

IST PROJECT 2000-28471



An Integrated Platform for Realising Online One-Stop Government (eGOV)

Project Number:	IST-2000-28471
Project Title:	An Integrated Platform for Realising Online One-Stop Government
Deliverable Type:	PU

Deliverable Number:	D111
Contractual Date of Delivery:	30 November 2001
Actual Date of Delivery:	10 January 2002
Title of Deliverable:	Platform and Network Architecture Functional Specifications
WP contributing to the Deliverable:	WP11
Nature of the Deliverable:	PU
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Abstract: This Deliverable presents the technical perspective of the eGOV project. It includes an overview of the platform and technical architecture and an analysis of the user requirements. It provides the basis for further specifying and implementing the eGOV platform.

Keyword List: eGOV, e-Government, portal, GovML, one-stop Government, public services.

Project funded by the European Community under the "IST" Programme (1998-2002)

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Executive Summary

The aim of this deliverable is to present the technical perspective of the eGOV project. In that respect, this deliverable includes:

- ❑ An overview of the eGOV portal platform and the network architecture along with an introduction of all relevant components e.g. portal, service creation environment, service repositories etc.
- ❑ An analysis of results of small-scale surveys conducted in three countries (Austria, Greece and Switzerland) in order to determine the end-users requirements concerning platform's technical features. The surveyed end-users included citizens, businesses and public administrations at different levels. The surveys were conducted using questionnaires that were constructed for that purpose.
- ❑ A detailed description of all technical components within the eGOV system.
- ❑ The specifications of the various components of the technical architectures including portal and network architecture. The Unified Modelling Language (UML) is utilised as the adopted graphical formalism in order to derive the technical specifications of the eGOV platform. More specifically, the usability of the platform (portal and network architecture) is presented by means of use case and sequence diagrams.

This deliverable provides the implementation partners of the eGOV consortium with the basis for further specifying and implementing the eGOV platform.

This deliverable is complemented by its counterpart D121 "Services and Process Models Functional Specifications", which provides the non-technical perspective of the eGOV project. It should be noted that D121 provides the working framework of the project, which also dictates its exact scope. For example, this deliverable introduces and examines the **eGOV services**; while D121 investigates the role of **public services** within the eGOV project. Therefore, it might be beneficial for the reader to commence with D121 before proceeding with D111 in order to gain an overall understanding of the scope of the project before proceeding with the proposed technical solutions.

The work reported in this Deliverable was conducted within WP11 "Specification of Platform and Network Architecture". It should be noted that WP11 also aimed to survey related state-of-the-art technologies, protocols and methods. The results of this survey are reported in D011 "Project Presentation and State of the Art".

1 Introduction

The goal of this project is to build a new framework that enables government and other public authorities to offer content and services to citizens by building a demonstration environment for presenting these ideas to the public. The implementation of this framework in the eGOV project will be based on situations of human beings (life-events) and topics of companies (Business situations) that trigger public services. In this respect, citizens and businesses will not be obliged to be aware of the fragmentation of public sector. Another goal is to technically promote the web sites of public authorities so that they can reach the same level as sites operated by private organisations. A demonstration environment does, however, differ from a production environment and, therefore, it does not fulfil all criteria of a full-scale environment. A demonstration environment rather enables development by providing a new solution or a concept that can be further developed and exploited according to individual needs.

The main idea is that the eGOV platform will be able to introduce, manage and trigger the execution of life-events/business situations. For this reason, a portal will be installed at a central point, while the appropriate network architecture will be installed for each Public Authority so that they can handle the life-events/business situations in terms of public services.

The deliverable is organised as follows. Section 2 defines the main vocabulary of the eGOV system. Section 3 analyses the results of the performed surveys concerning system specifications. Section 4 presents the overall system architecture. The main eGOV-specific subsystems and orientations are described. These include the Portal, Service Creation Environment, Service Runtime Environment, GovML, network infrastructure, etc. In Section 5 general issues regarding portals are presented, while Section 6 examines in detail the main portal subsystems and interfaces within the eGOV platform. Portal functionality is further specified through UML diagrams in Appendix A. Finally; in Section 7 the network architecture (Service Creation Environment, Service Runtime Environment, Service Repository) is specified together with the appropriate use case/sequence diagrams.

2 Definition of eGOV Platform and Network Architecture

The “eGOV platform” comprises the whole infrastructure of the end solution. The platform can be divided to two areas: the portal and the Network architecture. The network architecture describes the service creation environment, the service repository and the service runtime-environment. The Network architecture will rely on both the XML syntax GovML that will be developed during the project and existing standards and frameworks.

The portal is a central access point to the content and services. The network architecture is identical regardless of the public authority organisation that will use it: the local and national service creation environments (SCE), service runtime environment (SRE) and service repository (SR) contain the same technical components, but of course the actual production environments are separate, i.e. there can be many SCEs, SREs and SRs.

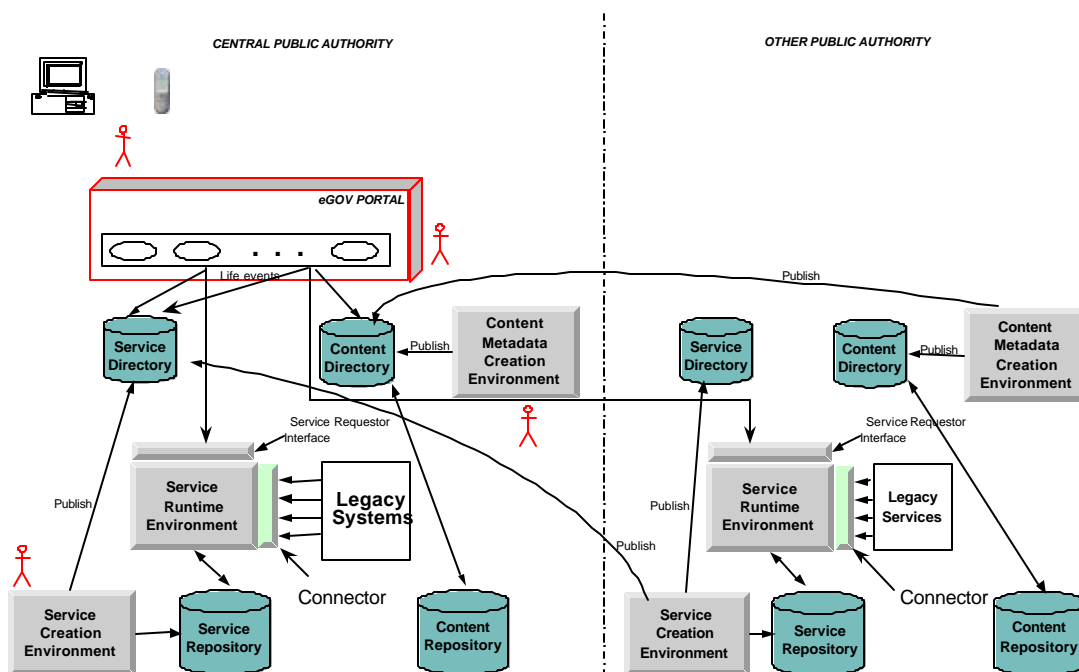


Figure 1 Overall architecture of eGOV

2.1 Vocabulary

Life events describe situations involving human beings that trigger public services.

Business situations describe topics involving companies and self-employed citizens that trigger public services or interactions with public authorities.

Public services are the legal subjects of public organisations in a user-oriented sense. Each public service is the result (development and delivery of products and services) of an organised unit in favour of public interest

Elementary Public Services are public services that are invoked by users, produced by a single public organisation and delivered to the users, e.g. the issue of a birth certificate.

Composite Public Services are sets of elementary public services that together address a specific need of users (or user groups). This term is introduced in order to correlate the life-event orientation with the execution environment.

Example: a composite service named “Issue civil marriage licence” consists of elementary services such as:

- Issue of a birth certificate (takes place at a register office of a municipality)
- Acquisition of a fee document (takes place at a tax related PA.)

eGOV services - S/W components that receive information from users and trigger the execution of appropriate processes in order to produce the required outcome. If the outcome is in electronic format, it may be delivered through the eGOV platform to the service requestor.

Elementary eGOV Service – An eGOV service that supports an **elementary public service**. It is entirely performed within a single PA and it does not require other eGOV services for execution.

Composite eGOV Service – An eGOV service that supports a **composite service**. It is composed of several elementary eGOV services according to a specific flow and may be performed in a distributed manner.

Content – The static or dynamic information that authorities provide to citizens through the portal. The content can be closely related to the service or it can be information of news/instruction type.

Service metadata – Information about services, such as the name of the service provider, the name of the service, the interface description of the service.

Content metadata – Information about content like title, summary, keywords, categorisation, etc.

Portal – A place where information (content and services) is being collected and shown to the citizen. The portal offers an interface to the information and possibilities to personalise the services.

Service Runtime Environment - responsible for processing service requests, triggering the execution of elementary and composite services in the context of the SRE, and finally returning a service response.

Service Repository - stores all information required for describing and executing services.

Service Creation Environment - provides means for building, deploying, and managing services.

Content Management – Tools and repositories for content creation.

GovML – an XML vocabulary that supports the delivery of content and services to citizens (businesses) in terms of life-events (business episodes).

3 User requirements

The user requirements were extracted from surveys conducted in Austria, Switzerland, and Greece. The surveys were targeted to three different groups – citizens, businesses, and public authorities. Both on-line and traditional questionnaires were used (see Appendix B). The surveys were conducted by the following partners: the University of Linz (Austria), the Swiss Graduate School of Public Administration of Lausanne University (Switzerland), the Municipal Technology Company Of Amaroussion (Greece), and the National Centre for Scientific Research Demokritos (Greece).

This document will concentrate on portraying the results of the surveys conducted among citizens and business representatives and analysing them in the light of the surveys conducted within public administrations. The total number of respondents in each country and each group is shown in the table below. The methodology of the study is described in more detail in Deliverable 1.2.1.

Country	Citizen	Business	Public Authorities
Austria	56	10	14
Switzerland	28	14	9
Greece	126	28	16
Total	210	52	39

The objective of the study was to select portal features that would respond to the needs of different user groups. The features are presented in chapter 6.2. Although the statistical analyses of the survey results presented in the following are rather descriptive by nature, the user requirements for the portal platform may be derived from them. Yet, one should bear in mind that the aim is not to define the desired portal features solely on the basis of these analyses.

The requirements were derived from a set of questions that was related to portal features. The questions were mostly multiple-choice questions and posed so that the interviewees had the possibility to choose the alternative that best described their opinion. Relevant questions regarding services and general background information were also used in order to further elaborate the requirements.

The respondents of different groups were categorised in a uniform fashion in the charts presented in this report. The citizen interviewees were grouped by gender and age, the business representatives by country and the size of their company and the public administration representatives were simply grouped by country.

When asked about the familiarity of a Portal, both citizens and business representatives seemed to be equally well acquainted with the concept (Figure 2, Figure 3). In both cases the majority of interviewees was aware of the concept but one should bear in mind that

the conceptualisation of the term Portal may vary quite a lot even though a rough definition was given in the questionnaire¹.

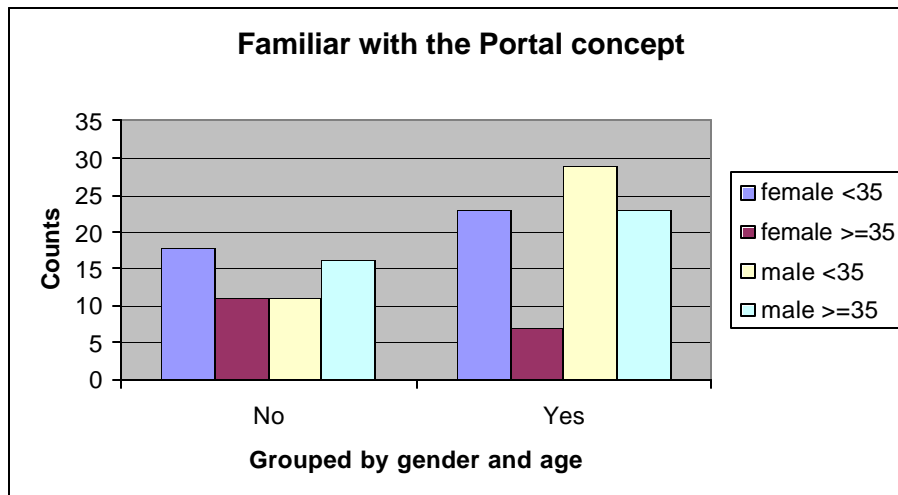


Figure 2 Citizens familiar with the Portal concept

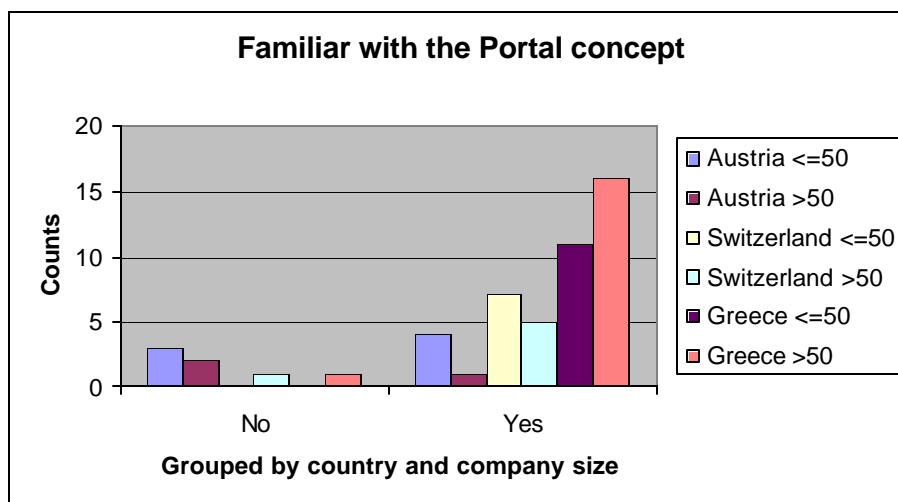


Figure 3 Business representatives familiar with the portal concept

The portal was considered important for the whole of the public sector by interviewees in both groups. Business representatives tended to emphasise the importance of a Portal slightly more than citizens (Figure 4, Figure 5). The result may also portray the fact that offering public services on the Internet was felt to be important in general and not only the importance of a Portal as such. Yet, it is safe to conclude that a Portal is generally accepted as a means of accessing public information and services.

¹ Definition: Portal is a single point of interaction with relevant applications and information.

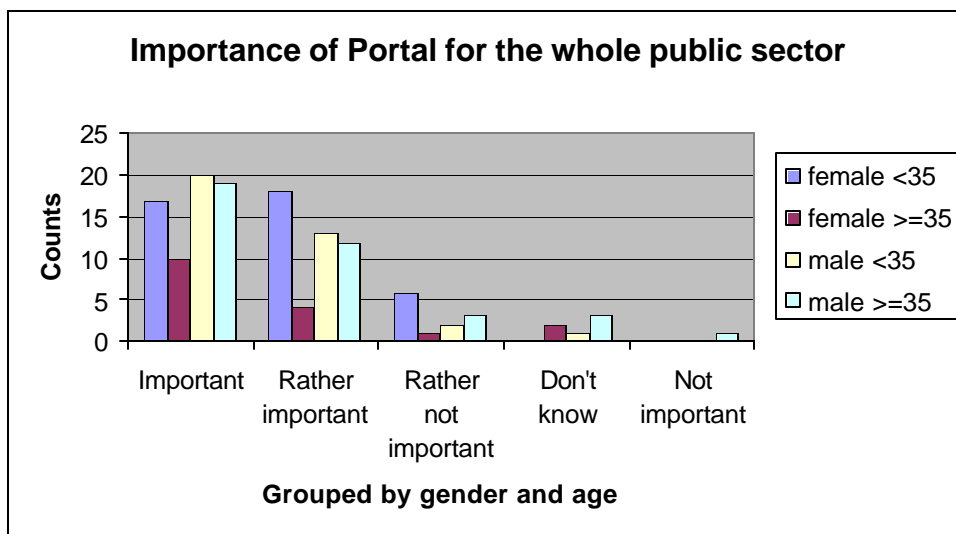


Figure 4 Importance of a Portal for the public sector according to citizens

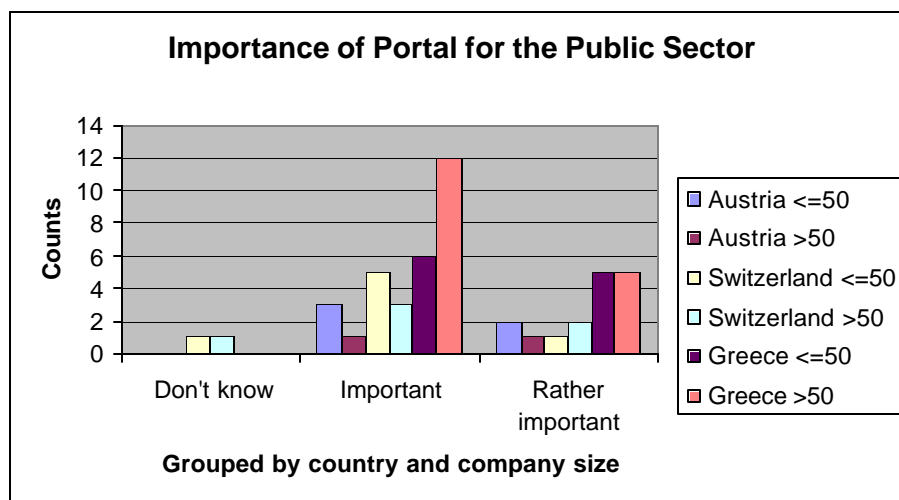


Figure 5 Importance of a Portal for the public sector according to business representatives

A loose definition of the concept of Portal, like the one given to the interviewees, does not really take a stand on the possible features of a Portal. The questionnaires included a series of questions ranging from services offered to possible portal features. The interviewees were asked to choose an alternative that best described the importance of a given feature. The aim of the adopted approach is to analyse the results according to the Portal features to be implemented.

3.1 Aggregation and external integration

The idea of a one-stop shop has been endorsed within public administration as a future service concept. Even though the concept might not be all that clear to the public, the interviewees seem to deem this as an important development path regarding portal features. Citizens seemed to be more consistent in their views than business representatives (see Figure 6 & Figure 7). Solutions for aggregating and combining information and services from different sources thus seem to be in the interest of both user groups, which also supports the idea of providing a single point of access to governmental information and services through a portal with this kind of functionality.

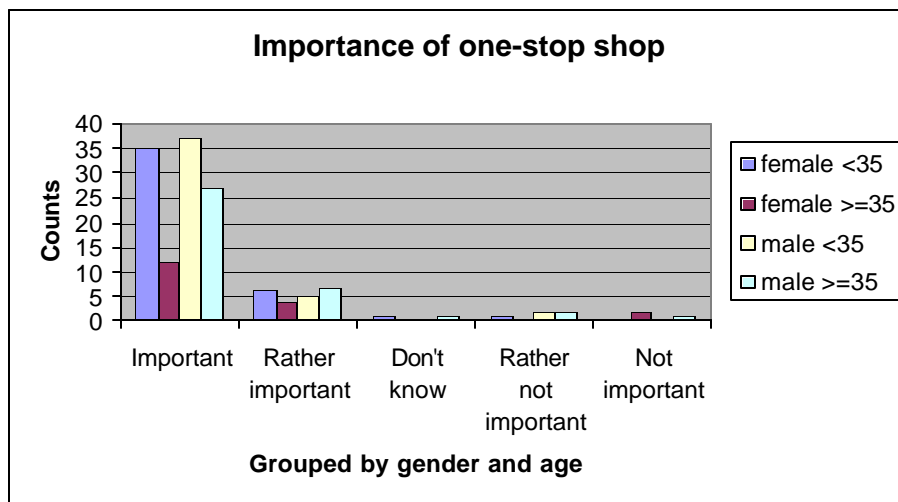


Figure 6 Importance of one-stop shop according to citizens

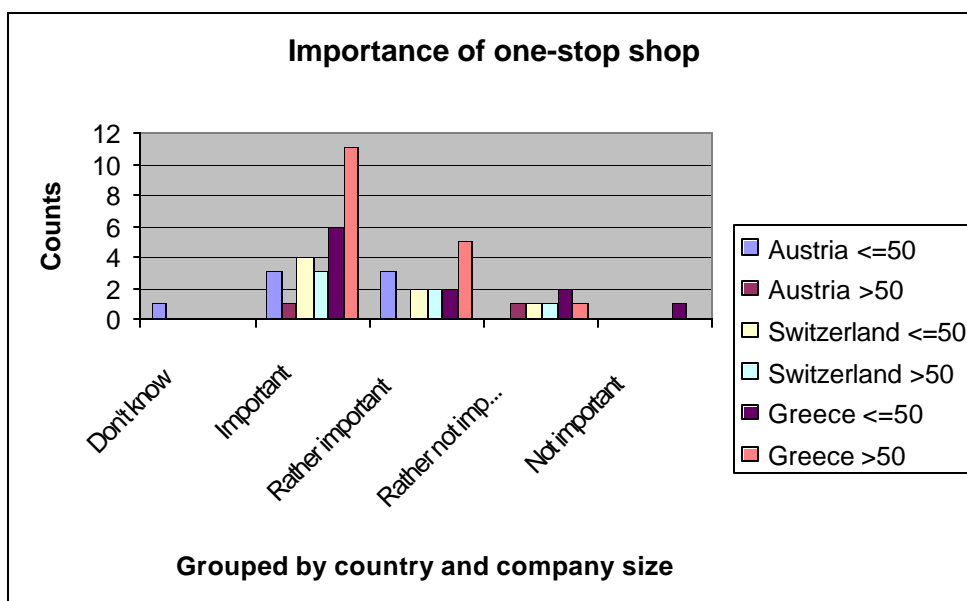


Figure 7 Importance of one-stop shop according to business representatives

The survey results among citizens and business representatives indicate support for having “external information and services” provided (Figure 8, Figure 9). Public administration representatives also seem to favour the development towards offering both public and commercial services through a single point of access (Figure 10).

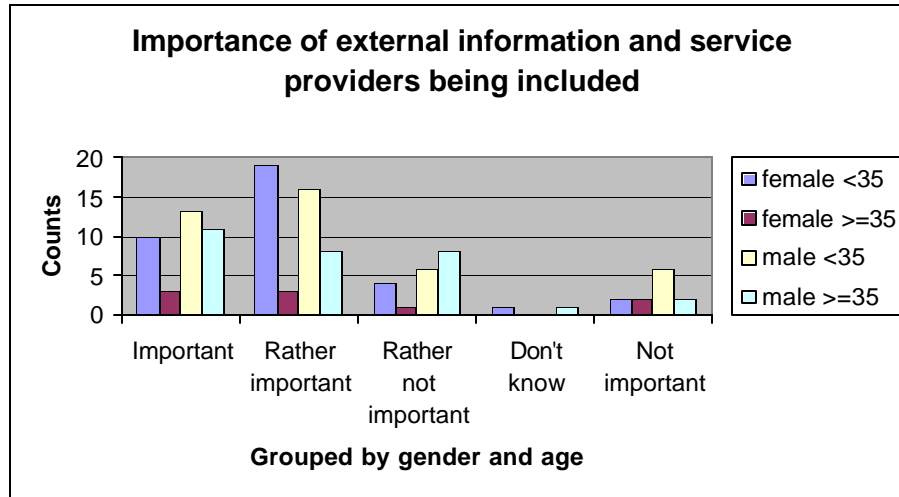


Figure 8 Importance of external information and services according to citizens

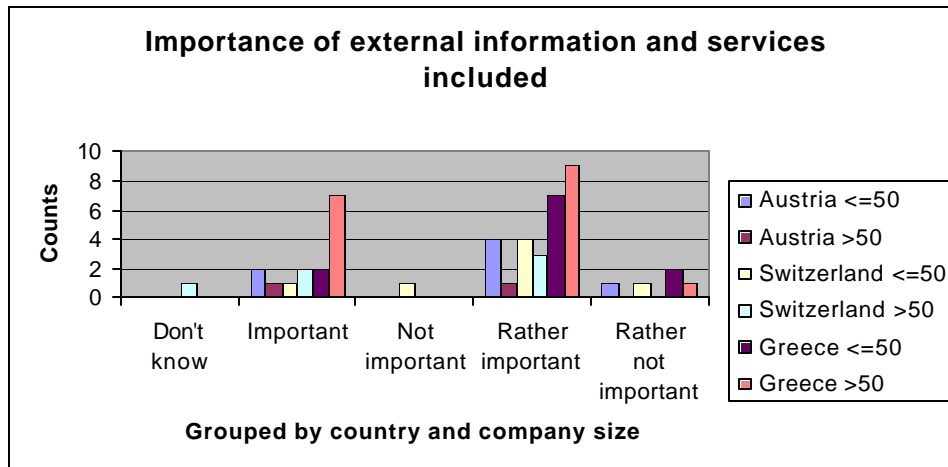


Figure 9 Importance of external information and services according to business representatives

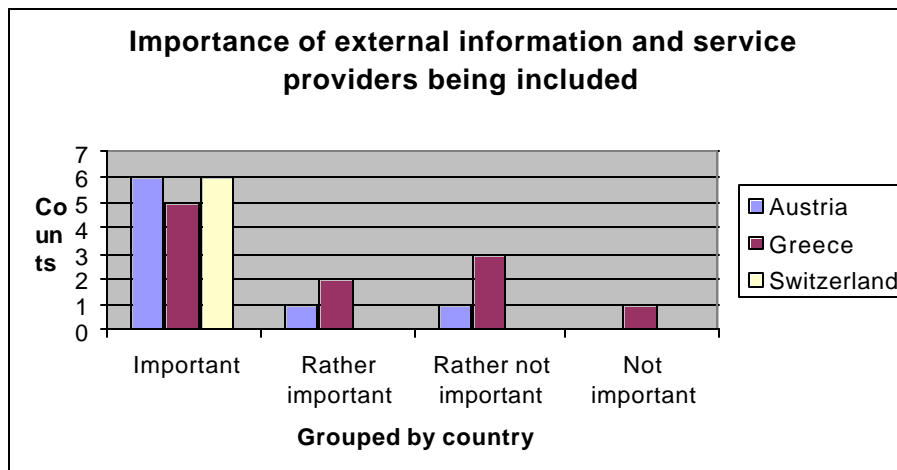


Figure 10 Importance of external information and services according to public administration representatives

The question of which external information and service providers should be included in the portal was also addressed in the survey. The interviewees were asked how important they felt that including commercial companies or non-governmental organisations would be.

