999), the OL2000 (2001), Lenk’s discussion (Lenk 2001) and the EC also addresses four different stages in the list of prioritized public services to be implemented at first hand (eEurope 2001a)). The approaches can be generally divided into concepts that focus on aspects of development, i.e. simple information portals, providing communication facilities and, finally, fully online transactions. The concepts refer to the maturity of electronic services (e.g. the EC list). The other group of approaches addresses different degrees or stages of electronic service consumption, i.e. from simple information provision via download of forms to interaction and finally transaction services (the most difficult part but final objective for provision of online services). In these concepts, an electronic service is divided into different stages of progress (e.g. the BMRM). Some other discussions further elaborated the stages of progress of a public service and added an aftercare phase (OL2000 and Lenk), i.e. full support for electronic public service delivery does not end with the service delivery and payment, but also facilitates customer relationship management, complaints management, etc.

The holistic reference framework enables an electronic public service to be approached in four phases:

1. In the **information and intention building phase**, the users search for information regarding possible intended public services. They can read information about the service itself, how to apply for it, whom to contact to get more detailed information and what the preconditions are. Further, information is provided on the different possible ways to make a transaction (e.g. online; downloading a form and sending the form via ordinary mail; or appearing personally at the service counter) and
about which documents have to be provided. Despite the one-way information consumption, the customer can get in contact with an authority in order to acquire further information regarding the procedure to apply for a specific public service, etc.

2. In the contracting phase, the user already knows what s/he needs to do. S/he either fills in the online application form or downloads the corresponding form from the server and fills it in. Sometimes, contract negotiations may take place in order to set up the obligations of each partner (service level agreements). These agreements are signed in a contract and are obligatory for both sides. However, most times the citizen or business partner directly hands in the application for a public service, which is to be considered as the contract. This can be done by means of an online transaction, in written form electronically or via ordinary mail or personally at the administration counter. If an electronic medium is used, attention has to be paid to authentication and authenticity. With this action, the customer activates an administrative process, where, at first hand, the public authority verifies the completeness and correctness of the application. In case some material or data is missing or incorrect, the applicant will be asked to refine the data or to provide the requested material. In case of acceptance, the application is passed from the front-office to the back-office for further handling (see next phase).

3. In the service delivery and payment phase, the processes to complete the service are performed, the results are conveyed to the customer and the customer pays for the service. Possible results can be e.g. adjudicating a social benefit, issuing a document, transferring information, etc. This phase is the most complex and complicated one in the four stages. Different types of processes from simple and well-structured routine processes to weakly structured processes of decision making and negotiation have to be implemented (Lenk and Traummüller 1999; Lenk et al. 2002; Wimmer et al. 2001).

4. The last phase of the holistic reference framework addresses an aftercare phase, where aspects of citizen (or customer of public administration) relationship management and complaints management are addressed. Furthermore, aspects of filing and information delivery for statistical purposes within the net of public authorities have to be supported. Often, a public service is not a matter of a single consumption, but of repeated contact and of e.g. monthly delivery of service (e.g. social subsistence benefits, grants for studies, etc.). Aspects of this concern are to be taken care of in this phase, too.

Customers do not need to run through all the above-mentioned phases. On the one hand, depending on their situation, they might only want to gather information about a public service (only information phase), alternatively, they might already know the procedure for applying for a service and, hence, start with filling in an online form (starting with the contracting phase). On the other hand, the aftercare phase is not always applicable or may not be performed by an authority. The two basic criteria for navigating through these four stages of progress of an online public service are: 1) the level of know-how the customer already has about a specific public service; and 2) the characteristics of the service under consideration.

Different Viewpoints

In order to decide the requirements and developments for an integrated platform for online one-stop government, a distinction of different views is required. Apart from the principal focus on the services of public administration, the reference framework supports the following foci:

- service perspective (focus on public services, the processes and functionality required, service flow, workflow, etc.);
- technical viewpoint (focusing on the technical implementation of the system);
- view on people (deliberating the needs and requirements for the different user groups: citizens, businesses, public administration employees);
- security aspects (deliberating the security requests for public services and for the one-stop government system);
- legal issues (investigating legal constraints, frames etc.);
- organizational aspects (structural fragmentation of public administration and division of domain expertise, responsibilities, etc.);
- social and political aspects (considering political decisions, social impacts, etc.); and
- view on data and information (designing information objects, databases etc.).

With this distinction of different perspectives, a careful deliberation of the various aspects shaping and impacting one-stop government systems should be guaranteed. In the following section, the holistic reference framework for integrated service modelling is demonstrated with an example of marriage.

EXEMPLARYING INTEGRATED SERVICE MODELLING

An example of integrated service modelling as shown in Figure 4 should underline the added value of the holistic reference framework introduced beforehand. The case is based on the life episode of marriage in Austria. For the sake of brevity, exceptions are not demonstrated here. The figure is divided into portal/front-office and back-office with distinct grey shades reflecting as well the
external vs. internal view as discussed before. The modelling concepts life events, public services and processes/process steps are used to describe the public service of marrying at the civil office in an integrated way. Citizens access the national one-stop government portal and search for marriage or marrying. If they are already acquainted with the concept, they can also directly search for the respective public service (i.e. ‘marrying at the civil office’). The citizen can choose to get general information on the public service ‘marrying at the civil office’ or start to prepare to collect the required documents (if already aware which documents are needed). After obtaining all the required documents, the citizen fills in an online form to apply for ‘marriage at the civil office’ and adds the necessary documents. In Austria, both bride and groom have to apply for the marriage at the civil office (i.e. one online form is filled in and all the documents of both are added).

The one-stop government portal sends the application to the responsible authority (i.e. the portal derives the authority in charge from the data the citizen has provided and the official responsibility of an authority for a public service). At the respective back-office, the official in charge verifies the application and confirms the suggested date for the civil marriage through the portal. After the date has been fixed, the fee is calculated and the citizen pays it online through the basic service provided at the portal.

After the marriage ceremony, the citizens get the certificate of marriage (issued by the back-office), the public servant enters the change of the status of family of the two married in the central persons record of the authority and the public service of civil marriage terminates. However, as the figure indicates, some further public services may be invoked depending on the contextual situation. For example, if one of the two changed his/her name and if s/he moved his/her place of residence, then further public services are triggered. This context- and event-based relationship is indicated with the dotted arrows going from the back-office to other public services. As an example, if the bride changed her family name, this requires an update of some personal documents such as the driving licence.

If the two just married also move to a common household, the public service ‘changing place of residence’ is invoked, which belongs to the life event ‘moving home’.

Representing situational and context-sensitive bundling of public services is an important aspect for successful and customer-oriented provision of public services. Here, web semantics and standardization issues take on the utmost importance. Topic maps (http://www.topicmaps.org) seem to be a promising approach to support this concept of integrated service modelling. The holistic reference model presented here reflects a first step towards integrated service modelling. However, further research is required on the development and implementation of one-stop government and integrated service modelling.
References