When asked if including commercial companies would be important for a governmental portal the results seem rather mixed. Business representatives took a more positive stand on commercial companies being included than the respondents in the other groups (Figure 11, Figure 12, Figure 13). Even though the results show a somewhat positive attitude towards commercial companies, it is worth considering to what extent commercial companies should be included as service and information providers. One alternative would obviously be limiting the number of companies that are allowed to participate so that their presence would best benefit the portal as a whole.

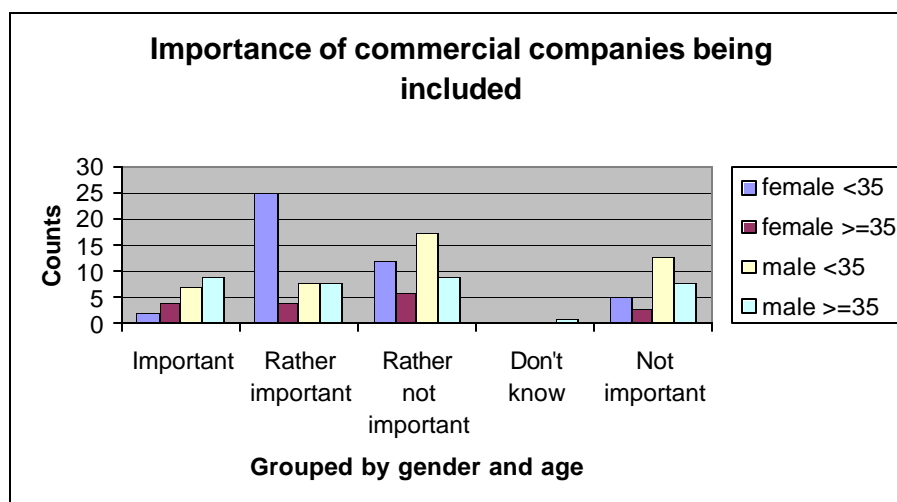


Figure 11 Importance of commercial companies being included as service and information providers according to citizens

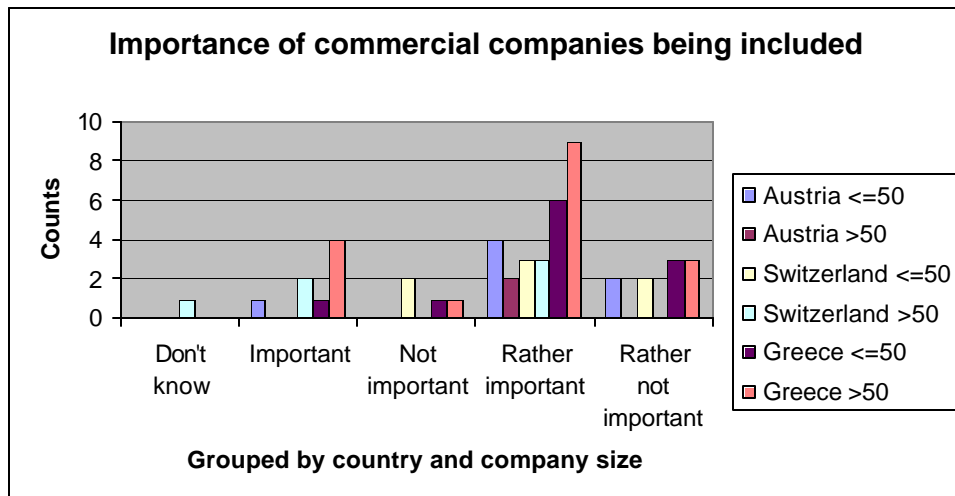


Figure 12 Importance of commercial companies being included as service and information providers according to business representatives

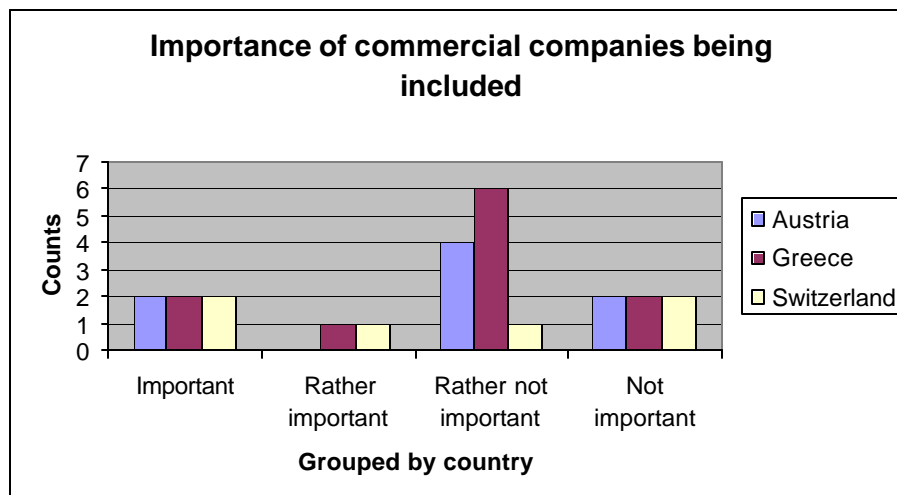


Figure 13 Importance of commercial companies being included as service and information providers according to public administration representatives

The picture remained also mixed, when the interviewees were asked about the presence of non-governmental organisations (Figure 14, Figure 15). The Swiss public administration representatives regarded the presence of non-governmental organisations as more essential than their Greek colleagues (Figure 15). This might be due to the special role that non-governmental organisations have enjoyed in Swiss society, which might have clarified the slightly vague concept of “non-governmental organisations”. Again, one should note that only Swiss and Greek data were available for analysis.

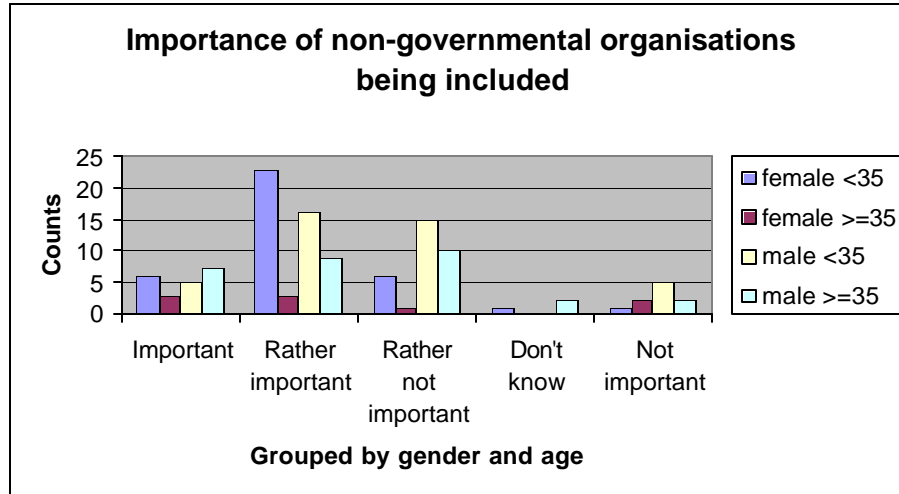


Figure 14 Importance of non -governmental organisations being included as information and service providers according to citizens

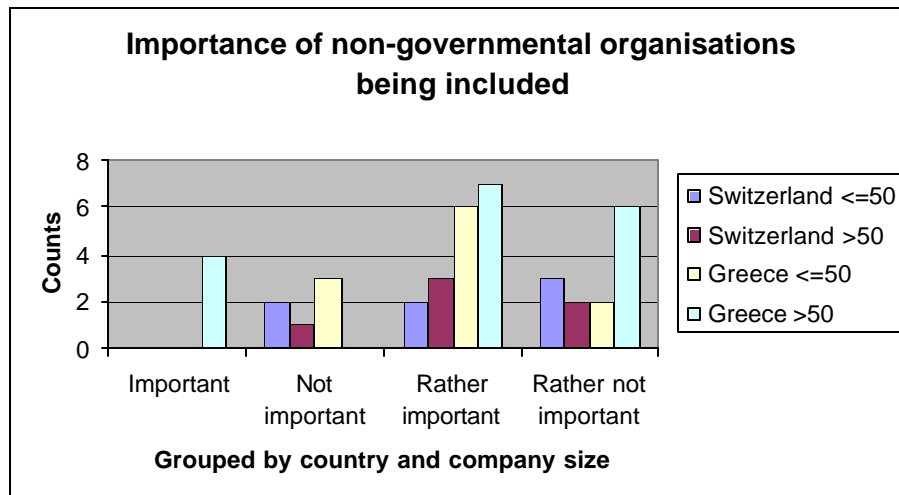


Figure 15 Importance of non-governmental organisations being included as service and information providers according to business representatives

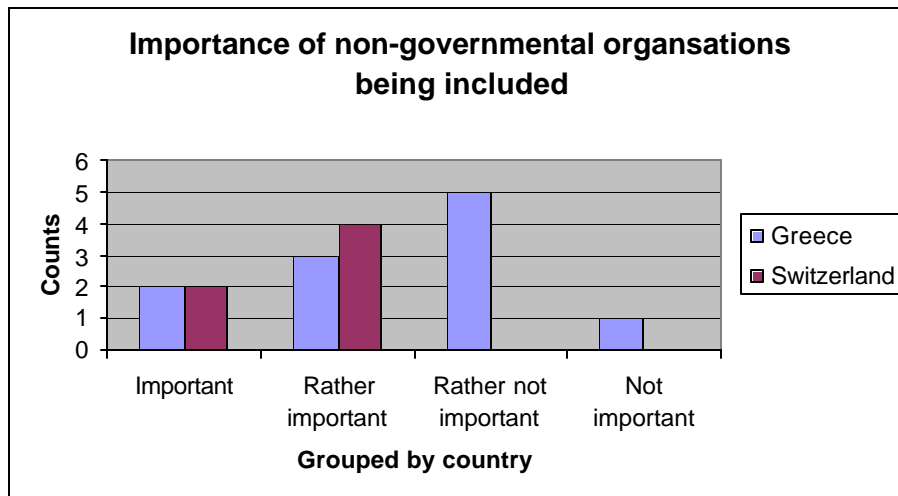


Figure 16 Importance of non -governmental organisations being included as service and information providers according to public administration representatives

Public administration representatives were also asked how important they felt that it would be to offer data centrally for distribution regardless of its origin (Figure 17). Even though the opinions varied a bit, it is possible to conclude that the majority favoured the possibility of offering information centrally for distribution regardless of where it was being produced or updated.

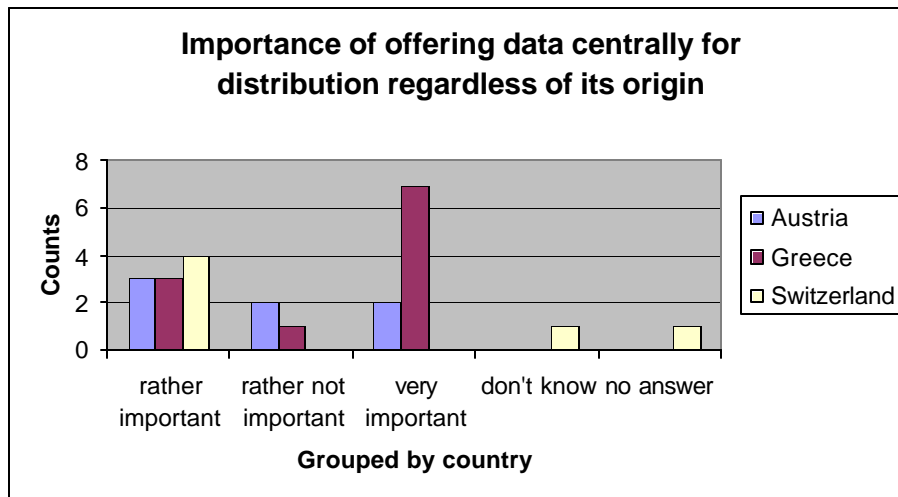


Figure 17 Importance of offering data centrally for distribution regardless of its origin according to public administration representatives

When asked what shape the public administration representatives presumed their future content management model would take, the answers showed that the future model is not likely to be solely centralised by nature (Figure 18). This also stresses the importance of the ability to aggregate and integrate information from different sources.

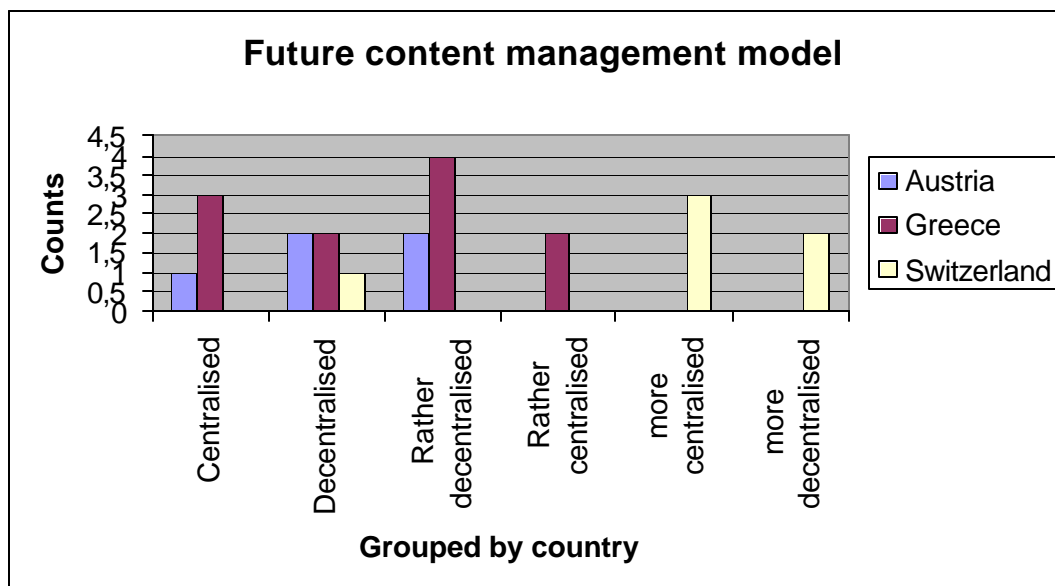


Figure 18 Assumed future content management model in public administrations

Conclusion:

The results on the aggregation of information and services and the integration of external information indicate that these features are generally regarded as important, while slight scepticism towards certain possible external information and service providers prevails. The majority of the public authorities that participated in the survey favoured the possibility of offering information centrally for distribution regardless of where it was produced or updated. Since the future content management model will probably be rather decentralised by nature, the ability to aggregate and integrate content and services can be seen as a necessity for a governmental portal. These issues have also been addressed in connection with the eGOV architecture (see chapters 6.4.1 & 6.4.2).

3.2 Categorising content, searching for information

The method of content categorisation and the means for searching information may form the key functionality in a Portal from the user point of view. Content categorisation is also connected with usability issues and the means of updating the content. The aim to aggregate content and services from different sources regardless of the origin emphasises the need to use a thematic categorisation based on related topics. The user requirements also seem to point out the importance of thematically structured content. Citizens tend to regard thematically structured content as extremely or very important, business representatives as important or rather important (Figure 19, Figure 20).

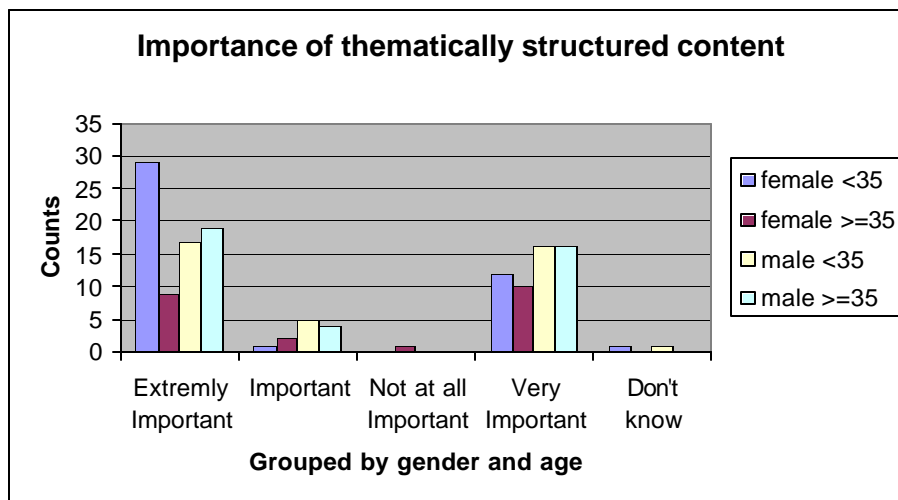


Figure 19 Importance of thematically structured content according to citizens

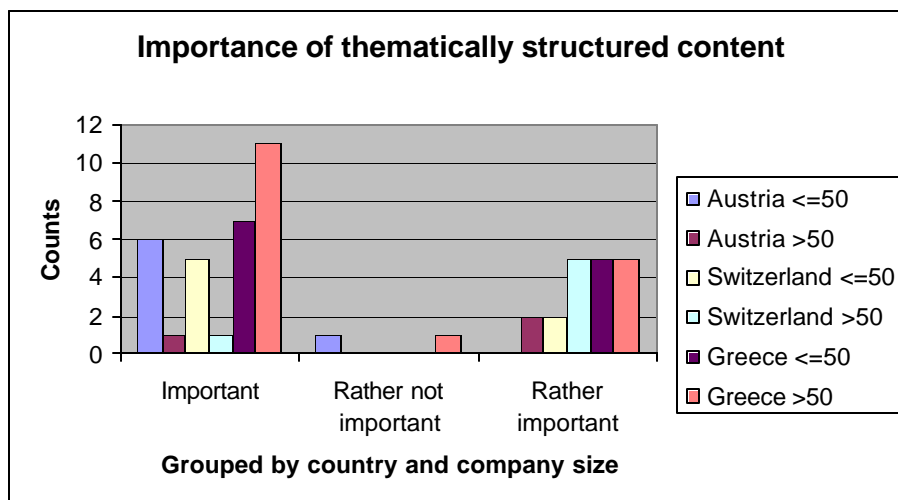


Figure 20 Importance of thematically structured content according to business representatives

When the interviewees were asked whether they would rather have their services categorised by service providers or by related topics, both business representatives and citizens clearly favoured the categorisation by related topics (Figure 21, Figure 22). A

decision to choose a life event-based categorisation, as intended in the eGOV-project, seems therefore to be well founded. The Austrian respondents were already fairly well acquainted with the concept of life event since it has been used by HELP (www.help.gv.at), the national e-government portal of the Austrian government. Therefore 'life event' was used as an alternative in Austria.

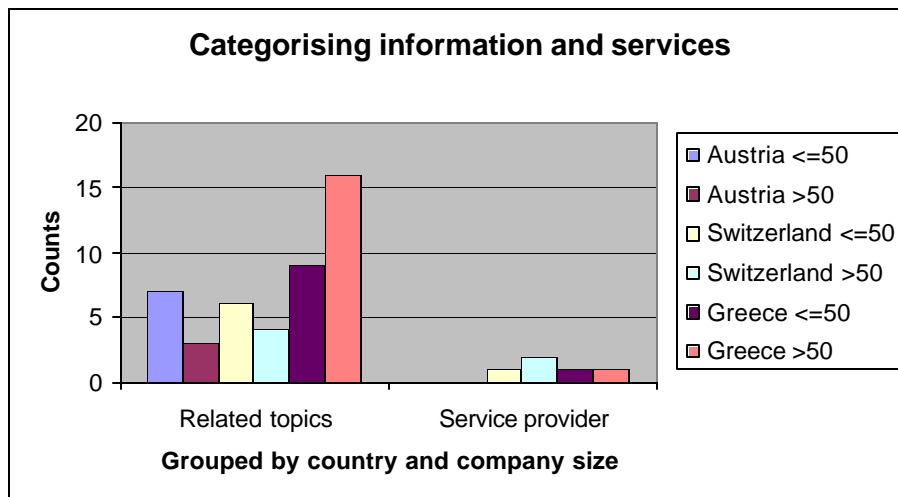


Figure 21 Preferred categorisation of information and services by business representatives

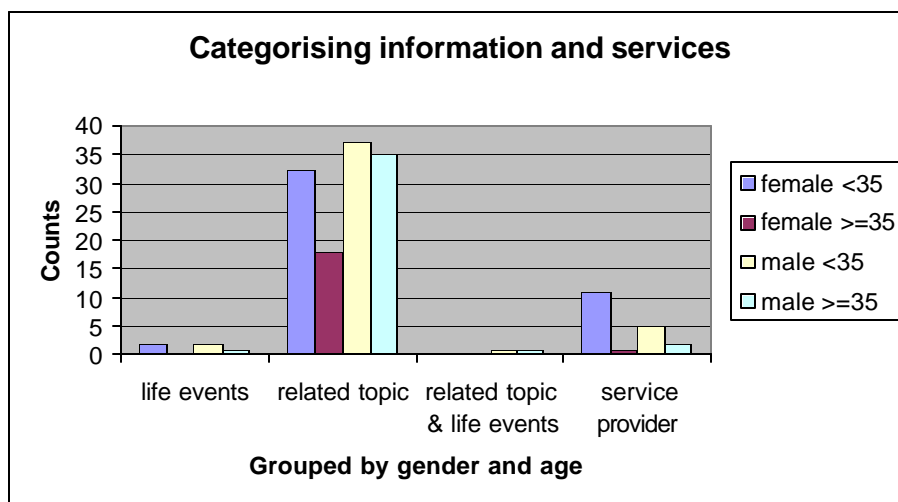


Figure 22 Preferred categorisation of information and services by citizens

The choice of technique for providing the information may be evaluated in the light of the users' prior experience. Business representatives were asked which of the given techniques they had used for searching information on the Internet. Almost all interviewees had prior experience of using search engines (Altavista, Google, etc.). Directories (Yahoo, etc.) were less commonly used, and virtual libraries and agent services were hardly used at all (Figure 23, Figure 24, Figure 25, Figure 26).

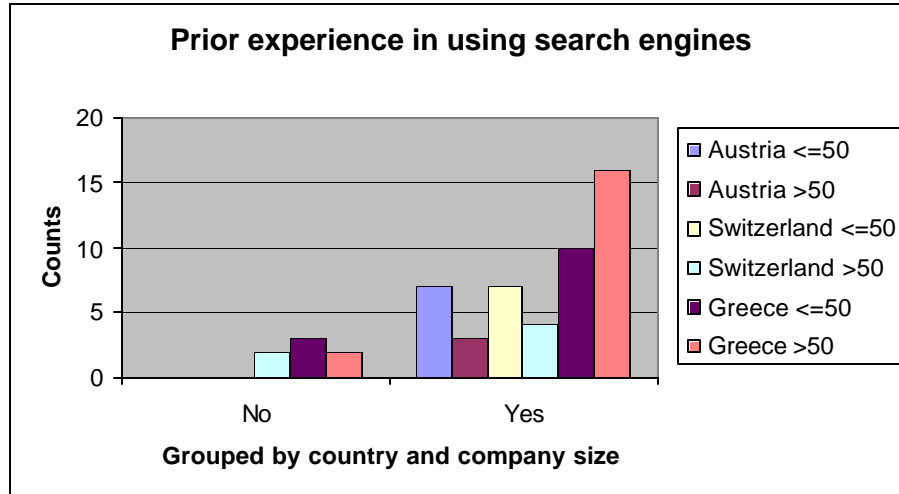


Figure 23 Prior experience in using search engines among business representatives

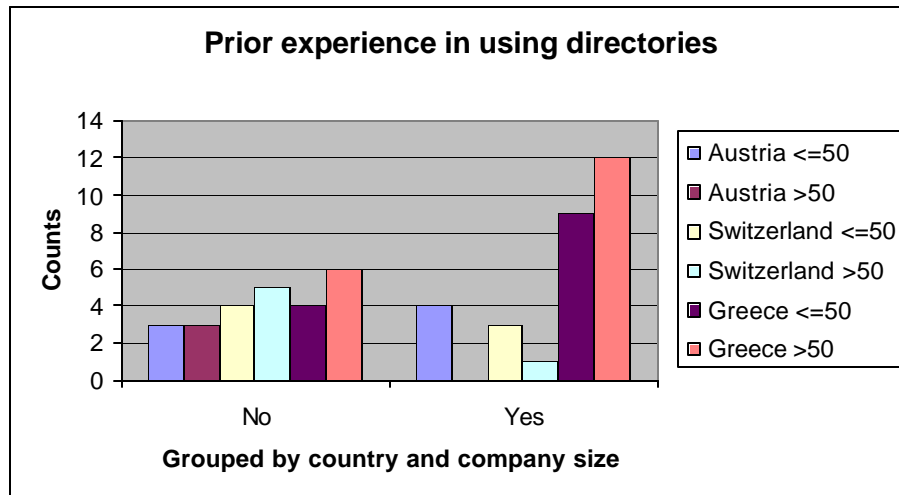


Figure 24 Prior experience in using directories among business representatives

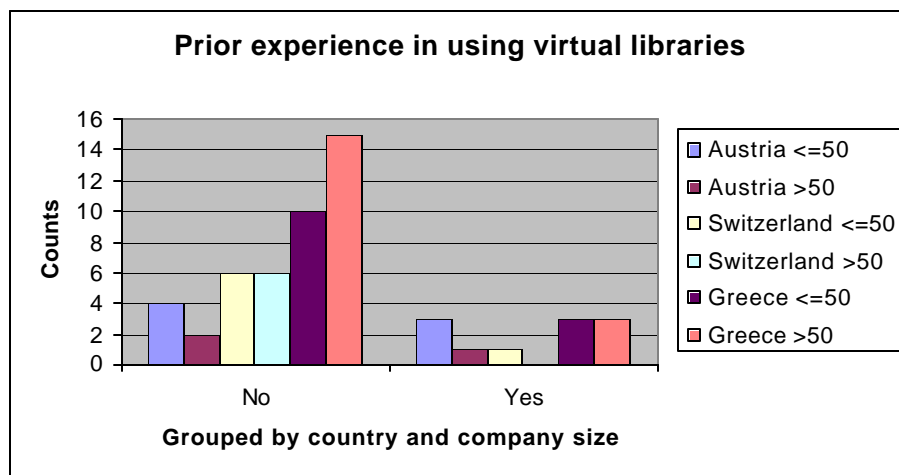


Figure 25 Prior experience in using virtual libraries among business representatives

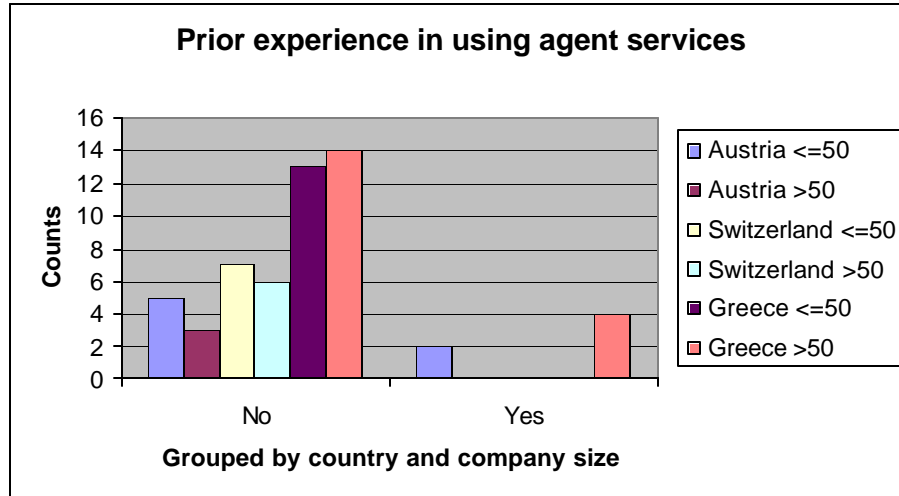


Figure 26 Prior experience in using agent services among business representatives

Offering the information and services is closely linked with usability issues. High autonomy in customising content retrieval might lead to a user interface that is more demanding for the user. The interviewees were asked how important they felt that the ease of use of the portal was. The citizen interviewees seemed to favour the relative ease of using a portal, whereas business representatives gave interestingly enough a somewhat mixed response (Figure 27, Figure 28). This might indicate some sort of perceived trade-off between usability and other functionality. All in all, usability was felt to be of importance by both groups.

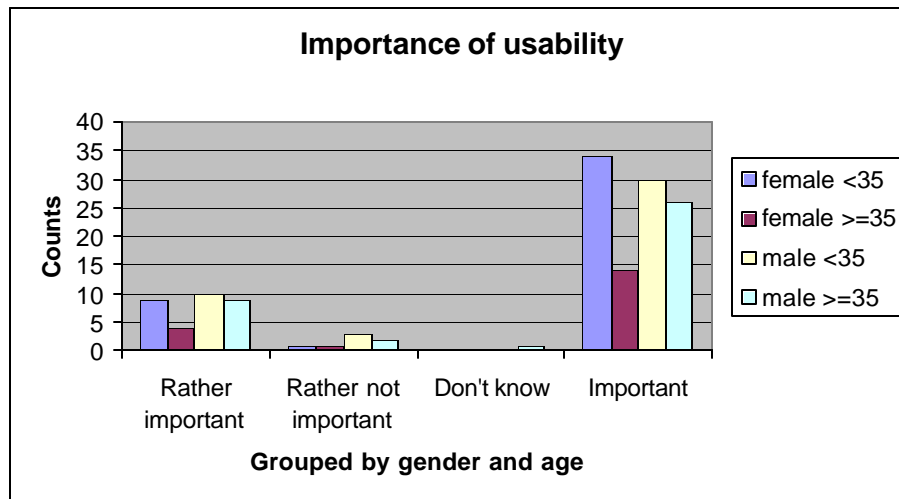


Figure 27 Importance of usability according to citizens

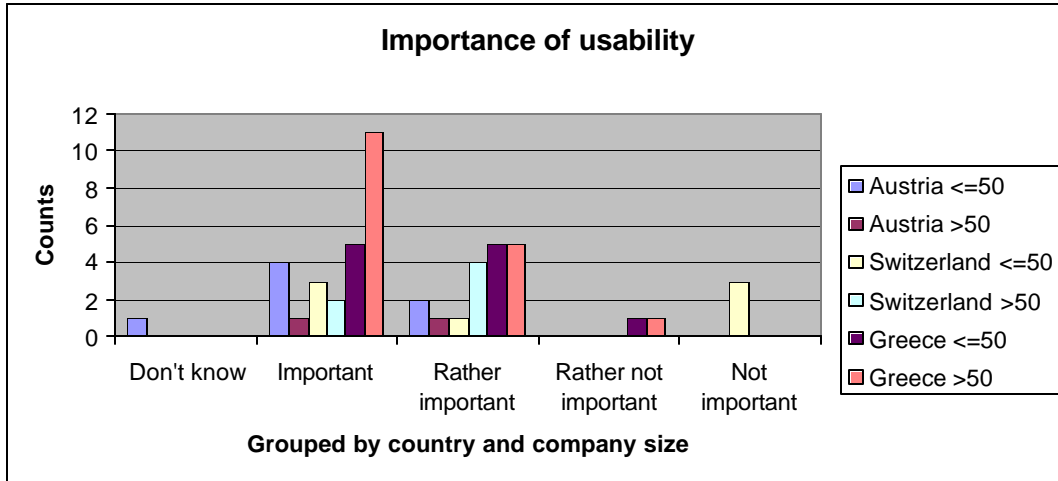


Figure 28 Importance of usability according to business representatives

The conclusion was that limited autonomy in personalising the content and services provided could in fact enhance the usability of the portal. One solution could be ready-made profiles that would allow the users to choose a group of life/business events that best suited their phase in life.

Public administration representatives also regarded thematically structured content as important (Figure 29). It thus seems that a thematically oriented content categorisation based on related topics is in the interest of everyone concerned. This sort of content categorisation requires the use of metadata. When public administration representatives were asked whether they regarded the use of metadata as important for their future services, they highly agreed on its importance (Figure 30).

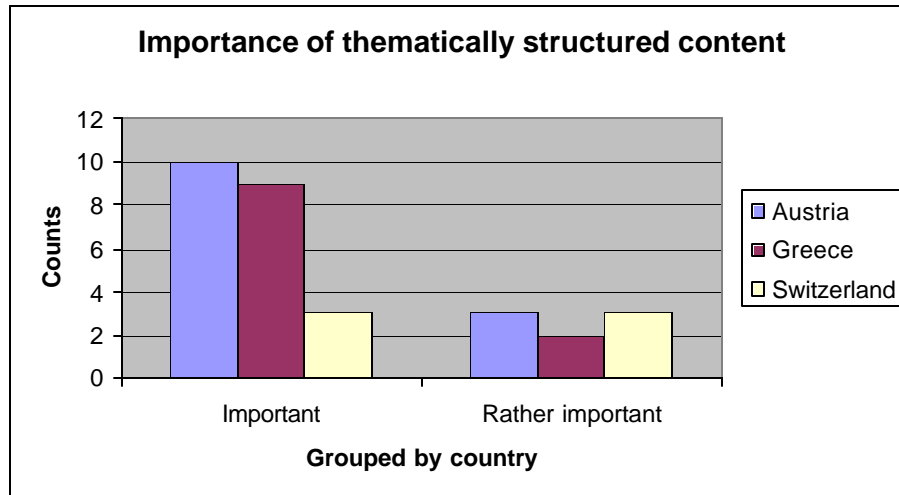


Figure 29 Importance of thematically structured content according to public administration representatives

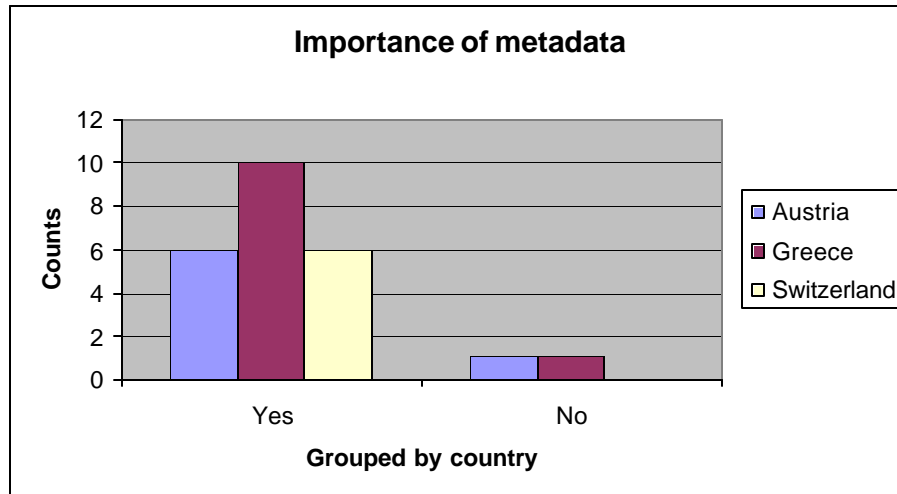


Figure 30 Importance of metadata for future services according to public administration representatives

Conclusion:

All in all, content categorisation based on related topics seems to be in the common interest of citizens, business representatives and public administration representatives, all alike. The importance of up-to-date information and usability should also be acknowledged. Thematically structured content grouped by life events with search functionality could thus best serve customer interests. Bearing in mind the need of aggregating information, federated searches for both content and services should be considered. This could be realised with a technical concept represented in chapters 6.4.1 and 6.4.2. For enhanced usability, a possibility to choose from some ready-made profiles should also be considered.

3.3 Personalisation

In the following, the issues of personalisation and customised services have been assessed in relation to the frequency of use. When the citizens and business representatives were asked about the importance of the ability to personalise the portal, the responses were rather mixed (Figure 31, Figure 32). This might also be due to a misconception of the term personalisation since some negative connotations may also be attached to it. Yet, public services may also be regarded rather as administration driven by nature, thus leaving somewhat limited need for personalised services.

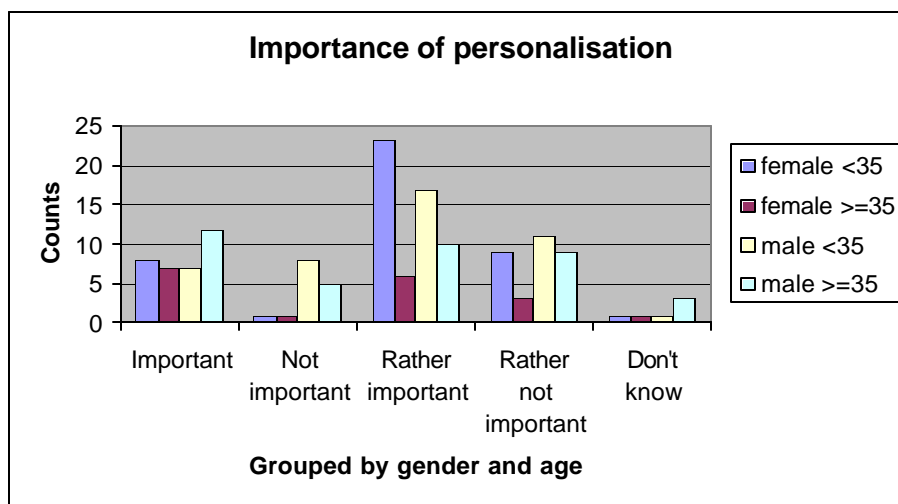


Figure 31 Importance of personalisation according to citizens

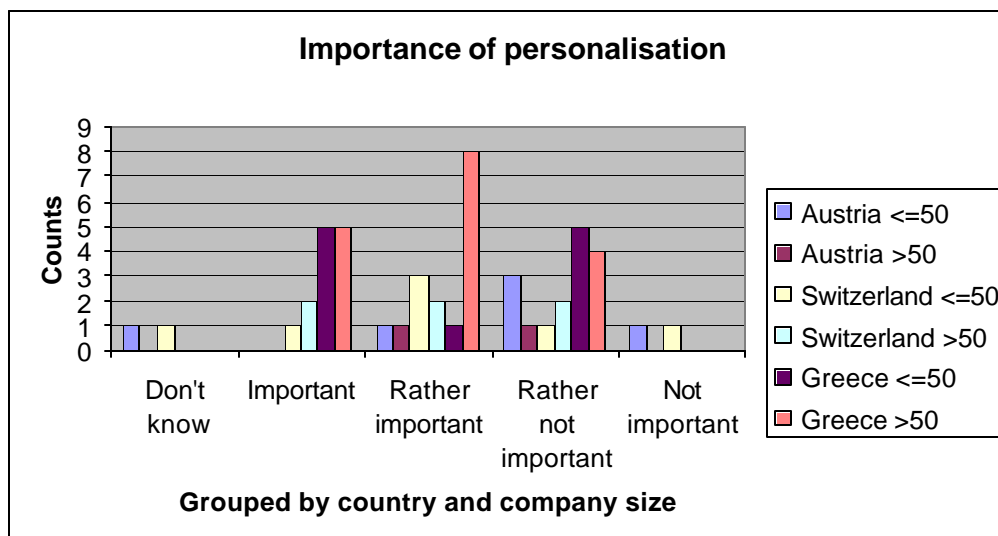


Figure 32 Importance of personalisation according to business representatives

When the interviewees were asked whether they were interested in having user-specified customised services, citizens tended to take a more positive stand than business representatives. Yet, user-specific services were not clearly regarded as being of great

importance by either of the groups (Figure 33, Figure 34). This seems consistent with the results on the ability to personalise the user.

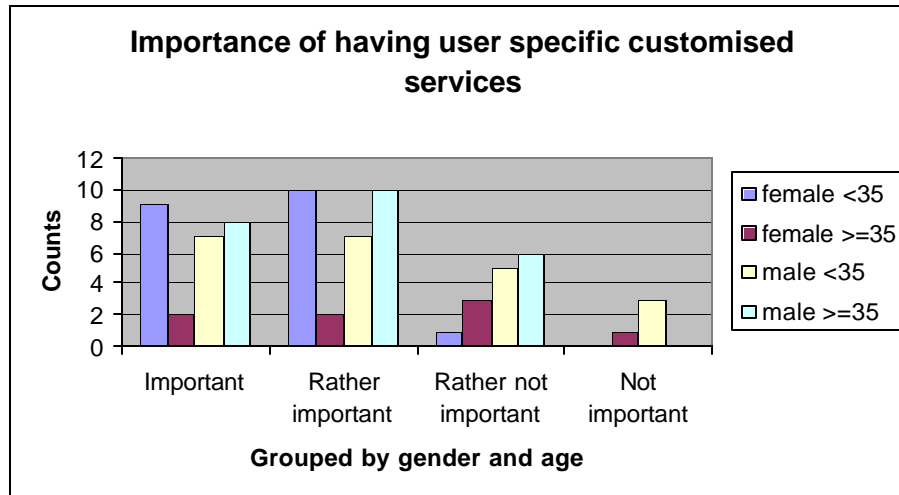


Figure 33 Importance of having user-specific customised services according to citizens

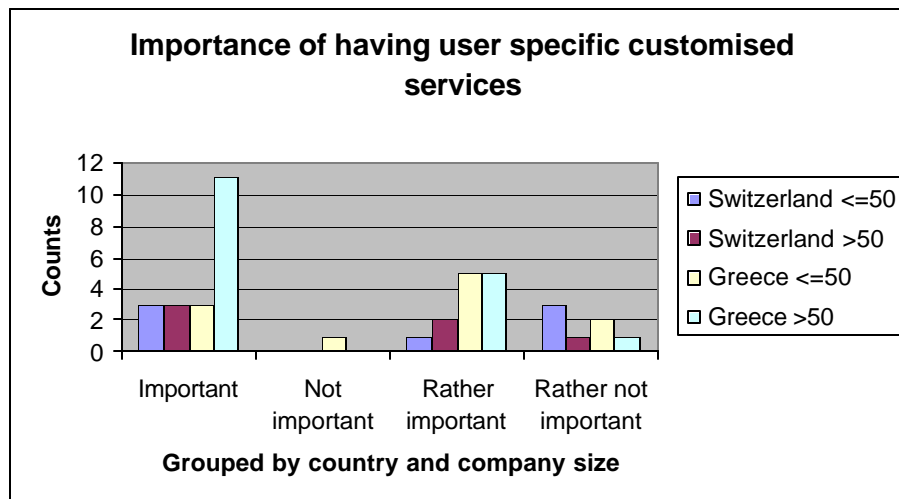


Figure 34 Importance of having user -specific customised services according to business representatives

One explanation to the rather limited interest in having user-related personalised services and customisation might be drawn from the nature of the services provided and the frequency of their use. Most public services are usually not recurrent but rather related to a given phase in life, which does not necessarily call for detailed user-specific functionality. When the respondents were asked how often they use the Internet for searching governmental information, the interviewees in both groups used the currently available service randomly (Figure 35, Figure 36).

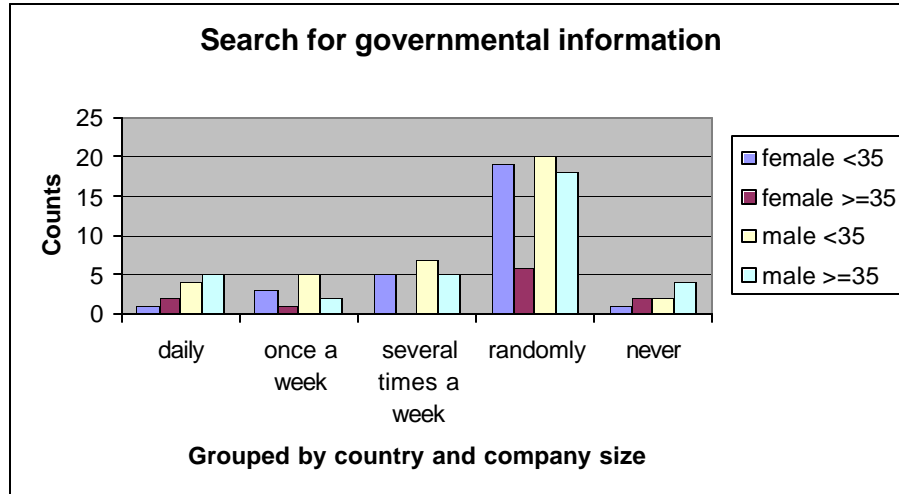


Figure 35 Frequency in searching governmental information among citizens

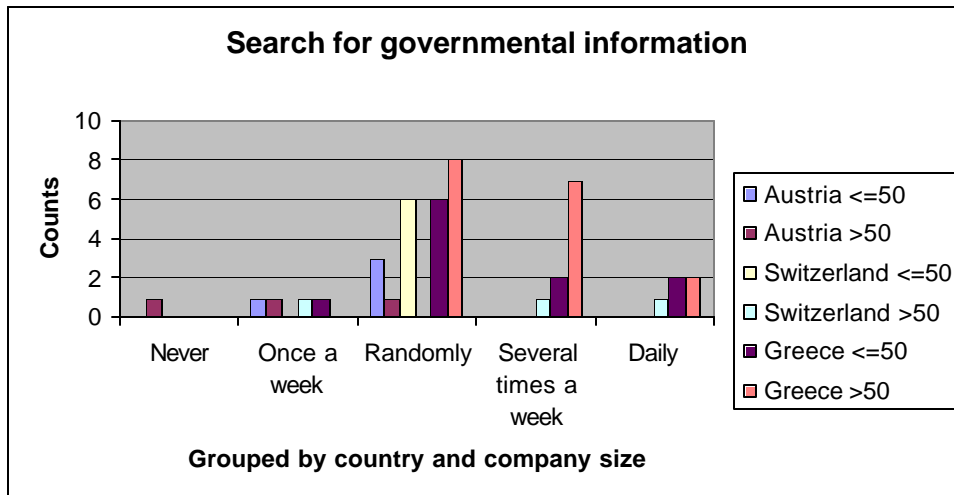


Figure 36 Frequency in searching for governmental information among business representatives

Public administration representatives felt that offering personalised services was more importance than the respondents in the citizen and business groups (Figure 37). They also felt that future public services would benefit from user authentication and personalisation (Figure 38).

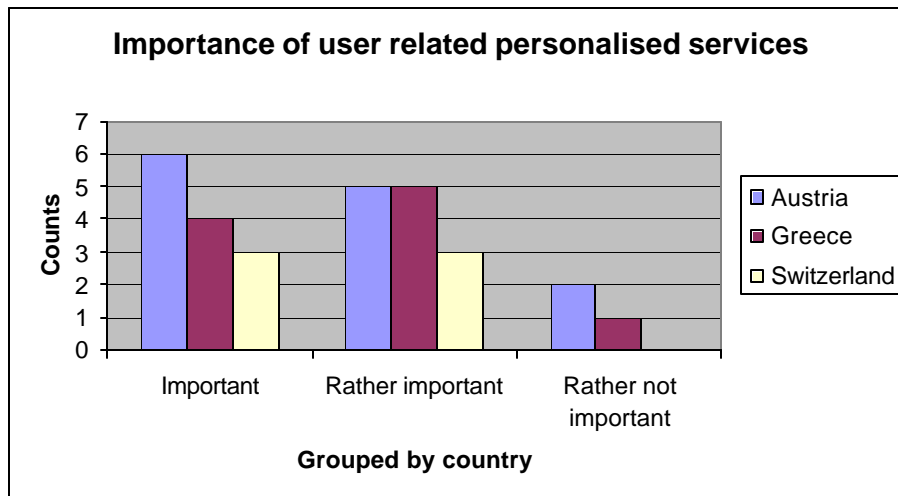


Figure 37 Importance of user-related personalised services according to public administration representatives

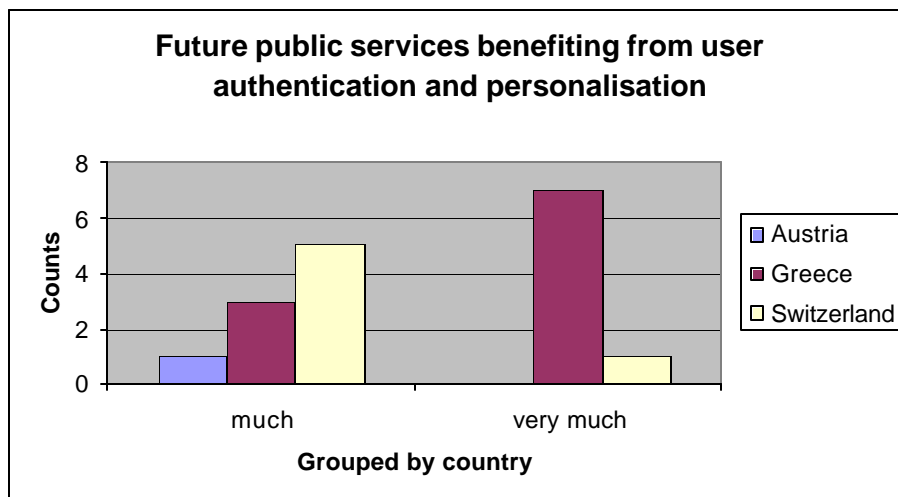


Figure 38 Future public services benefiting from user authentication and personalisation according to public administration representatives

Conclusion:

According to the views of citizens and business representatives, personalisation seems necessary only to some limited extent. Yet, public administration representatives seemed rather keen on having this sort of functionality available. One solution might be dividing the matter of personalisation into two categories: user-driven personalisation and administration-driven personalisation. The portal administrator could for example define some ready-made profiles based on life events for the user to choose from. User authentication should be provided in order to enable the provision of services requiring it. Since only some of the services require user authentication, the portal should also enable anonymous use. User personalisation and authentication have also been covered when discussing the architecture (see chapters 4.3 & 6.2). On the other hand, user authentication is important for security issues as well.

3.4 Security

Public services usually tend to have several security and privacy implications. The majority in both groups regarded security clearly as an important issue and hardly any of the interviewees felt that it was a matter of little importance (Figure 39, Figure 40).

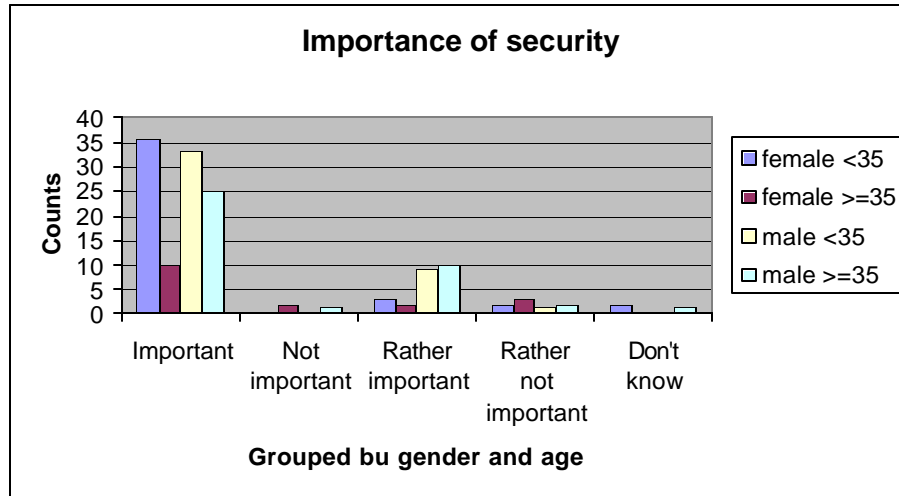


Figure 39 Importance of security issues according to citizens

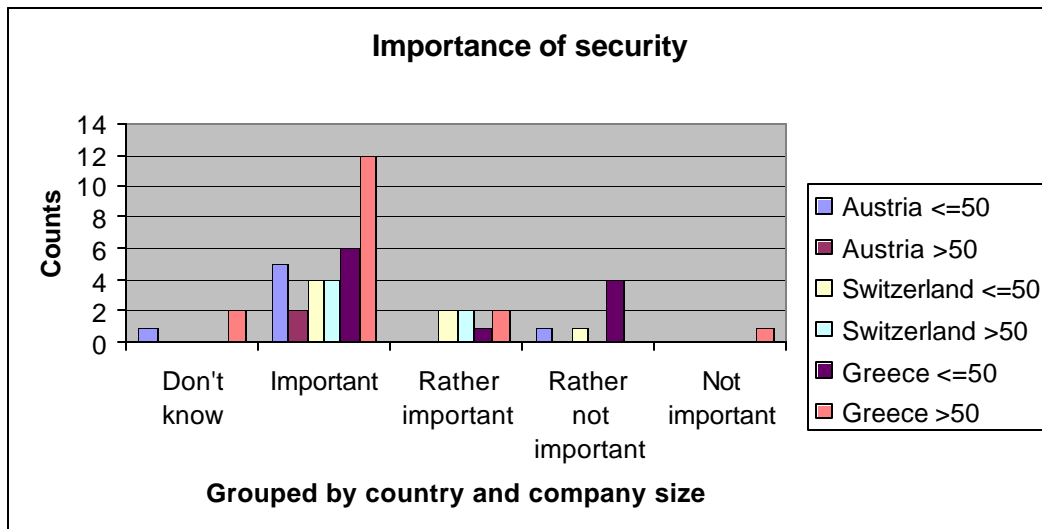


Figure 40 Importance of security issues according to business representatives

The vast majority of the interviewees also regarded privacy as an important issue (Figure 41, Figure 42). Even though the question (whether issues such as security and privacy are of importance) might be rather leading by nature, it is safe to conclude that these issues definitely matter.

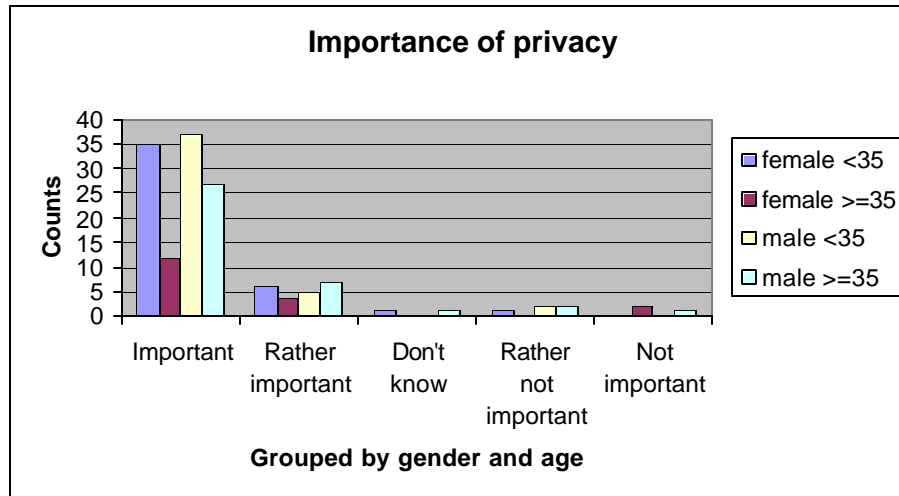


Figure 41 Importance of privacy issues according to citizens

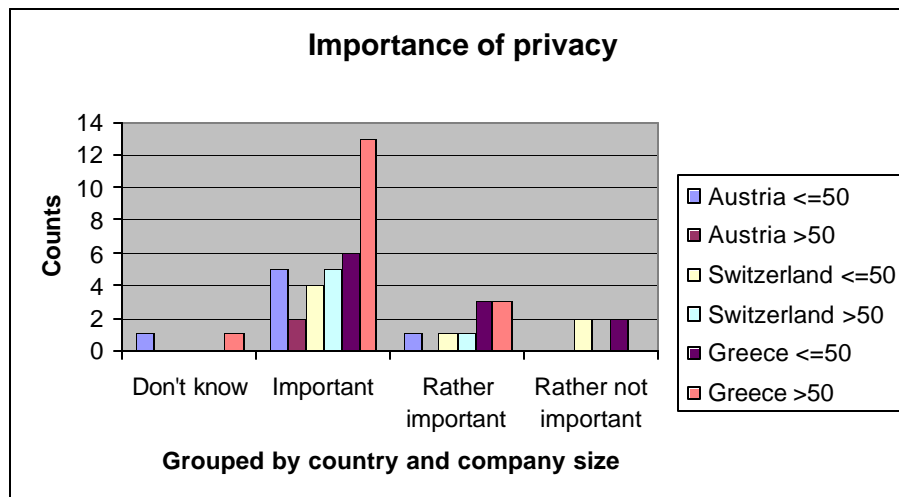


Figure 42 Importance of privacy issues according to business representatives

Conclusions:

Public data often contain confidential information, and security issues seem to be of high importance to the respondents as well. This can be seen as relevant for the requirements concerning both the portal and the system architecture as a whole (see chapters 4.1, 5.2.1, 5.2.3). Security issues should therefore be carefully assessed during the development of the portal. Again, one should keep in mind the diversity of information and services provided and their different implications to security issues. Thus, the necessary level of security should be assessed for each part of the portal individually.

3.5 Notification facility

The interviewees were asked about the possibility of having push-services available. Both respondent groups were asked whether they would like to have a reminder sent to them on a recurring financial transaction such as tax and utility bills (Figure 43, Figure 44). Both business representatives and citizens favoured this quite unanimously. Even if one cannot generalise these findings too much, it seems fair to say that the respondents are in favour of this sort of functionality as such, provided that it serves their interest.

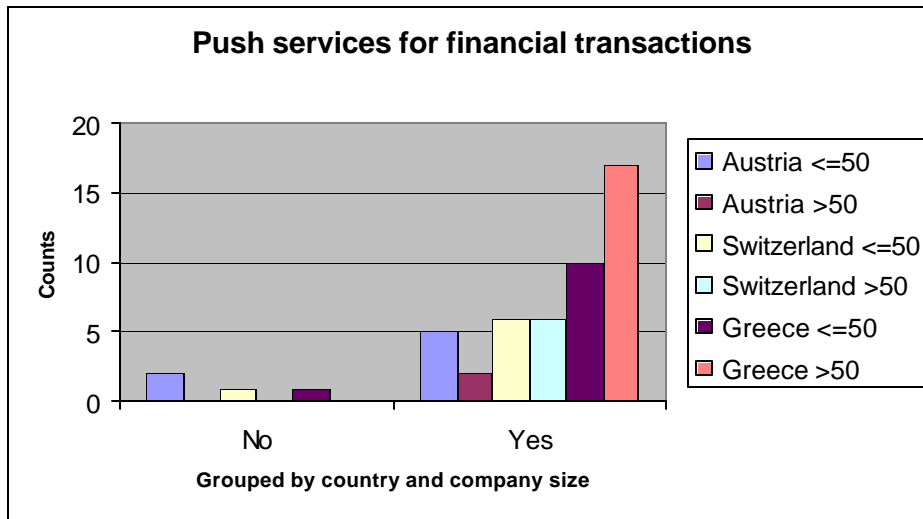


Figure 43 Business representatives' interest in having push services regarding financial transactions

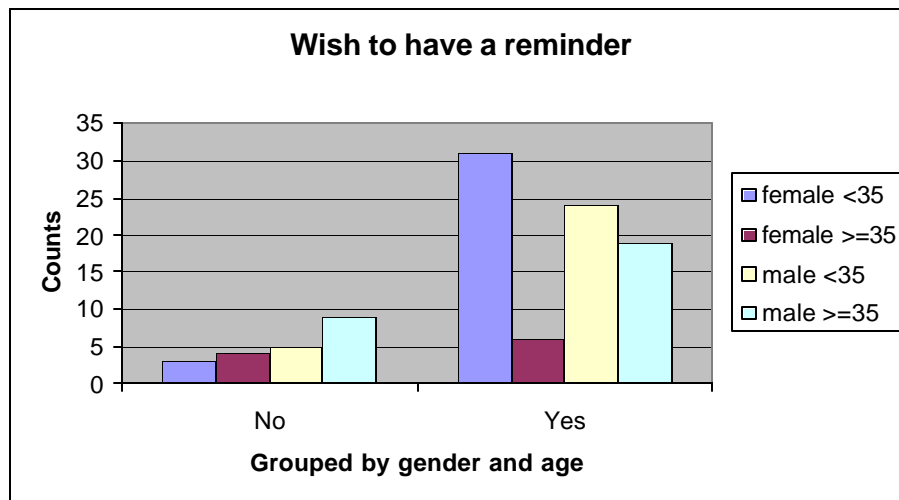


Figure 44 Citizens' interested in having push services

Conclusion:

There seems to be an interest in push services among the respondents. A notification service that would enable simple push services for example on recurring transactions should thus be considered. These services could also be available through mobile devices (see also chapter 6.2).

3.6 Wireless support

Both citizens and business representatives were asked about the importance of delivering public services through mobile phones. In neither of the groups was this felt to be of great importance but rather fairly unimportant, which might indicate the possible disappointment in the already existing commercial mobile services (Figure 45, Figure 46). The public administration representatives seemed to more or less favour the development of mobile services. When they were asked how important they felt that the support of wireless technologies would be in the future, the majority of respondents tended to emphasise it, although there were some differences between the countries (Figure 47).

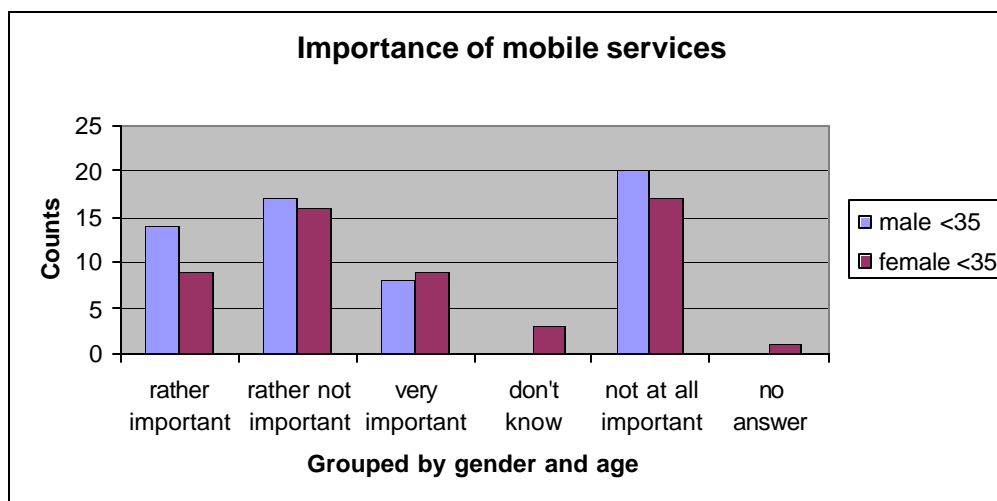


Figure 45 Importance of mobile services according to citizens

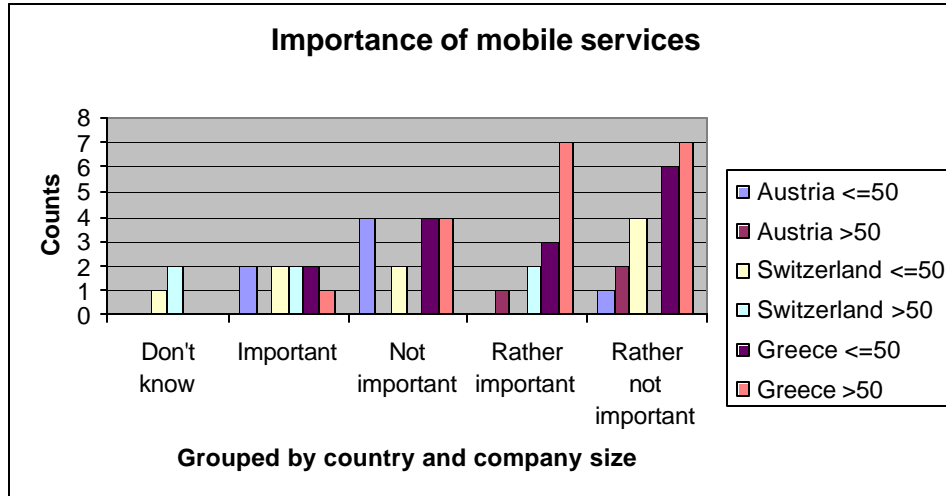


Figure 46 Importance of mobile services according to business representatives

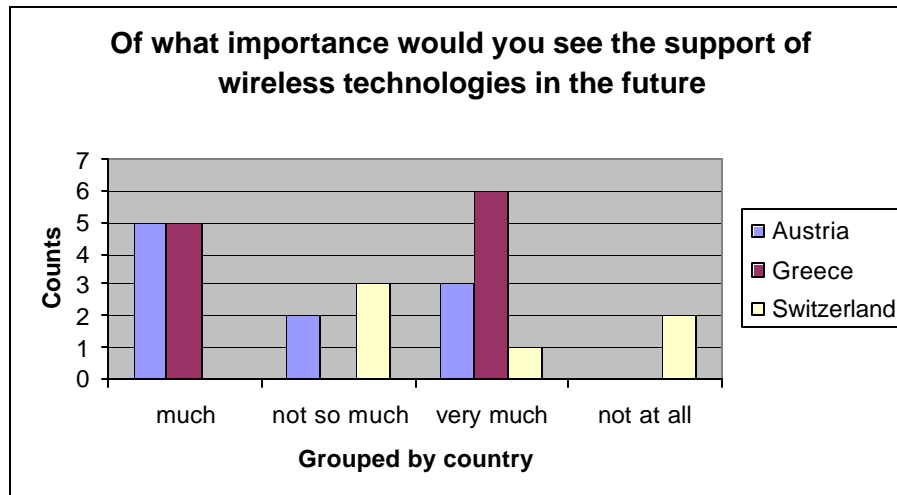


Figure 47 Importance of supporting wireless technologies in the future according to public administration representatives

Conclusion:

One should bear in mind the rather mixed response to the mobile services, when the scale and the scope of mobile support are being set. Yet, the project objectives emphasise gaining experience from mobile services as well. As bottom line one might conclude that one should assess carefully what sort of mobile services are sensible to implement and what could be learned from the already existing services. These issues are also noted when discussing the architecture (see chapters 5.2.2, 6.2).

3.7 Extensibility and programmability

The issue of further developing the eGOV Portal concept endorses extensibility and programmability as well as the use of open standards. These are essential for creating a platform-independent concept that can be adjusted to the growing future needs. Citizens and business representatives were asked how interested they would be in having application interfaces provided. Answers from citizens seem to be rather mixed, which again can be due to the wording of the question that leaves plenty of room for different interpretations (Figure 48), as the respondents might not have understood the concept of application interfaces similarly. Then again the issue might also have been of little relevance to many of the respondents. Business data were only available from Switzerland, which allows little generalisation. Yet, the Swiss business representatives tended to favour the possibility of having application interfaces available (Figure 49).

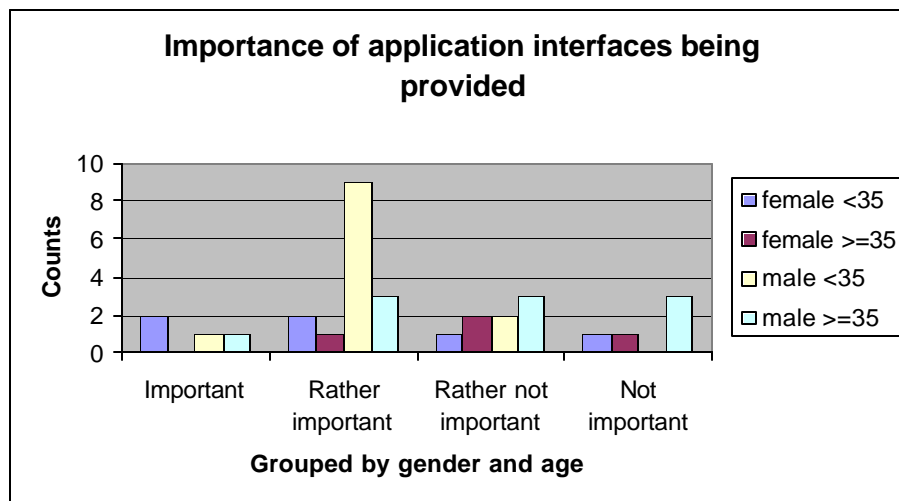


Figure 48 Importance of application interfaces being provided according to citizens

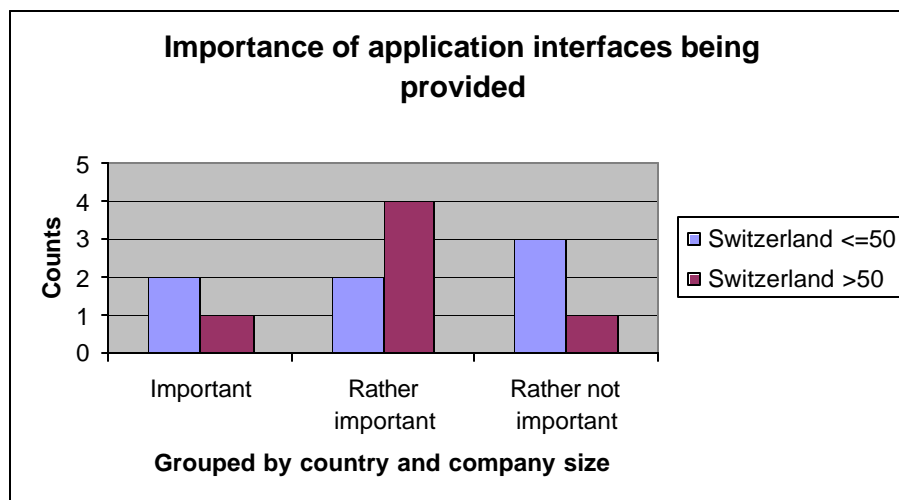


Figure 49 Importance of application interfaces being provided according to business representatives

The use of open standards was addressed in the public authorities questionnaire. The issue can be seen as being of high importance since only the use of standards and, above all, open standards can guarantee the exchange of data between different organisations with a different choice of techniques as well as the fact that application interfaces are being equally offered to the public. Open standards also ensure that an organisation will not be tied to a single software vendor after choosing a product and that the platforms can easily be further developed when necessary. Instead of committing to a single vendor an organisations can rather commit to a range of techniques developed and endorsed by many vendors. According to the survey results, public administration representatives seemed to have acknowledged the importance of standards and above all open standards (Figure 50, Figure 51).

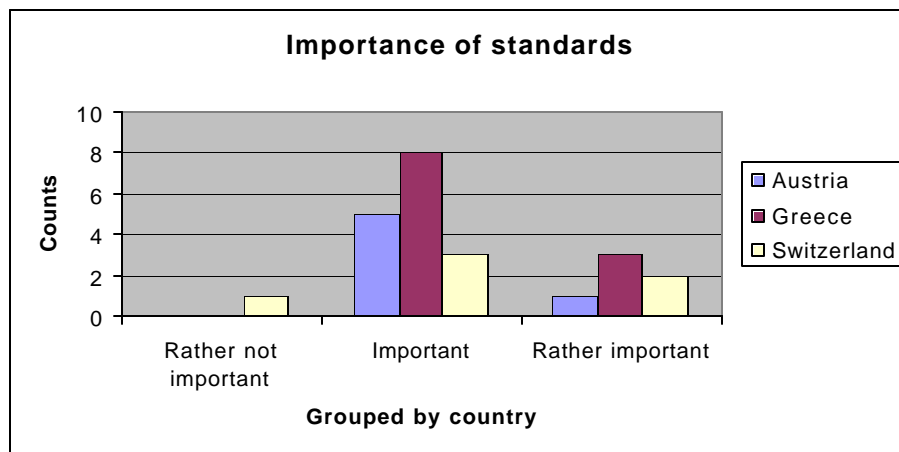


Figure 50 Importance of standards in the future according to public administration representatives

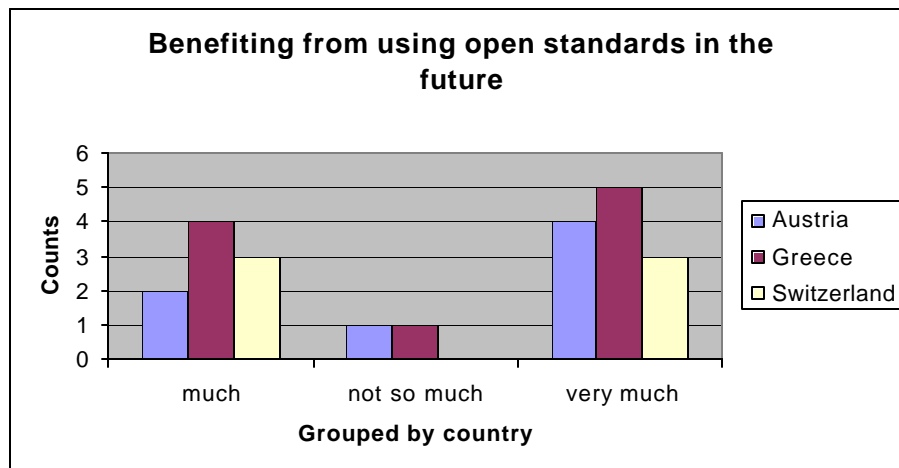


Figure 51 Organisation benefiting from using open standards in the future according to public administration representatives

Conclusion:

Despite the limited data available, one can conclude that the issues of extensibility and programmability are of high importance. The public administration interviewees seemed to have acknowledged the importance of using open standards in the field of public administration. In fact, the ability to further exploit the eGOV platform highly relies on the extensibility and programmability of the platform (see chapters 4.1, 5.2.1, 6.2).

4 System Architecture

4.1 General

The eGOV system contains one aggregation portal (eGOV) and several local portals that offer content and services to the users. The aggregation portal collects metadata from existing services and content and offers the users a single point of access (one stop government). The local portal can be an already existing portal or a new one that takes advantage of the new network architecture (SCE, SRE and SR) that will be developed during the project.

The service creation environment offers tools that authorities can use for service creation. The service repository is a central place where, e.g. the defined service chain can be stored. The service creation environment (SCE) publishes service interfaces to the service metadata store, and the service runtime environment (SRE) accepts the service requests from the users.

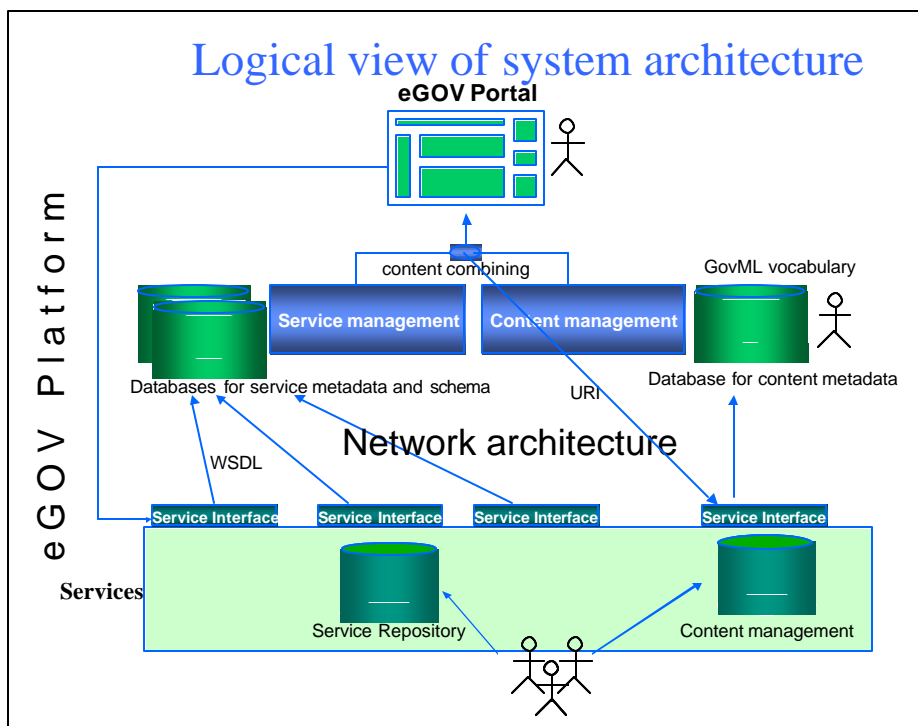


Figure 52 Logical view of the system architecture from the portal point of view

The architecture of the portal and the network architecture are based on the multi-tier approach where presentation, business logic, and data layer are separated. The portal can be handled as a separate application with its own multi-tier architecture and the network architecture on its own as well. The connection between these two environments uses Internet standards like HTTP, and metadata publishing will be based on the GovML that will be developed in the eGOV project.

The implementation will be carried out by using Java, J2EE standards, Web Services model, XML, and above all the RDF standard. XML signature and above all mobile security have very high priority.

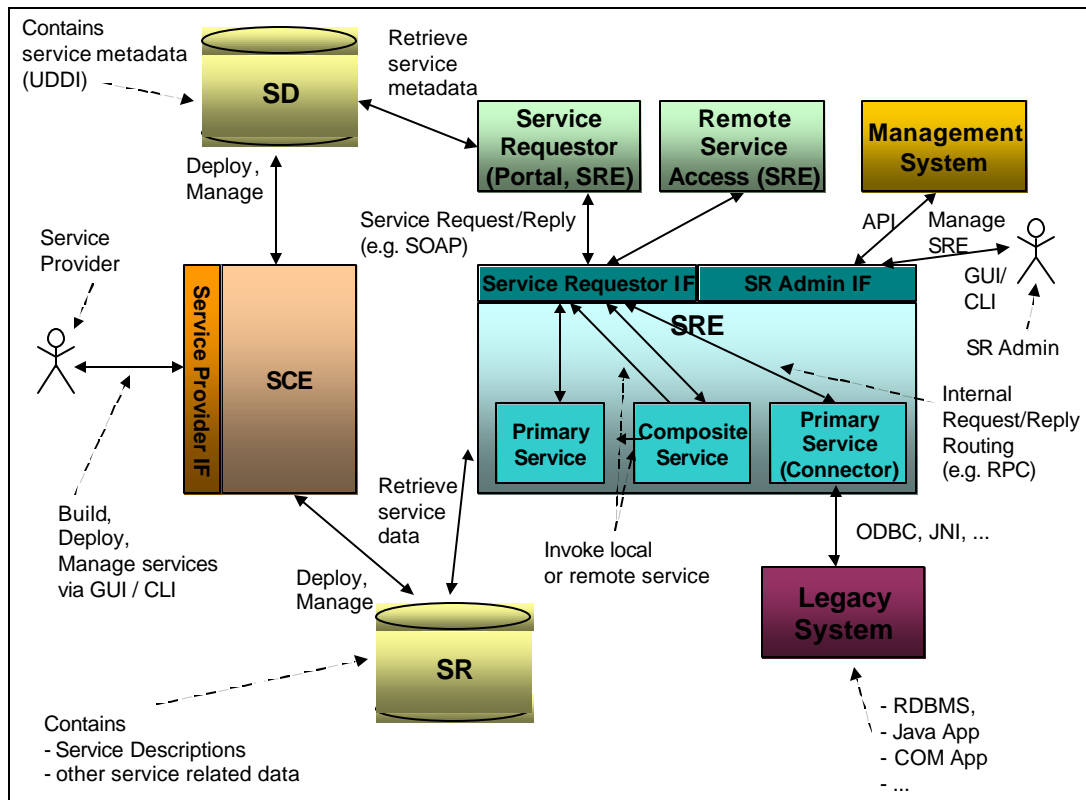


Figure 53 Overview of the proposed architecture for the SCE and SRE

The following diagram depicts the decomposition of the Service Creation Environment, Service Runtime Environment, Service Repository and Service Directory into four packages. The arrows in the diagram show the dependencies between the packages. A model based on UML is used for describing the logical structure of the system.

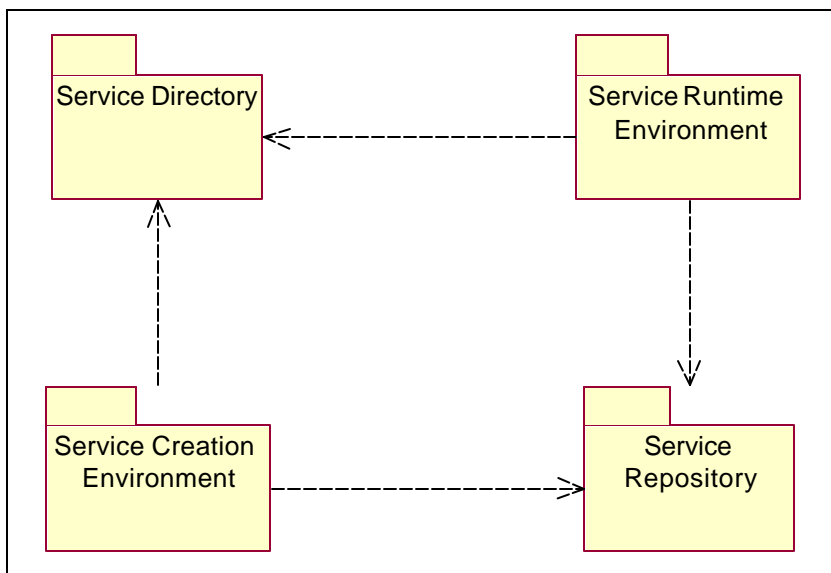


Figure 54 Decomposition into packages

The model contains the following packages:

Service Runtime Environment

This package contains the components for the Service Runtime Environment (SRE).

Service Creation Environment

This package contains the components for the Service Creation Environment (SCE).

Service Directory

This package contains the components for the Service Directory (SD).

Service Repository

This package contains the components for the Service Repository (SR).

4.2 GovML

The Governmental Markup Language (GovML) will be introduced as an XML vocabulary that will support the delivery of content and services to citizens (businesses) in terms of life-events (business episodes).

4.2.1 GovML within Content Directory

The GovML within the Content Directory will provide an abstract model of public sector content metadata. The use of the GovML will enhance the capability of the Content Directory with regard to the retrieval of public sector resources on the Web (e.g. html, word, and pdf files).

According to the eGOV architecture, there is one Content Directory instance located at the central authority and one Content Directory instance at each of the other participating Public Authorities (PAs). The central content directory is expected to host all content metadata while the content directory of each participating PA is expected to host the content metadata of this local PA only. However, the GovML syntax will be identical in all content directories.

The GovML will be invoked within the “Content Metadata Creation Environment”. More specifically, the administrator of the “Content Metadata Creation Environment” will insert metadata in the form of the GovML in order to describe the public sector content that resides in the content directory.

The GovML is expected to provide a small set of elements for common public sector content metadata descriptive terms and possibly some common attributes for further qualifying the meaning of the metadata. The use of the GovML for public sector content is intended to be analogue to the use of the Dublin Core for the library science community.

The realisation of the GovML will be based on the RDF specification, which provides a lightweight ontology system to support the exchange of knowledge on the Web. The RDF specification will be expressed in the GovML vocabulary in order to model metadata about public sector resources on the Web. The GovML vocabulary will be further elaborated in Deliverable D121, and it will be specified in more detail during the early stage of implementation.

From a more technical perspective, the GovML content descriptive vocabulary will be realised through RDF as a schema description. Documents containing information related to life events would be linked to Content Metadata Sets that will instantiate the RDF schema (GovML vocabulary). Metadata Sets will be stored in the Content Directory.

GovML vocabulary will provide the content descriptors with concern to the life-event metaphor. Content descriptors may contain:

- Title of the document,
- URI of the document,
- The node where the document is located,
- Type of the document,

- Name of the life-event(s) that the document is associated with,
- Language of the document,
- Keywords,
- Content beneficiaries (citizen categories)

etc

GovML vocabulary will be specified in detail during the first steps of implementation.

4.2.2 GovML within Service Directory

All eGOV services will be characterised in an identical way in order to facilitate their retrieval from the service repository as well as their execution in the service runtime environment. The vocabulary of service attributes is regarded as part of the GovML role inside the eGOV project. Thus, this service vocabulary will be defined and described in terms of GovML specification.

According to the eGOV architecture, there is one Service Directory instance located at the central authority and one Service Directory instance at each of the other participating PAs. The central service directory is expected to host all metadata of the services while the service directory of each participating local PA is expected to host only the metadata of the services that the particular PA offers. However, the GovML syntax will be identical in all service directories.

The GovML will be invoked within the “Service Creation Environment”. More specifically, the administrator of the “Service Creation Environment” will insert metadata in the form of GovML in order to describe the public services that reside in the service directory.

Service descriptors may contain:

- Service title,
- Service description,
- URI for the execution of the service,
- Responsible organisation(PA, ministry),
- Contact Person,
- Input parameters for the execution of the service, possibly:
 - Citizen name,
 - Citizen residence information,
 - Charging details e.g. credit card information,
 - Application form,
 - etc
- Output parameters from the execution of the service, possibly:
 - Application approval status,
 - Certificate,

- etc
- etc

In case of composite eGOV services, the input will be provided as a merger of inputs of elementary eGOV services comprising the composite eGOV service although in some cases the input for a elementary eGOV service will be produced and retrieved dynamically.

From the implementation perspective, the Service Creation Environment will mainly access the service vocabulary during the creation of a new service. Provided that the creation of a new service has been performed, the service “signature” will be published to the Service Directory by means of WSDL and UDDI description.

4.3 Portal

The eGOV portal will be based on an existing portal server framework. A portal server product normally includes tools for multi-channelling and personalisation. Multi-channelling refers to supporting several different access devices, such as mobile phones and PDAs as well as normal web browsers. Many portal servers have adopted the portlet model for their application architecture. Portlets typically represent one data source or application. In this project, one portlet can represent a life event in which the content and transaction services reside side by side. The user can personalise his/her workspace by choosing the portlets he/she wants to be included. The portal can also offer predefined profiles to the user.

The presentation layer gets XML input from the business logic layer. The XML message is translated to a device-dependent format by using XSLT scripts. Parts of the main page can be produced as a batch job for performance reasons (life-event administration).

The purpose of the business logic layer is to get data from the data layer (service management and content management) and content from the content store. When the user has found a topic he/she is interested in from the content metadata and wants to get the whole original content, the business logic layer retrieves the content on behalf of the user and offers it to the presentation layer as XML, if possible. Other business logic duties are queries from the data layer and content combining.

When a user wants to use interactive services, the business logic layer asks the service details of service management. Service details consist of the name of the service provider and service and the technical details on how to communicate with the service. In addition, service management also offers an XML schema for the services. The business logic layer combines this information with the XML message and forwards it to the presentation layer. The presentation layer generates the user output from the given information and forwards the user input to the actual service interface.

If authentication is needed, the business logic layer authenticates the user against the LDAP directory or validates the user certificate against the revocation list maintained by the certificate authorities, checks the signature and expiration date of the certificate. Authentication could be implemented as a separate component so that it will be available in other environments/portals.

Databases are relational databases and their data schemas are based on the UDDI standard and GovML vocabularies.

4.3.1 Service Management

The portal collects information on services to the service directory that is UDDI-based (www.uddi.org). The services have to implement the XML-based service interface and publish it in the service directory by using WSDL (Web Service Description Language). The portal service management takes the service description and saves (publishes) it in the service directory. Service management also implements a query interface that the portal can use for finding services and details of services. Service management also offers a schema repository for detailed information on service interfaces. The service directory can be file-based or based on a SQL database.

Service management also provides a schema repository where the services can publish their XML Schemas.

4.3.2 Content management

Content management takes care of the content metadata. The content repository is based on the RDF standard and it needs a GovML vocabulary to work with. Content management offers a GovML filter for accepting metadata. Metadata contains information based on the GovML vocabulary. The archiver saves the incoming metadata in the metadata repository that can be, e.g. Oracle, DB2, or SqlServer.

Content management also offers two query interfaces, one for interactive queries and one for persistent queries. Persistent queries are used to generate the static pages of the portal. Interactive queries are used to fulfil the detailed queries on a certain subject.

4.4 Service Runtime Environment

Figure 55 shows the conceptual main components of the Service Runtime Environment. Note that the Service Directory Interface and Service Repository Interface are not contained in this package. However, the SRE uses these interfaces for communication with the Service Directory and Service Repository.

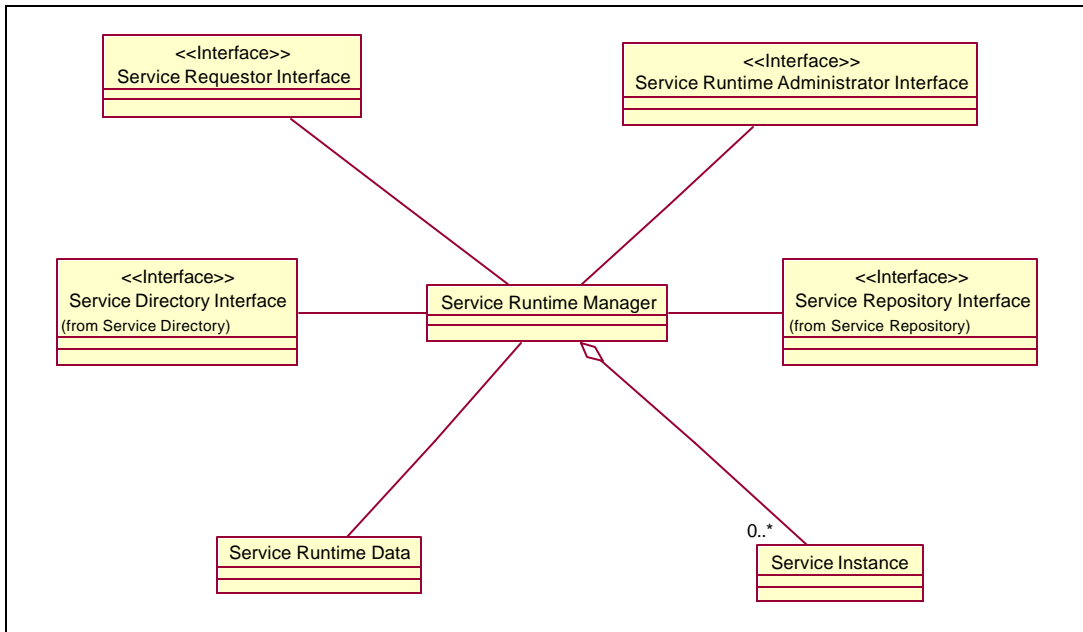


Figure 55 Conceptual main classes of the SRE

Figure 56 shows the mapping of this architecture to the traditional three-tier architecture.

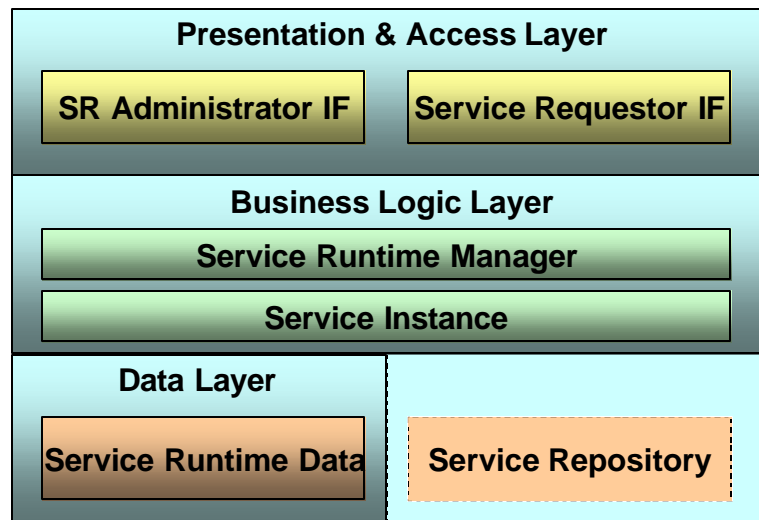


Figure 56 Three-tier architecture of the SRE

The following chapters give a more detailed description of each of the components shown in the figures above.

4.4.1 Service Runtime Manager

The Service Runtime Manager is the central execution component of the SRE containing the business logic of the SRE. It basically controls the hosting and execution of services.

The main tasks of the Service Runtime Manager are:

- creating and hosting the Service Instances either at system start-up or on demand (the data required have to be retrieved from the Service Repository via the Service Repository Interface),
- processing service requests received via the Service Requestor Interface,
- routing the processed request to the appropriate service implementation (Service Instance),
- initiating the execution of the service implementation (Service Instance),
- in case of composite eGOV services, invoking the services that are contained in the composite eGOV service, and
- returning the result of the service execution via the Service Requestor Interface.

When invoking a service during the execution of a composite eGOV service, it should be distinguished if the requested service is hosted by the local SRE or by some other SRE. The first case could be implemented by routing the request to the local service via internal (optimised) interfaces. The second case has to be implemented by routing the request via the Service Requestor Interface to the remote SRE.

4.4.2 Service Runtime Data

The Service Runtime Data represent all data required by the Service Runtime Environment that are not service-related, e.g. configuration data.

These data might be stored in a file system, relational database, etc.

4.4.3 Service Instance

The Service Instance represents the runtime instance of a service hosted by the SRE. It is created by the Service Runtime Manager either at system start-up or on demand, e.g. when a new service is deployed. In order to create the Service Instance, the Service Runtime Manager must load the required data from the Service Repository via the Service Repository Interface.

4.5 Service Creation Environment

The following figure shows the conceptual main components of the Service Creation Environment. Note that the Service Directory Interface and the Service Repository Interface are not contained in this package. However, the SCE uses these interfaces for communication with the Service Directory and Service Repository.

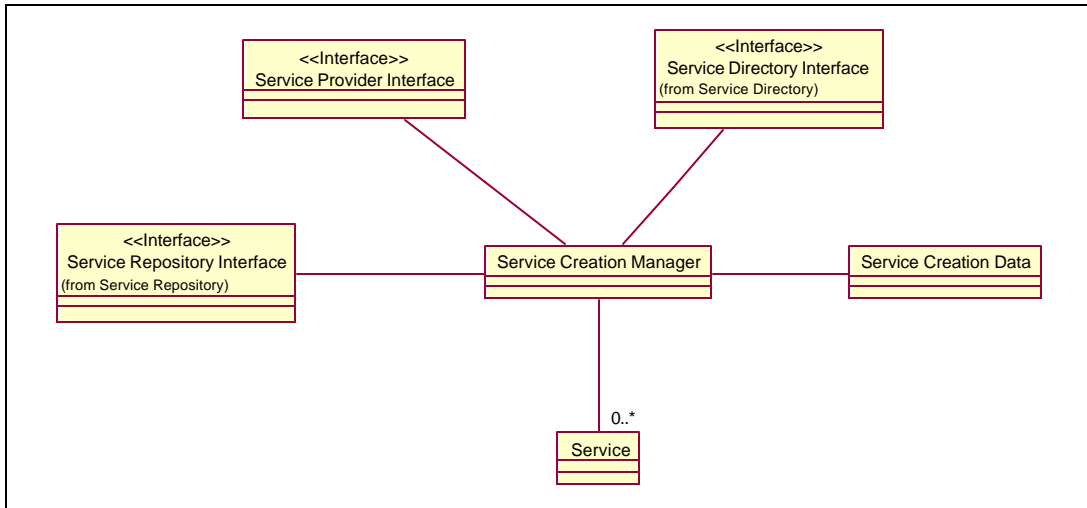


Figure 57 Conceptual main classes of the SCE

Figure 58 shows the mapping of this architecture to the traditional three-tier architecture.

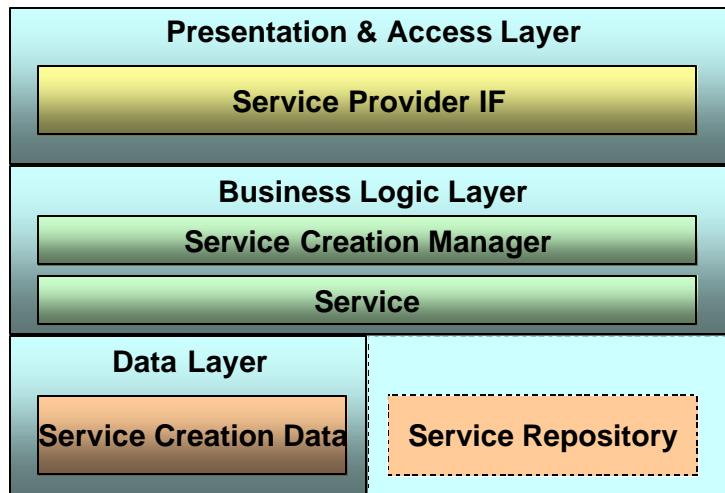


Figure 58 Three-tier architecture of the SCE

The following chapters give a more detailed description of each of the components shown in the figures above.

4.5.1 Service Creation Manager

The Service Creation Manager represents the business logic of the Service Creation Environment.

4.5.2 Service Creation Data

Service Creation Data represent all data required by the Service Creation Environment that are not service-related, e.g. configuration data.

These data might be stored in a file system, relational database, etc.

4.5.3 Service

The Service-entry represents a service in the Service Creation Environment. It basically consists of two parts: Service Description and Service Realisation:

Service Description contains all data that are required by a Service Requestor for binding to a service and invoking this service.

Service Realisation contains all data that are required by the Service Runtime Environment for hosting and executing a specific service.

A service can be implemented either as an **elementary eGOV service**, i.e. a service that does not invoke other services, or a **composite eGOV service**, i.e. a service that invokes one or more services according to a specific execution flow.

Furthermore, the functionality of legacy systems, such as RDBMS systems, or any other system offering APIs, can be integrated into the eGOV service framework by implementing a service (“Connector”) that integrates the desired functionality by using the APIs offered by the legacy system.

The following figure gives an overview of the structure of a Service.

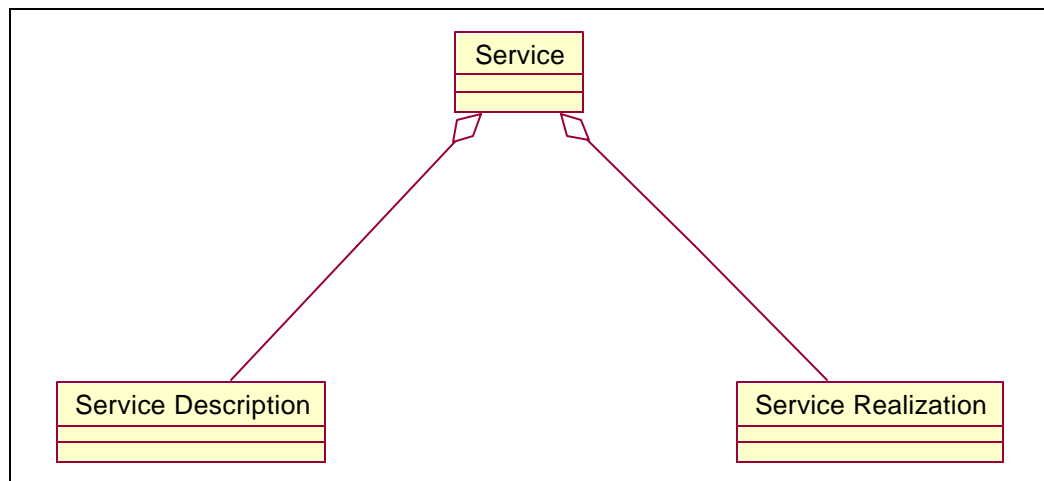


Figure 59 Main components of a service

4.5.3.1 Service Description

A Service Description contains all data that are required by a Service Requestor for binding to a service and invoking this service.

These data are stored to and retrieved from the Service Repository via the Service Repository Interface.

The data contained in the Service Description can be divided into an abstract, reusable part ("Service Interface") describing the operations supported by a service, and a concrete part ("Service Implementation") describing concrete protocol and data format bindings as well as the network address of a specific service ("Service Instance").

4.5.3.2 Service Realisation

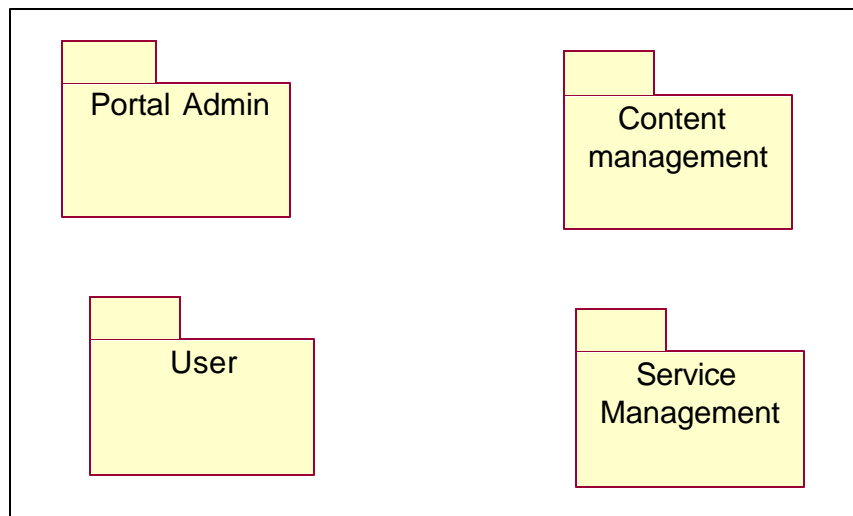
Service Realisation contains all data that are required for describing the implementation of elementary as well as composite eGOV services.

These data are stored to and retrieved from the Service Repository via the Service Repository Interface.

4.6 Use Cases

4.6.1 Portal use cases

The portal contains four use case packages.



Use cases are divided into administration packages and user packages. Administration packages are Portal admin, content management and service management use case packages. The user package contains use cases for the citizen.

See a detailed description of the Portal use cases and user roles in Appendix 1.

4.6.2 Network Architecture Use Cases

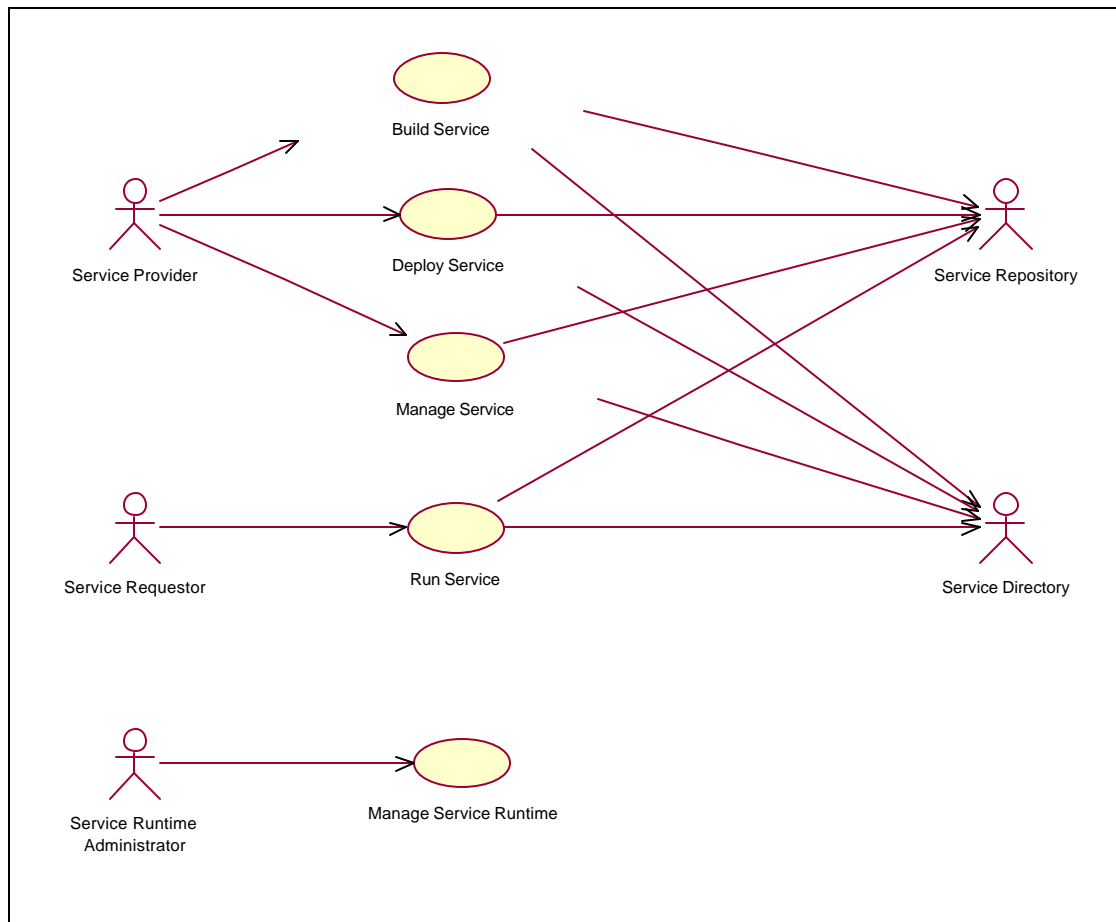


Figure 60 Use Cases and Actors

The Use Case view contains the four main use cases that make up the lifecycle of the services. Furthermore, it contains one use case for managing the Service Runtime Environment.

The model contains the following **Actors** :

Service Provider

The Service Provider is an entity (person, organisation) that is responsible for building, deploying, and managing services. This entity is usually part of the central or any other public authority.

Service Requestor

The Service Requestor is an entity that requests a service. The Service Requestor can be the eGOV Portal or any other service or application that wants to use a service. When executing composite eGOV services, the SRE can also act as Service Requestor. It is not an actor in the sense that it is outside the eGOV system, but it is defined as an actor in order to make UML modelling easier (“internal actor”).

Service Runtime Administrator

The Service Runtime Administrator is a person or management system that performs management tasks for the Service Runtime Environment.

Service Directory

The Service Directory holds all information required for publishing, finding, and invoking services in the eGOV network.

It is not an actor in the sense that it is outside the whole eGOV system, but it is defined as an actor in order to make UML modelling easier (“internal actor”).

Service Repository

The Service Repository holds all information required for describing and executing services.

It is not an actor in the sense that it is outside the whole eGOV system, but it is defined as an actor in order to make UML modelling easier (“internal actor”).

The model contains the following **Use Cases**:

Build Service

The Build Service use case is initiated by the Service Provider. It includes the development and testing of new services as well as locating existing services and retrieving their Service Descriptions in cases where the new service is composed of existing services.

Deploy Service

The Deploy Service use case is initiated by the Service Provider. It includes publishing the service in the Service Directory and deploying the service descriptions and any other SRE-specific deployment data in the Service Repository.

Manage Service

The Manage Service use case is initiated by the Service Provider. It includes ongoing management and administration of the services.

Run Service

The Run Service use case is initiated by the Service Requestor. The Service Requestor may use static or dynamic binding to the service at runtime. In the first case, all information required for service invocation, including the network address of the service, is known by the Service Requestor when invoking the service. In the second case, this information – or at least parts of this information, e.g. the network address of the service - is not known by the Service Requestor when invoking the service, and therefore needs to be requested from the Service Directory.

Depending on whether the Service Requestor uses static or dynamic binding of the service, this use case may include locating the requested service in the eGOV network via the Service Directory and invoking the service.

Manage Service Runtime

The Manage Service Runtime use case covers the execution of management tasks for the Service Runtime Environment that are not service-related, such as tasks related to fault and configuration management.

Furthermore, it includes the reception and processing of notifications (alarms) emitted by the Service Runtime Environment.

4.7 Internal and external connections

4.7.1 Connections to service metadata (Portal)

An essential question is how to find the services you need and how to make your own services accessible to others. A basic component of such an environment is a **service directory**, which acts as a central repository where businesses and organisations can register descriptions of themselves and the services they offer. The descriptions can then be searched through a standard interface.

Service directories have been developed to support client programs, e.g. portals in finding businesses and their services and invoking the services regardless of their physical location or application/component architecture. The UDDI (Universal Description, Discovery and Integration) specification is a specification for distributed Web-based information registries of web services.

4.7.2 Connections to content metadata

Content metadata provides a way to describe pieces of content in a machine-understandable way. Metadata is completely independent of the types of content it describes, i.e. one can as easily describe life event information as financial information. Metadata is the basic building block for bringing intelligence to portal search and information representation.

By using content metadata it is quite simple to collect suitable content to life events. Contents have to be categorised in a standard way so that it is possible to make queries and combine content in order to create life events. Content metadata will provide two types of query interfaces, one for interactive queries and another for persistent queries. Interactive queries are used for dynamic page creation and persistent queries are used for creating static pages like categories of life-events. Persistent queries can also be used for sending interesting information to another portal or citizen.

Content management will contain adapters that can translate the metadata messages to the GovML format. Messages that already fulfil the GovML standard can be updated without modification to the content metadata database. All content metadata has to go through the XML Schema validation before it can be stored in the database.

5 Technical architecture/Portal

5.1 General

The Portal architecture is a multi-layer architecture. The body of the architecture will contain a browser/pervasive device, web server, application server and database server. The architecture can also contain other layers that will be defined in a later phase. The basic recommendation is to keep the presentation and data layers separate from other layers. The presentation layer will offer multi-channel support and support for notification as well. The duty of notification is to inform a user of the event or action she/he is interested in.

5.2 Data communication and platform architecture

5.2.1 Data communication connections

The communication architecture has to be based on open standards. The main principle of network security is to prevent the message from changing its form during the transmission and to maintain data integrity. The main interface in the Internet transmission is the SSL (security socket layer). The information with high security demand needs to be protected by using the SSL.

If Wireless Application Protocol (WAP) functionality will be implemented, Wireless Transport Layer Security (WTLS) will be used in order to ensure sufficient data integrity and privacy protection.

The service directory will accept only Web Service Description Language (WSDL) formatted service descriptions. If the service cannot support this format, portaladmin can add the service to the service metadata directory manually. The service directory will be implemented to support the Universal Description Discovery Interface (UDDI) standard.

The content metadata repository will support a vocabulary based on the Resource Description Framework (RDF). The vocabulary will be implemented according to the GovML standard, and it utilises the Dublin Core standard.

5.2.2 Workstation and mobile device requirements

Workstations:

NT, Windows 95, Windows 98, Windows 2000, Mac

The minimum resolution demand is 800 x 600

PDA and Mobile devices: (a proposal, the number will be limited)

PDA: Palm VIIx, Palm m505, Psion Series 7, Psion netBook, HP Jornada 700 series, Compaq iPAQ

Resolution demand (160x160, 240x320, 640x240, 640x480)

Mobile: Nokia Communicator 9210, Nokia 6210, Ericsson 380s, Ericsson T29, Siemens S35, Siemens SL45

Resolution demand (96x60, 101x80, 310x100, 640x200)

Browser versions:

Netscape and MS Internet Explorer from version 4.0 and above will be supported. The text-based version will be supported more widely. Browsers in PDA and Mobile devices are so diverse that only the standards (HTML 3.2 and WML 1.1) will be supported.

5.2.3 Server descriptions and requirements

The server requirements are directly derived from the demonstration portal site needs. If 24-hour usability is not a definite demand, one physical machine will be sufficient for the portal environment per demonstration site. For security reasons the server should be located between firewalls, and all unnecessary communication ports should be closed.

The server itself has to be equipped with a memory and hard disk capabilities that support the run of the portal. If development is carried out by using platform-independent tools like Java, the server hardware could be Windows, Unix, or Linux compatible.

5.3 Utility programs

The Adobe acrobat reader is one of the necessary utility programs. Another utility program may be a smart card reader and software to support it.

5.4 Development environment

Development will be carried out by using the Java programming language and a Java application server that supports the J2EE standard. The portal server product will be chosen to support the underlying technology and help the implementation of the desired portal features.

6 Portal application architecture

6.1 General

The eGOV Portal will contain three different components: the portal, service management, and content management. The portal will be built on top of the portal server framework, content management will use an existing metadata management system, and service management will be based on standard web service solutions.

The portal contains two databases: one for the service metadata and data schemas and another for the content metadata. Service metadata is based on the UDDI standard and it exploits an existing framework. The UDDI is a new and developing standard and the solutions are still product-specific. The first version of Java 2 Enterprise Edition that will include built-in support for Web services, based on SOAP, XML and WSDL, will be J2EE 1.4, expected in late 2002 or early 2003.

There are also several content metadata based solutions, but they do not rely on standards like RDF. The content metadata contains information about information, the core of which is based on Dublin Core standard. The GovML will expand it (if necessary), but it definitely has to describe the rules on the kind of information the metadata will contain. One extremely important issue in the GovML is the categorisation of life-events. The portal takes advantage of these two databases and combines the content and service metadata from both databases with federated searches according to user needs.

6.2 Portal features

One of the interesting features of a portal is **personalisation**. It has even been said that it is personalisation that makes a portal. The eGOV portal could offer predefined profiles as a personalisation feature. Dynamic personalisation is one of the features to be investigated. In dynamic personalisation the user does not have to choose a certain service or content in order to personalise his/her workspace. Personalisation will be carried out by using recommendations of other users or according to the user's earlier behaviour.

Another important feature of portals is the **aggregation** of the content and services. The eGOV portal will aggregate both content metadata and service metadata. This approach gives users a uniform starting point for finding and accessing the needed information and services. To complete this feature, the portal needs external content integration. According to the chosen content metadata, the original (actual) content is retrieved on behalf of the user. If the content is structural it will be modified to the eGOV portal layout.

The **search** feature helps users find exactly the information they want. Instead of a full-text-search, the eGOV portal offers an exact search from the metadata information. The same search combines information retrieved from both content and service metadata in one user transaction.

The content and services are categorised according to **life-events**. Each life-event contains basic information regarding a certain life episode. It also has links to applicable information in content and service metadatabases.

A new interesting feature of a portal is the **notification** facility. The user is informed of the information he/she is interested in. The user can make agents or stored search to the portal and immediately when the saved rule is fulfilled the user gets response to his/her e-mail or mobile phone.

The eGOV system will include versatile **administration tools** for the management of the portal. The tools offer the management of profiles, life-events, content, and service metadata. Due to the portal's demonstration nature and further development needs, the eGOV-portal will be built by using open APIs. It will offer a smooth further development route to a full-scale portal platform.

Support for wireless devices is one of the features that current eGovernment portals do not offer yet. Therefore, **wireless support** is one of the investigation targets of the project. It will cover both SMS (in relation to push services) and WAP technologies. This is also one interesting demonstration feature.

With a proper **security** level and user **authentication** the eGOV portal can live up to the expectations of the users. Although both wireless security and user authentication are subject to a lot of hype and debate, the eGOV portal aims to demonstrate their use. Digital signature is an addition to the palette of security features. Digital signatures will also be investigated to the extent the infrastructure is mature enough.

6.3 System operation at common level

The operation of the system has been portrayed in Figure 61 below and can be described as follows:

- the citizen opens the main page of the portal.
- the portal has both persistent parts of the main page and dynamic parts that look for the content from the content metadata.
- the page is generated to the citizen.
- the citizen chooses a life event (e.g. birth of a child) and wants more information about a certain topic.
- the portal picks up the article from the actual content, which can be some kind of a content management data store.
- the portal also tries to find a service according to the content categorisation chosen by citizen.
- the result is the actual content and a link to the service.

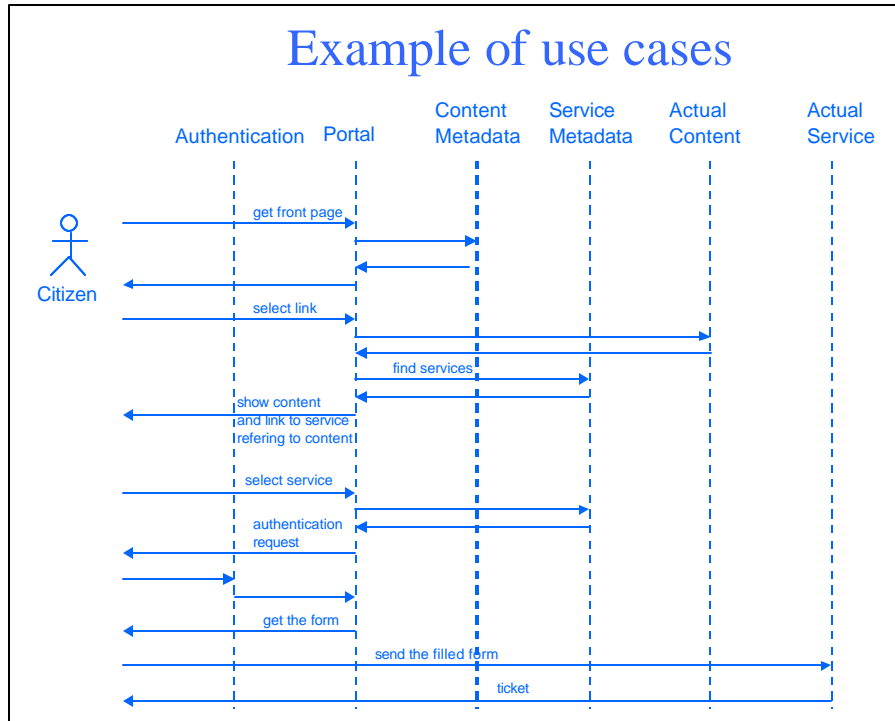


Figure 61 System operation at common level

If a citizen wants to use the service, the service request will be transmitted to the portal. The portal will find information on how to invoke the service from the service metadata. According to the service invocation information and service schema, the portal can generate a form to the citizen. If the service needs authentication the citizen is redirected to the authentication service and after successful authentication the citizen gets a form to fill in.

The filled form will be sent to the actual service and the actual service will send a receipt to the citizen or, in case of a simple transaction, the citizen can get an immediate response.

6.4 Subsystems

6.4.1 Service management

The service creation environment will publish service interfaces to the service manager. The service manager accepts web service description language (WSDL) based messages and XML schema messages. The publisher takes the messages and stores interfaces to the service directory and schemas to the schema repository.

The service manager also provides a query interface to the service directory. The query interface is based on an UDDI specification.

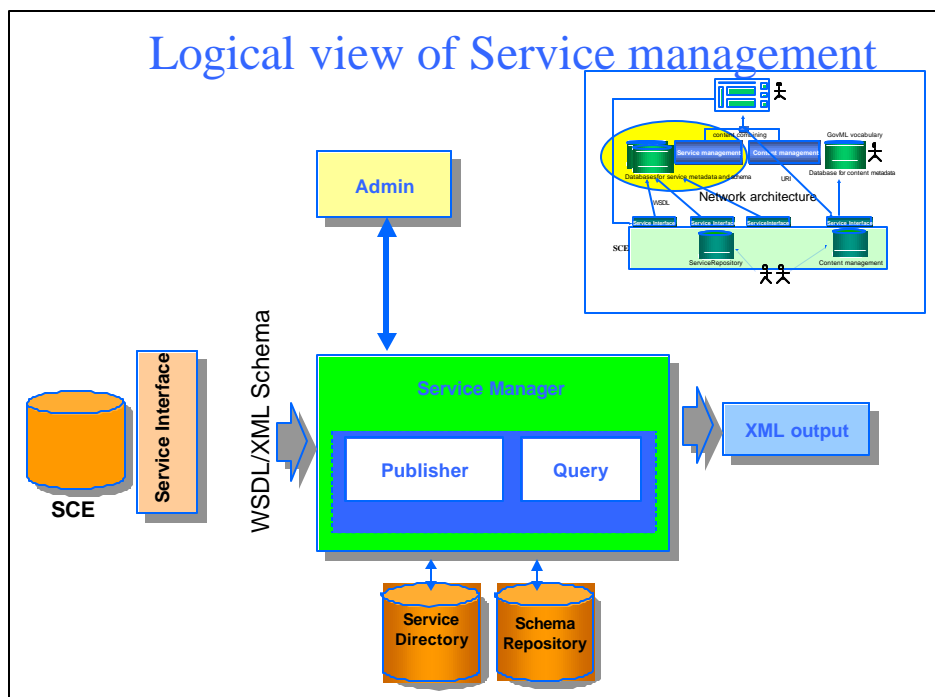


Figure 62 Service Management

6.4.2 Content management

The content manager will accept metadata published by the content database. If the published metadata is not GovML formatted, the GovML adapter will transform and offer it to the Archiver. The Archiver stores the content metadata to the metadata data store.

The content manager provides two query interfaces to the content metadata, one for interactive queries and another one for persistent queries. Interactive queries are used for the portal for dynamic pages and persistent queries could be used for pushing information to the citizens. The query output is an XML message that is formatted for the users with simple XSL transformation.

The admin interface is provided to the manager of the portal and partly to other third parties who want to publish their metadata in the portal. The use of admin interface content can be monitored and metadata can be maintained. The admin can also generate persistent queries for generating static pages for life events.

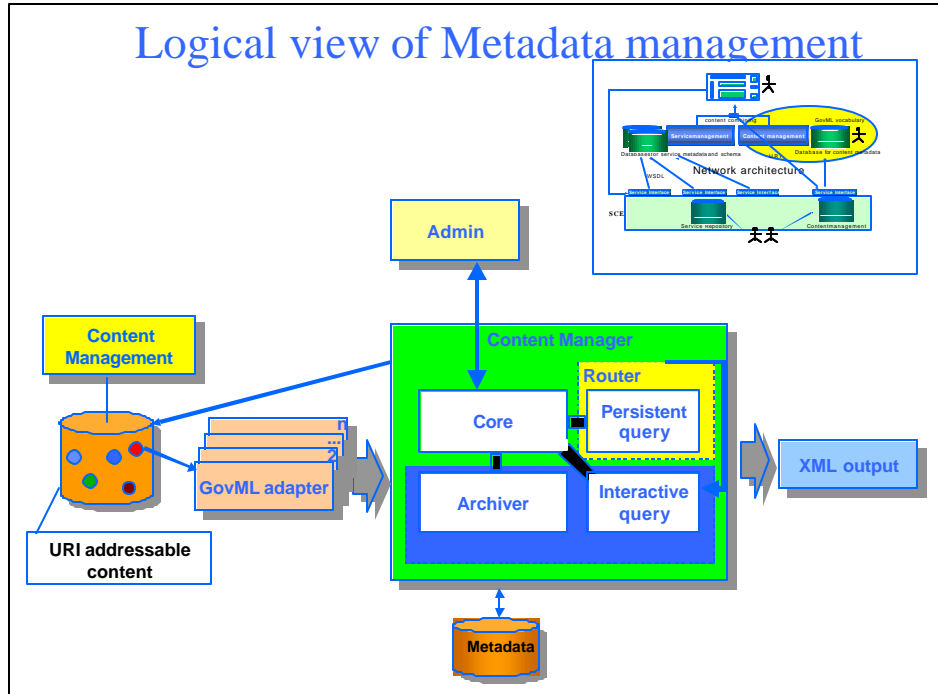


Figure 63 Metadata Management

6.4.3 Portal

The portal makes queries from the content and services, combines and shows them to the citizen. Some of the portlets represent more static information (updated periodically) like categories of the life event. Other portlets are provided for specific life events. One portlet represents one life event with content metadata and links to services. A specific search portlet is provided for performing active queries from the content metadata and service metadata directories.

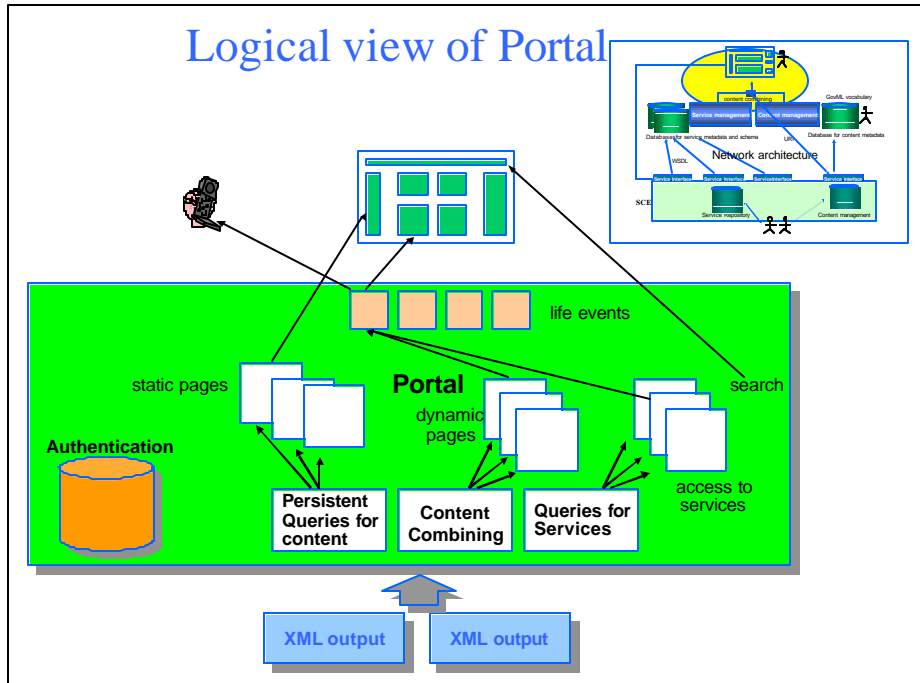


Figure 64 Logical view of the Portal

6.5 Connections to other systems

6.5.1 Connections to internal systems

The internal systems are the portal, service metadata management, content metadata management, and authentication. The connection between these systems is based on close integration. Connections are built by using the Java programming language, and they use Java's build-in communication methods like RMI.

The data flows between these systems are XML-based as far as possible. The results of queries from the content and service metadata directories are XML formatted and the descriptions of the life events are also based on XML.

6.5.2 Connections to external systems

External system connections are needed in the actual content retrieval. When the user has found the information he/she is interested in, the actual content will be retrieved from the source of the metadata. The actual content has to be pointed in a Universal Resource Identifier (URI). The supported URIs are standard Internet protocols like HTTP or FTP and in some cases links to the file system. A file system link could come in question with the portal's own content.

6.6 Shared systems

The authentication mechanism is the only shared system of the portal. The portal redirects the citizen to the authentication service. The authentication component passes the token back to the portal. The portal can then verify that authentication has been performed and pick up some information about the user, such as surname, given name, address, etc. The user identity is also transferred to the actual service. The component can also ask the user to authenticate or just verify the authentication done in the portal. The service authentication request could take place when the citizen has not yet been authenticated at the portal but wishes to use a service that needs authentication. This could be the case when a user wants to know the status of his/her transaction or receive information on a decision.

Authentication supports the username and password or certificate -based authentication. The usernames and passwords are stored in a LDAP directory. A connection to the certificate authority database for certificate validation is needed in order ensure that the certificate has not been revoked.

6.7 Description of user interface

6.7.1 Administration user interface

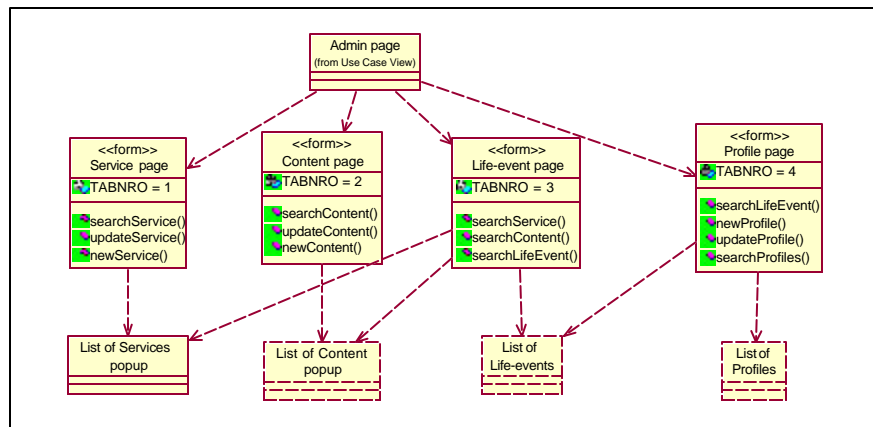


Figure 65 Admin user interface

The administration user interface will contain tools for the portal, content and service metadata management. The Portal admin can generate user profiles (e.g. student) and define some life-events and combine them. For life-event management the admin needs query interfaces to the service and content metadata databases. The detailed admin actions are described in the use cases.

6.7.2 Citizen user interface

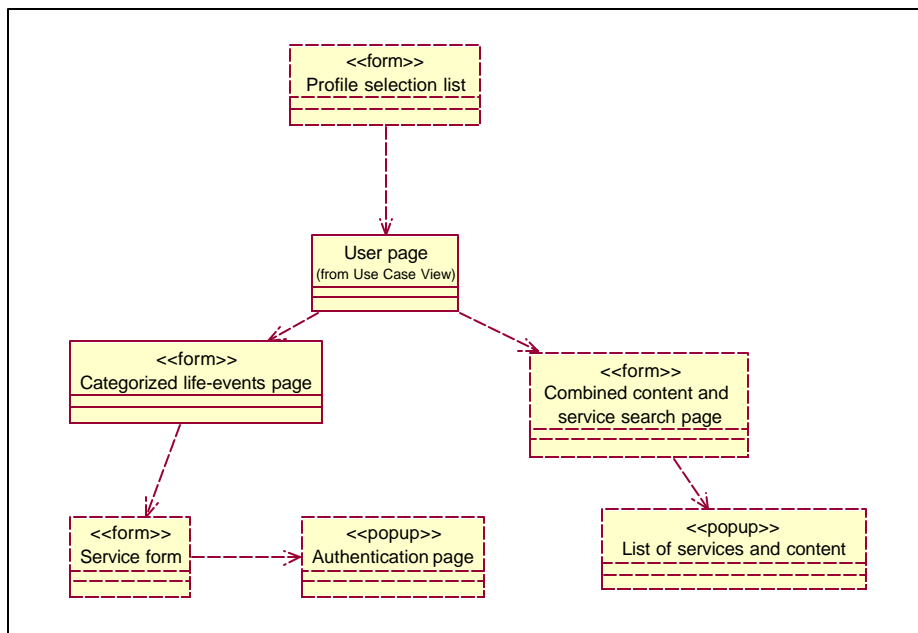


Figure 66 Citizen user interface

The user interface contains a profile page where the user can select a profile applying to his/her needs. The user can also go directly to a common user page that shows all life event categories. On the user page, there is a list of life event portlets and a search portlet. When the user selects a life event, he/she gets a detailed list of information about the content and services. When the citizen selects a service link, he/she could get an authentication page before getting the service form to fill in. When the user selects a content link, the actual content will be retrieved as well as the services that belong to that content. See the details in the use case descriptions.

6.8 Business Logic level

The business logic offers query interfaces to the databases and combines information to life events. The business logic provides interfaces to the presentation layer, services and content metadata to be published. This layer takes care of the given content information and transforms it to the GovML format and stores it in the database. The validation of messages coming through the service interface is also one task executed by the business logic. The business logic implements the UDDI and RDF standards and defines the query language to the content metadata. Saving the queries is also a task of this layer.

When the user needs the actual content, the business logic layer makes the query from the actual content data store and transforms the content to XML and offers it to the presentation layer for further modification.

6.9 Services

6.9.1 Event handling

The portal's event handling is managed by the application server. The database transactions are monitored and managed by the EJB container. The EJB components take full advantage of the runtime environment and leave the transaction handling to it.

6.9.2 Batch jobs

The system will contain a couple of batch jobs. The batch jobs are intended for generating the persistent pages from the content metadata and the saved queries by the users. The persistent pages are generated once a day but the saved queries are run more frequently.

6.10 Database

The portal will contain two main databases, one for the content metadata and another for the service metadata. Assistance databases are the log database, user registration and authentication database, and the portal's own database. The portal's own database is used for the profile, life-event and saved search storing.

6.11 Common components

- A service and content component for finding services and content from the databases.
- A fetch component for retrieving the actual content from the site where the URI has been declared.
- An authentication component for user authentication.

6.12 Error handling

A centralised error handling mechanism will be developed. The errors are registered in the log database and the critical errors are propagated to the system administrator.

7 Network Architecture

7.1 General

This chapter discusses a solution approach to the network architecture and its functionality based on the SOAP/UDDI/WSDL framework. Note that it is still necessary to evaluate alternative or complementary technologies, such as ebXML or IBM's WSFL.

SOAP lets an application invoke a remote procedure call (RPC) on another application or pass an object to a remote location by using XML messages and the Internet. It is designed to let organisations publish data and services over the Web as easily as they can publish HTML pages. As such, it functions as a wire protocol that connects multiple service providers and requestors, each of which might use facilities such as an information server or object broker in order to integrate and process the data exchanged via SOAP.

While SOAP 1.0 only used HTTP, SOAP 1.1 can use HTTP, FTP, SMTP and POP3 for transporting SOAP documents, and it also supports the HTTP Extension Framework. FTP files can package SOAP calls, but FTP servers have limited ability to act on incoming file transfers.

To maximise flexibility and scalability, SOAP is loosely coupled to the transport protocol as well as to the programming or component models internally used by Service Requestors or Service Providers, such as Microsoft's COM, Java's Remote Method Protocol (RMP) and CORBA.

UDDI, introduced in mid-2000 by Microsoft, Ariba and IBM, is a framework for automatically handling B2B transactions, electronic commerce, and Web services. The framework – consisting of the SOAP messaging scheme and APIs for working with Web services – lets organisations describe themselves and their product offerings, explain how they wish to conduct business over the Internet and search for compatible partners or customers. This information is published in a UDDI registry.

WSDL, introduced in October 2000 by the three UDDI creators, is an XML vocabulary that standardises the description of Web services. It describes Web services as collections of endpoints that exchange information about each others' capabilities.

SOAP, UDDI and WSDL together comprise a technology platform for implementing and accessing Web services.

The **benefits** offered by this Web services architecture are:

- SOAP has been built on existing, commonly available technologies. It supports HTTP, SMTP and other protocols over the wire. It uses the well known RPC message paradigm and marshals data into XML text documents. SOAP also lets documents pass through firewalls and is compatible with existing security standards like Kerberos and SSL.
- SOAP works with any programming or scripting language, any object model, any chipset and any Internet wire protocol. While the three most important application architectures – CORBA, COM and Java – can all send messages and RPCs over the

Internet, they are complex and require a considerable infrastructure investment. Also, both sender and receiver must utilise the same application model, or they must utilise techniques to bridge between different application models. SOAP is loosely coupled with the underlying application architecture so that processing can take place even if, for example, one partner uses COM and the other partner uses CORBA or Java.

- Since SOAP uses standard Internet protocols such as HTTP, it easily passes through firewalls unless specifically blocked. Distributed object protocols do not pass through firewalls without special configurations.

The **drawbacks** of this architecture are:

- SOAP's worst handicap may be its performance, both over the wire and on the nodes processing SOAP requests, since it is based on the exchange of XML text documents. XML documents are very verbose compared with a machine-readable code. As a result, SOAP processing is slower than standard inter-application message processing. This could cause considerable performance problems in large systems or under heavy load conditions.
- SOAP does not handle some of the more complex aspects of inter-application messaging. It does not support complicated RPCs or synchronous bi-directional communication. Neither does SOAP provide reliable communication, i.e. automatically sending a message until notified of the receipt.
- Since SOAP is not bi-directional, its transaction handling is also weak, and it cannot support synchronous transactions or two-phase commit. RFC 2731 (Transaction Internet Protocol) has facilities for bi-directional Internet transactions and two-phase commit, and it could be adapted to work with SOAP, if necessary.
- For the time being, SOAP does not include or specify security mechanisms.

7.2 Service Runtime Environment

When building the Service Runtime Environment (SRE) on top of the SOAP/UDDI/WSDL framework, the implementation strategy could be to choose an application server available on the market that supports this framework, e.g. IBM WebSphere or BEA WebLogic, and to implement the SRE based on the evaluated products.

When using SOAP as the connecting glue between the Service Requestor and the entities hosting and executing the services (SRE), the SRE must support a SOAP message exchange mechanism as described in the following. Note that a SRE entity also acts as Service Requestor if it executes composite eGOV services.

A requestor application (Service Requestor) sends data to a server or smart proxy. This smart proxy uses an internal RPC mechanism, which may support COM, CORBA or Java APIs, for calling an XML parser. The parser marshals RPC information into an XML text document. The proxy sends the document through the requestor's firewall to the appropriate server or proxy (SRE). The SRE's proxy calls an XML parser and SOAP translator to unpack the message. After translation, the request is appropriately routed by using the SRE's internal RPC protocol, which can be the same or different from the one that the requestor uses. When the processing of the service request is finished, the result is sent back to the SRE's proxy, which packages it as an XML document and sends the

document across the Internet to the client's proxy. The proxy translates and unpacks the response and forwards it as appropriate.

The following figure illustrates the steps described above.

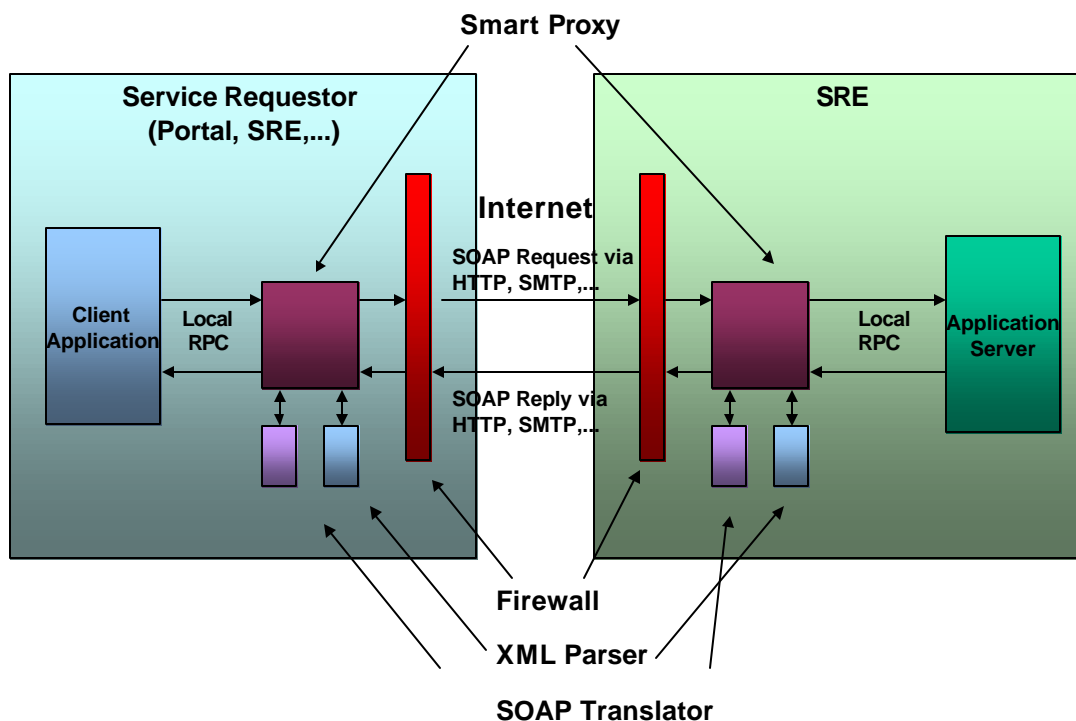


Figure 67 SOAP message exchange between Service Requestor and SRE

SOAP supports two message formats:

- RPCs, which may invoke objects or pass methods and parameters, and
- Self-describing XML messages for application integration.

SOAP defines three basic parts of a message:

- The **envelope** is the top element in the XML document, and it is required for every SOAP message. It identifies the message's content, the desired recipients, and any special processing information.
- The **header** lets applications exchange information even if they have no prior knowledge of each other. Headers may identify features in the message, explain whether a feature is optional or mandatory, provide processing information, or furnish additional protocols or tasks such as security or transaction management. A message may include zero, one, or multiple headers.
- The **message body** is mandatory. If there are no headers, it is the first element below the envelope. If one or more headers are present, it follows the last header. The body contains the XML information being exchanged and is formatted as a self-describing document or as an RPC call with methods and parameters. The body may also include a special element for reporting errors.

The following listings show fragments of an example request and reply message that includes all three parts described above:

POST /StockQuote HTTP/1.1

Host: www.getquote.com

Content-Type: text/xml; charset="utf-8"

Content-Length: nnnn

SOAPAction: "..."

```
<SOAP-ENV:Envelope
  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
  SOAP-ENV:encodingStyle=" http://schemas.xmlsoap.org/soap/encoding/" />
  <SOAP-ENV:Header>
    <t:Transaction xmlns:t="..."
      SOAP-ENV:mustUnderstand="1">
      5
    </t:Transaction>
  </ SOAP-ENV:Header>
  <SOAP-ENV:Body>
    <m:GetLastTradePrice xmlns:m="...">
      <symbol>DEF</symbol>
    </m: GetLastTradePrice>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

HTTP/1.1 200 OK

Content-Type: text/xml; charset="utf-8"

Content-Length: nnnn

```
<SOAP-ENV:Envelope
  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
  SOAP-ENV:encodingStyle=" http://schemas.xmlsoap.org/soap/encoding/" />
  <SOAP-ENV:Header>
    <t:Transaction xmlns:t="..."
      SOAP-ENV:mustUnderstand="1">
      5
    </t:Transaction>
  </ SOAP-ENV:Header>
  <SOAP-ENV:Body>
    <m:GetLastTradePriceResponse xmlns:m="...">
      <Price>34.5</Price>
    </m: GetLastTradePriceResponse>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

7.3 Service Creation Environment

The Service Creation Environment (SCE) must basically support the building, deployment, and management of services. If the SOAP/UDDI/WSDL framework will be utilised for realisation, access to the Service Directory will be implemented via UDDI APIs, and Service Descriptions will be realised by using XML. However, the utilisation of SOAP/UDDI/WSDL does not enforce any specific technology for the Service Realisations. These technologies will be determined according to this project's requirements as soon as possible.

When building the SCE on top of the SOAP/UDDI/WSDL framework, the implementation strategy could be to evaluate an IDE, such as IBM's XML and Web services DE. Another set of development tools available on the market that supports this framework could also be chosen. Then the SCE is implemented on top of the evaluated product.

WSDL defines an XML grammar for describing network services as a collection of endpoints or ports. The use of WSDL divides the Service Description into two parts: service interface and service implementation. This makes it possible to define each part separately and independently, and they can also be reused by other parts.

A service interface definition is an abstract and reusable service definition that can be instantiated and referenced by multiple service implementation definitions. This makes it possible to define and implement common industry-standard service types by multiple implementers. This is analogous to defining an abstract interface in a programming language and having multiple concrete implementations.

The service interface contains WSDL elements that comprise the reusable portion of the service description: **binding**, **portType**, **message** and **type** elements as depicted in Figure 68.

The Web services are defined in the **portType** element. The operations define what XML messages can appear in the input and output data flows.

The **message** element specifies the XML data types that constitute the various parts of the message, it is used to define the input and output parameters of an operation.

The use of complex data types within the message is described in the **types** element.

The **binding** element describes the protocol, data format and other attributes of a particular service interface (portType).

The service implementation definition is a WSDL document that describes how a particular service interface is implemented by a specific Service Provider.

A Web service is modelled as a **service** element. A service element contains a collection (usually one) of port elements.

A **port** associates an endpoint, e.g. a network address or URL, with a binding element from a service interface definition.

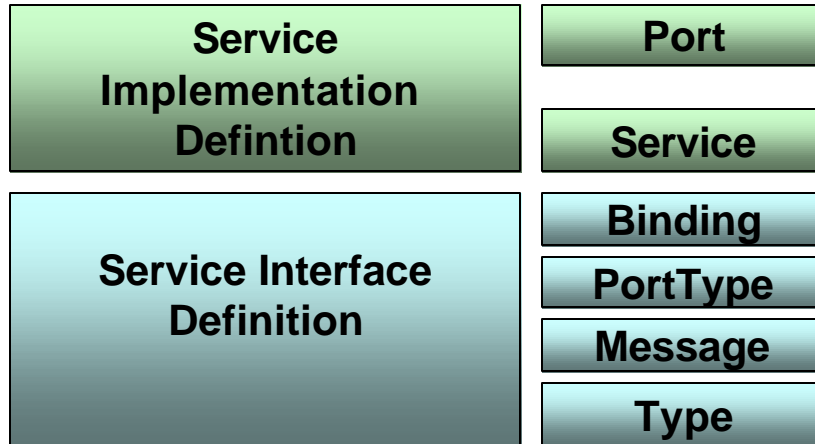


Figure 68 WSDL information model

The following listing shows an example for a WSDL service interface definition:

```
<?xml version="1.0" encoding="UTF-8" ?>
<definitions xmlns="http://schemas.xmlsoap.org/wsdl/"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:tns="http://www.getquote.com/StockQuoteService-interface"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
name="StockQuoteService-interface"
targetNamespace="http://www.getquote.com/StockQuoteService-interface">
  <message name="SymbolRequest">
    <part name="symbol" type="xsd:string" />
  </message>
  <message name="QuoteResponse">
    <part name="quote" type="xsd:string" />
  </message>
  <portType name="StockQuoteService">
    <operation name="getQuote">
      <input message="tns:SymbolRequest" />
      <output message="tns:QuoteResponse" />
    </operation>
  </portType>
  <binding name="StockQuoteServiceBinding"
type="tns:StockQuoteService">
    <soap:binding style="rpc"
transport="http://schemas.xmlsoap.org/soap/http" />
    <operation name="getQuote">
      <soap:operation soapAction="http://www.getquote.com/GetQuote" />
      <input>
        <soap:body
encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
namespace="urn:live-stock-quotes" use="encoded" />
      </input>
      <output>
        <soap:body
encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
namespace="urn:live-stock-quotes" use="encoded" />
      </output>
    </operation>
  </binding>
</definitions>
```

```
</binding>
</definitions>
```

The following listing shows an example of a WSDL service implementation definition:

```
<?xml version="1.0" encoding="UTF-8" ?>
<definitions xmlns="http://schemas.xmlsoap.org/wsdl/"
xmlns:interface="http://www.getquote.com/StockQuoteService-
interface" xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
name="StockQuoteService"
targetNamespace="http://www.getquote.com/StockQuoteService">
<import location="http://atpc2tpc:8080/stockquote_services/sqs-
interface.wsdl"
namespace="http://www.getquote.com/StockQuoteService-interface"
/>
<service name="StockQuoteService">
<documentation>Stock Quote Service</documentation>
<port binding="interface:StockQuoteServiceBinding" name="Demo">
<soap:address
location="http://atpc2tpc:8080/soap/servlet/rpcrouter" />
</port>
</service>
</definitions>
```

With regard to the service description, the GovML is regarded as the provider of the service attribute vocabulary.

In order to support fast and easy development and deployment of new services, the SCE might offer a range of development tools, such as

UDDI Browser:

This tool enables the SCE user to interactively browse a Service Directory implemented as an UDDI registry for finding services that have already been defined.

UDDI Editor:

The UDDI editor is used by the SCE users for creating different UDDI entries, including the businessEntity, businessService and tModel information needed for publishing the service in the Service Directory (see chapter 7.4.1).

UDDI Publishing Tools:

UDDI publishing tools take UDDI definitions created with the UDDI editor or generation tools and publish them in the Service Directory. Because portions of these definitions can already exist in the Service Directory, appropriate new or changed elements will be applied to the target Service Directory. Examples of existing entities with new elements include a business entity to which additional services should be added, or a binding template to which additional tModel references should be added.

WSDL Editor:

The WSDL editor is used by service developers who are creating WSDL documents in order to describe services from the scratch.

WSDL Generator:

The WSDL generator produces WSDL interface documents that describe interfaces implemented by existing applications. This tool can be used to automatically generate a WSDL document describing EJBs, JavaBeans, servlets, C++ or Java class files, CORBA

and COM definitions that have already been implemented. This tool also generates WSDL implementation documents.

Service Proxy Generator:

The service proxy generator produces client code from a WSDL interface document, and optionally from a service implementation document. If only the service interface is used, a generic service proxy is generated. This type of a proxy can be used to access any implementation of the service interface. If both a service interface and service implementation are used, a service proxy that will only access the specified service implementation will be generated. The service proxy contains the code that is specific to a binding within the service interface. For example, if the binding is a SOAP binding, the service proxy will contain the SOAP client code that is used to invoke the service. Figure 69 illustrates the generation of service proxies.

Service Implementation Template Generator:

The service implementation template generator can be used to create an implementation template to be filled in by the service developer. The implementation template is created by using only the service interface definition. An example of a service implementation template is a Java interface. Figure 69 illustrates the generation of service implementation templates.

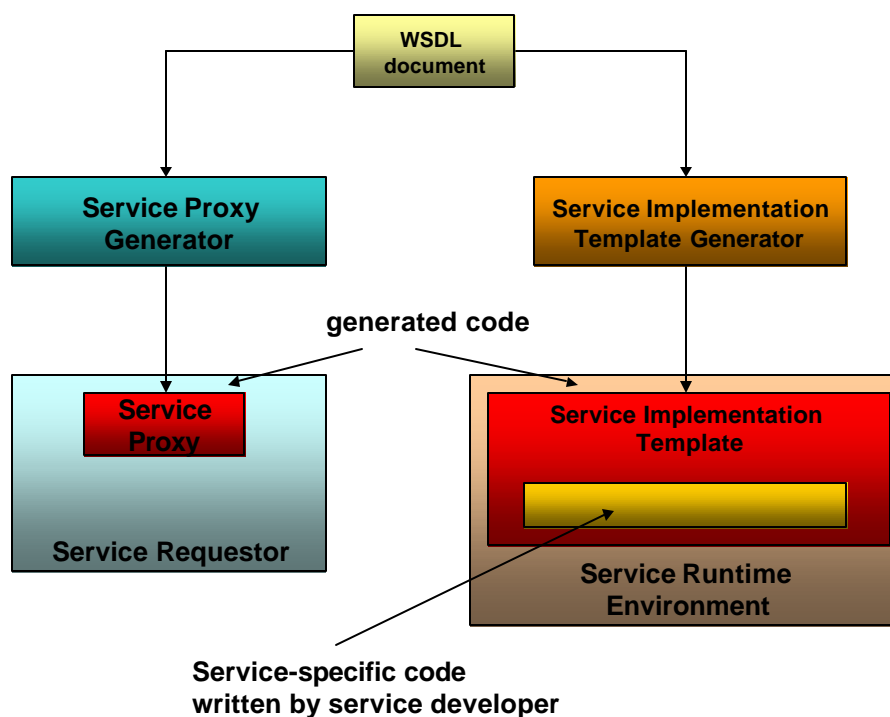


Figure 69 Generating service proxies and service implementation templates from WSDL

7.4 Service Directory

If the SOAP/UDDI/WSDL framework will be utilised for realisation, the Service Directory will be implemented as an UDDI registry and the Service Directory Interface will consist of the UDDI API, an API providing inquiry and publishing functions.

7.4.1 UDDI Information Model

The information model that is communicated via the UDDI API is defined in an XML schema and it basically consists of the following elements:

The **businessEntity** provides information about a business. This structure serves as the top-level information manager for all the information about a particular set of information related to a business unit. The businessEntity information includes support for “yellow pages” taxonomies, so that searches can be performed to locate businesses that service a particular industry or product category or that are located within a specific geographic region. A businessEntity may contain one or more businessServices.

The **businessService** and its bindingTemplates define the technical and business descriptions for a Web service. The businessService is a descriptive container that is used to group a series of related Web services related to either the business process or category of services. Each businessService contains one or more bindingTemplates.

The **bindingTemplate** contains technical descriptions for a Web service. It includes the information that is required for application programs that need to connect to and communicate with a remote Web service, including the address required to contact the Web service. Each bindingTemplate contains a reference to one or more tModels.

A **tModel** is used to describe information about the technical specification of a service. The data about the technical specification include its name, its publishing organisation and the URLs that point to the actual specifications. The specifications are out of the scope of the UDDI framework, they might be defined by using WSDL or any other appropriate schema.

Figure 70 shows the relationship between these entities.

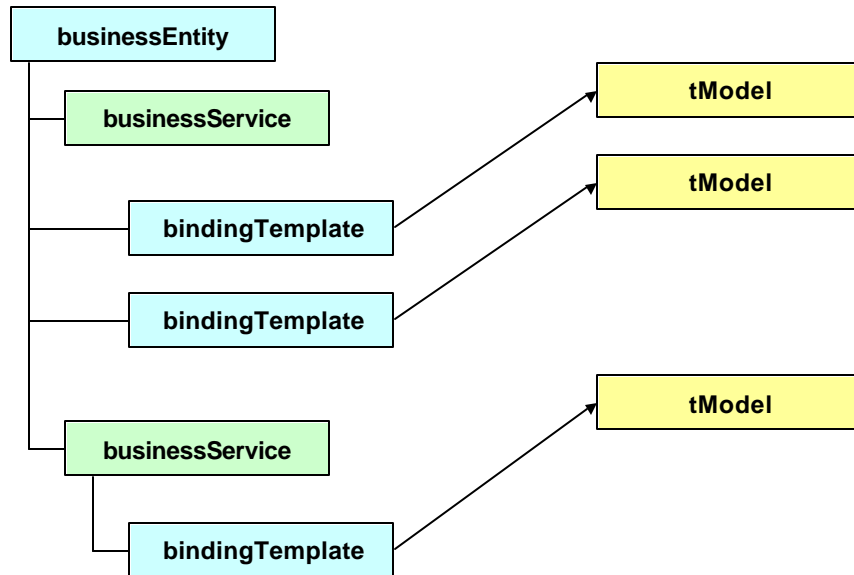


Figure 70 UDDI information model

The following listing shows the example service from chapter 7.3 described in terms of the UDDI information model:

```

<?xml version="1.0"?>
<businessService businessKey="..." serviceKey="...">
<name>StockQuoteService</name>
<description xml:lang="en">
  Stock Quote Service
</description>
<bindingTemplates>
  <bindingTemplate bindingKey="..." serviceKey="...">
    <description>
      Single Symbol Stock Quote Service
    </description>
    <accessPoint URLType="http">
      http://www.getquote.com/singlestockquote
    </accessPoint>
    <tModelInstanceDetails>
      <tModelInstanceInfo tModelKey="[tModel Key for
Service Interface]">
        <instanceDetails>
          <overviewURL>
            http://www.getquote.com/services/SQS.wsdl
          </overviewURL>
        </instanceDetails>
      </tModelInstanceInfo>
    </tModelInstanceDetails>
  </bindingTemplate>

```

```

</bindingTemplates>
<categoryBag>
    <keyedReference tModelKey="UUID:..."
        keyName="Stock market trading services"
        keyValue="..." />
</ categoryBag>
</businessService>

```

The following listing shows a tModel describing the interface of the example service from chapter 7.3:

```

<?xml version="1.0"?>
<tModel tModelKey="...">
    <name>http://www.getquote.com/StockQuoteService-
interface</name>
    <overviewDoc>
        <description xml_lang="en">
            WSDL Service Interface Document
        </description>
        <overviewURL>
            http://www.getquote.com/services/SQS-interface.wsdl#SingleSymbolBinding
        </overviewURL>
    </overviewDoc>
    <categoryBag>
        <keyedReference tModelKey="..." keyName="uddi-
org:types keyValue="wsdlSpec"/>
        <keyedReference tModelKey="..." .../>
    </categoryBag>
</tModel>

```

7.4.2 UDDI API

The UDDI API consists of two logical parts, the **Inquiry API** and the **Publication API**. The Inquiry API can be further divided into two: one part for developing programs that search and browse information in an UDDI registry and another part that is useful in the event that service invocations fail.

The Inquiry API consists of two types of calls that let a program quickly locate candidate businesses, Web services, and specifications and then drill into specifics based on overview information provided in the initial calls. The APIs called *find_xx* provide the caller with a broad overview of registration data based on a variety of search criteria. Alternatively, if the actual keys of specific data are known in advance, copies of particular structures, e.g. businessEntity, businessService, bindingTemplate, tModel, can be retrieved via calls to the *get_xx* APIs.

The Publication API consists of four *save_xx* and four *delete_xx* functions, one for each of the four key UDDI data structures; *businessEntity*, *businessService*, *bindingTemplate*, *tModel*. Once authorised, an individual party can register any number of *businessEntity* or *tModel* information sets and alter previously published information. The API design model is simple: changes to specific related information can be made and new information can be saved. Deletion of complete structures is supported by the delete calls.

7.5 Service Repository

If the SOAP/UDDI/WSDL framework will be utilised for realisation, the Service Repository must basically support the storage, retrieval, and management of XML descriptions.

7.6 Interfaces

7.6.1 Service Runtime Environment

7.6.1.1 Service Requestor Interface

This interface provides the capability to request the invocation of a service and receive the result of a service execution. It is required by the Run Service use case.

7.6.1.2 Service Runtime Administrator Interface

This interface provides, on the one hand, for the execution of non service related management tasks (fault and configuration management) for the Service Runtime Environment and, on the other hand, for receiving notifications (alarms) emitted by the Service Runtime Environment (fault management).

It is required by the Manage Service Runtime use case.

Depending on the requirements, it can be implemented as a man-machine interface, i.e. a GUI and/or a command line interface, or a machine-machine interface, i.e. an API or a protocol (XML-RPC, SNMP etc.), or both types of interfaces.

7.6.2 Service Creation Environment

7.6.2.1 Service Provider Interface

This interface provides access to the SCE for the Service Provider. It could be realised as a GUI and/or command line interface.

This interface must support the Build Service, Deploy Service, and Manage Service use cases.

7.6.3 Service Directory

7.6.3.1 Service Directory Interface

This interface provides functions such as publishing services to the Service Directory, removing services and retrieving service data from the Service Directory, and finding and updating services in the Service Directory.

It is required by each of the four service-related use cases:

- the Build Service use case: find services in and retrieve service data from the Service Directory if a new service is composed of other eGOV services,
- the Deploy Service use case: publish services in the Service Directory. Note: if the central authority calls the interface, only the central Service Directory is changed. If some other public authority calls the interface, the central as well as the associated local Service Directory are changed.
- the Manage Service use case: update services in and remove services from the Service Directory. Note: if central authority calls the interface, only the central Service Directory is changed. If some other public authority calls the interface, the central as well as the associated local Service Directory are changed.
- the Run Service use case: find services in and retrieve service data from the Service Directory if dynamic binding to the requested service is applied by the Service Requestor.

7.6.4 Service Repository

7.6.4.1 Service Repository Interface

This interface provides functions such as adding services to the Service Repository, removing services and retrieving services from the Service Repository and finding and updating services in the Service Repository.

It is required by each the four service-related use cases:

- the Build Service use case: retrieve Service Descriptions from the Service Repository if a new service is composed of other eGOV services,
- the Deploy Service use case: add services to the Service Repository, i.e. add all service-related data, such as the Service Description as well as all data required for the execution of the service (Service Realisation),
- the Run Service use case: the SRE loads all data required for the execution of elementary as well as composite eGOV services from the Service Repository and any additional deployment data specific to the SRE.
- the Manage Service use case: update services in and remove services from the Service Repository.

7.7 Message Flows

7.7.1 Build Service

7.7.1.1 Build Elementary EGov Service

The following figure shows the actions required for implementing a new elementary eGOV service, i.e. a service that does not invoke other eGOV services.

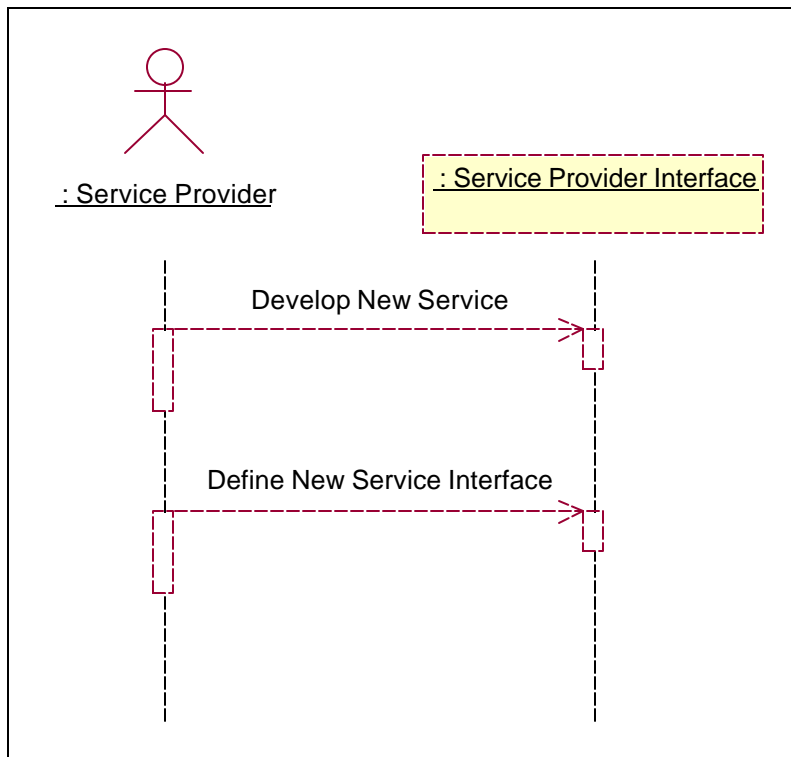


Figure 71 Building a elementary eGOV service

This message flow comprises the following steps (Note: elementary eGOV services will be described but not implemented. Consider that a elementary eGOV service is perhaps the submission of a certificate):

- The first step is to describe the elementary eGOV service.
- After the description of the elementary eGOV service, the service interface definition can be implemented. This can be done manually or automatically from the interfaces of the application by using a tool provide d by the SCE.

7.7.1.2 Build Composite EGov Service

The following figure shows the actions required for implementing a new composite eGOV service, i.e. a service that invokes one or more eGOV services.

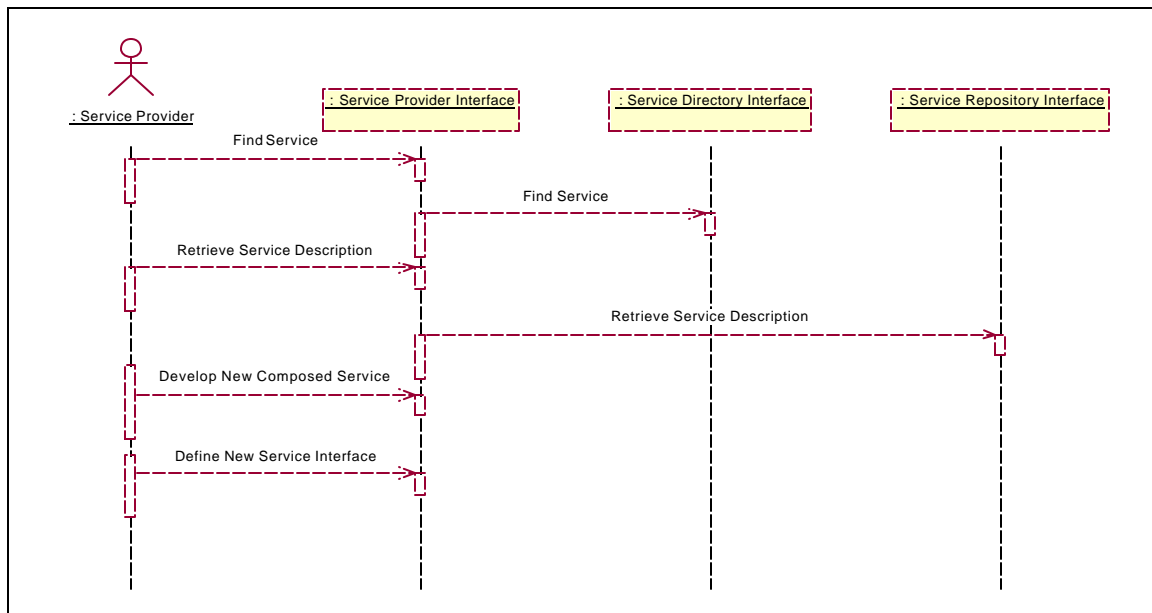


Figure 72 Building a composite eGOV service

The following steps are contained in this message flow:

- First of all, locating the desired services, i.e. the services that will be invoked from the new composite eGOV service, and retrieving the associated service data from the Service Directory is initiated via the Service Provider Interface.
- The SCE locates the desired services and retrieves the service data via the Service Directory Interface.
- The retrieval of the Service Descriptions for the services that will be invoked by the new composite eGOV service is initiated via the Service Provider Interface.
- The SCE performs the retrieval of the Service Descriptions for the services that will be invoked by the new composite eGOV service via the Service Repository Interface.
- The next step is to design and implement the application that represents the composite eGOV service. This includes:
 - the integration of the eGOV services to be invoked. This is dependent on the programming model applied.
 - the testing in order to verify that all of its interfaces work correctly.

In terms of this model, this means creating a Service Realisation.

- After the application representing the service has been developed, the service interface definition can be implemented. This can be done manually or generated automatically from the interfaces of the application with an appropriate tool provided by the SCE.

7.7.2 Deploy Service

The following figure shows the actions required for deploying a new service.

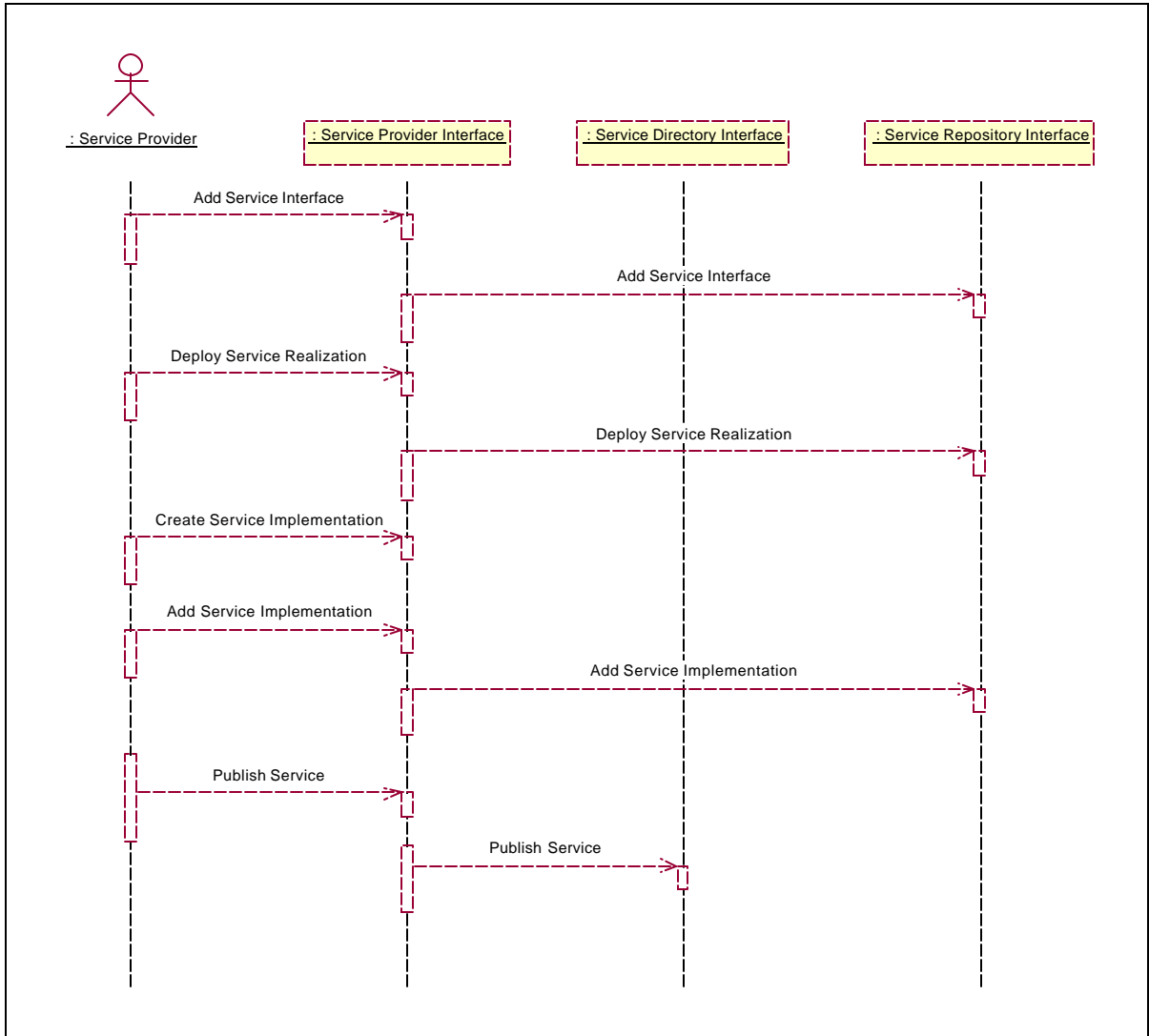


Figure 73 Deploying a service

This message flow comprises the following steps:

- First of all, adding of the service interface description to the Service Repository is initiated via the Service Provider Interface.
- The SCE adds the service interface description to the Service Repository via the Service Repository Interface.
- In the next step, the deployment of the Service Realisation is initiated via the Service Provider Interface.

- The SCE adds all data that are required to describe the implementation of elementary as well as of composite eGOV services to the Service Repository via the Service Repository Interface.
- The service implementation description is created by the Service Provider based on how and where the service should be deployed.
- In the next step, the adding of the service implementation description to the Service Repository is initiated via the Service Repository Interface.
- The SCE adds the service implementation description to the Service Repository via the Service Repository Interface.
- The publishing of the service in the Service Directory is initiated by the Service Provider via the Service Provider Interface.
- The SCE publishes the service in the Service Directory via the Service Directory Interface. In case of the central SCE instance, the service has to be published only in the central Service Directory. In case of any other SCE, the service has to be published in the associated local as well as in the central Service Directory.

7.7.3 Run Service

7.7.3.1 Run Service with Static Binding

The following figure shows the actions required for running a service with static binding.

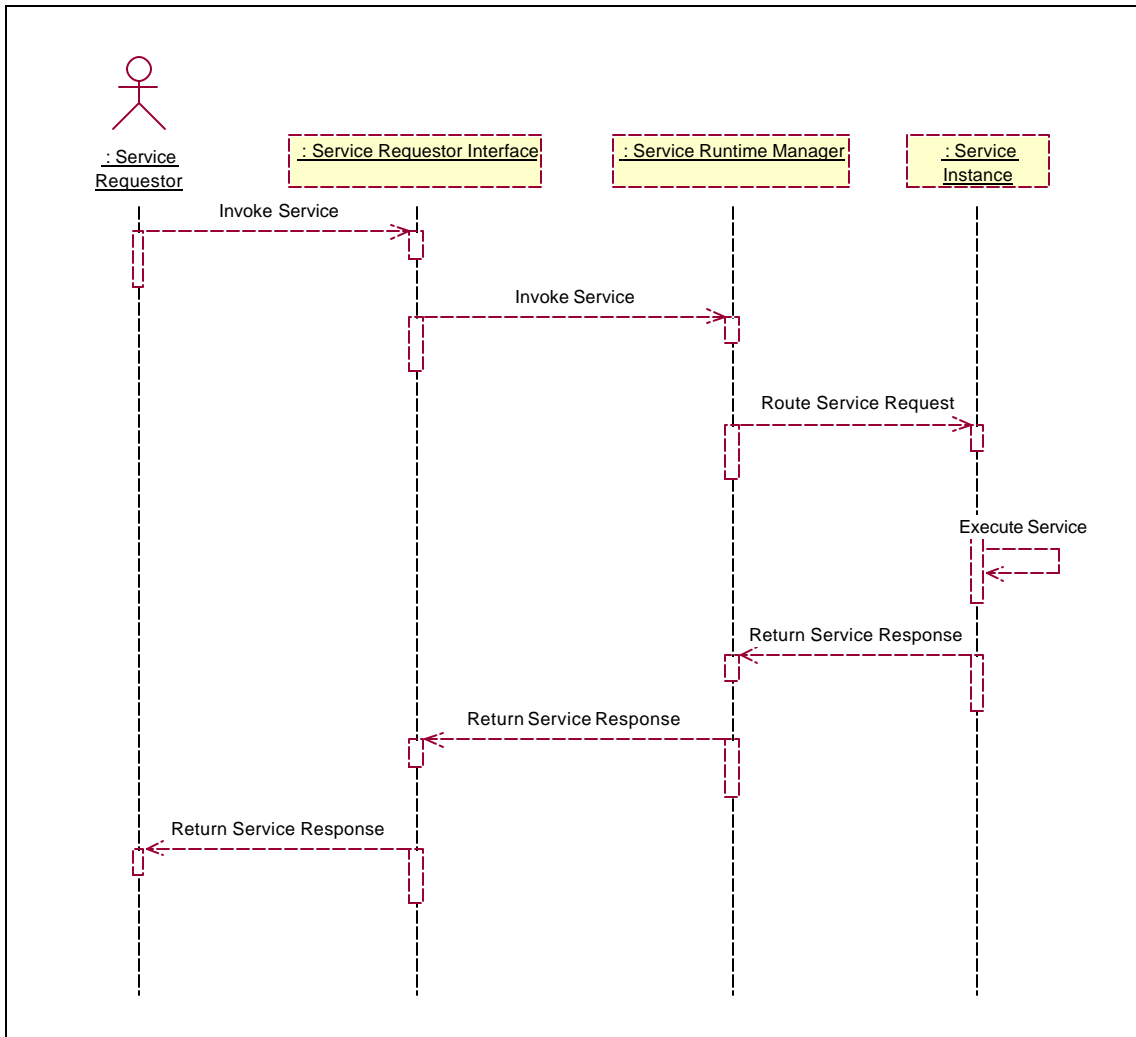


Figure 74 Running a service with static binding

This message flow comprises the following steps:

- The Service Requestor invokes the requested service via the Service Requestor Interface.
- The Service Requestor Interface passes the request on to the Service Runtime Manager.
- The Service Runtime Manager routes the request to the appropriate Service Instance.
- The Service Instance executes the invoked service.
- The Service Instance returns the result of the service execution to the Service Runtime Manager.
- The Service Runtime Manager returns the result of the service execution to the Service Requestor Interface.
- The Service Requestor Interface propagates the result of the service execution to the Service Requestor.

7.7.3.2 Run Service with Dynamic Binding

The following figure shows the actions required for running a service with dynamic binding. It only shows the actions that are additional to the invocation of a service with static binding.

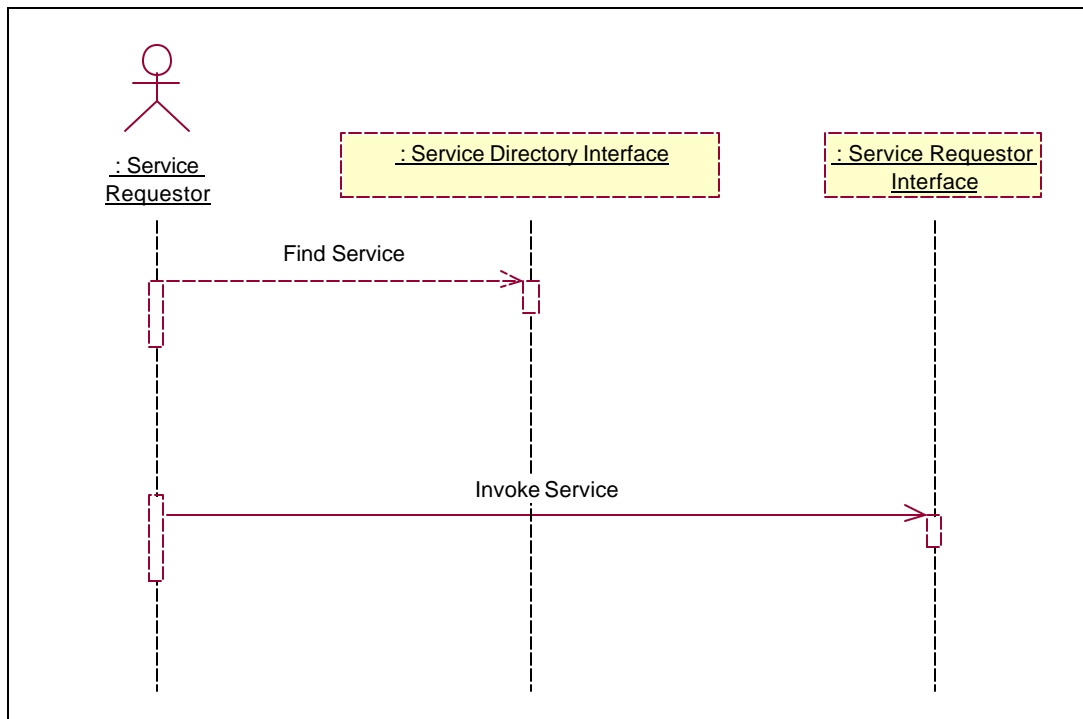


Figure 75 Running a service with dynamic binding

This message flow comprises the following steps:

The Service Requestor locates the requested service by using the Service Directory via the Service Directory Interface.

The Service Requestor invokes the service hosted by the SRE via the Service Requestor Interface.

Abbreviations

API	Application Programming Interface
B2B	Business to Business
COM	Component Object Model
CORBA	Common Object Request Broker Architecture
DTD	Document Type Definition
EJB	Enterprise Java Bean
FTP	File Transfer Protocol
GovML	Governmental Markup Language
GUI	Graphical User Interface
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
LDAP	Lightweight Directory Access Protocol
RDBMS	Relational Database Management System
RDF	Resource Description Framework
RMP	Remote Method Protocol
RPC	Remote Procedure Call
SD	Service Directory.
SOAP	Simple Object Access Protocol
SCE	Service Creation Environment
SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SR	Service Repository
SRE	Service Runtime Environment
SSL	Secure Socket Layer
UML	Unified Modelling Language
UDDI	Universal Description, Discovery, and Integration
URI	Universal Resource Identifier
URL	Uniform Resource Locator
WAP	Wireless Application Protocol
WSDL	Web Services Description Language
WSFL	Web Services Flow Language
WTLS	Wireless Transport Layer Security
XML	eXtensible Markup Language
XSL	eXtensible Style Language

Appendix A: Portal Use Cases

A.1 User roles explanations

Citizen

Citizen describes the user that uses the portal. The citizen can also be the user role in case of the business affairs.

Portal admin

Portal admin is a user who maintains the portal. The portal admin creates life-events, profiles and maintains service and content directories.

Authentication data

Authentication data contain services and information to authenticate the citizen. Authentication data can be e.g. a LDAP directory.

Service metadata

Service metadata is a meta-database where service interfaces are published. The service directory helps to find a service and the service provider.

Content metadata

Content metadata is a meta-database where the content metadata is published. Content metadata is based on GovML.

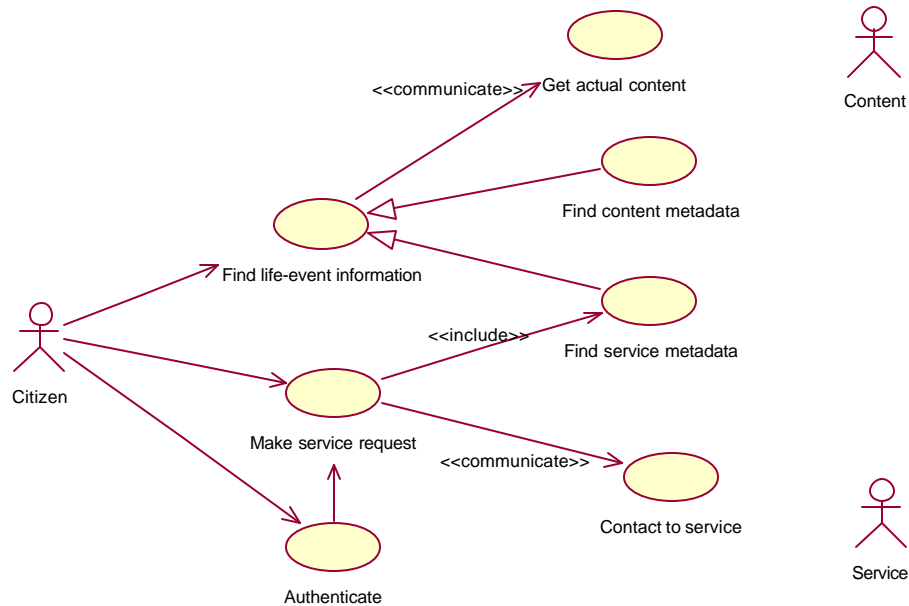
Actual content

Actual content represents the place or system where the textual content resides and is maintained.

Actual service

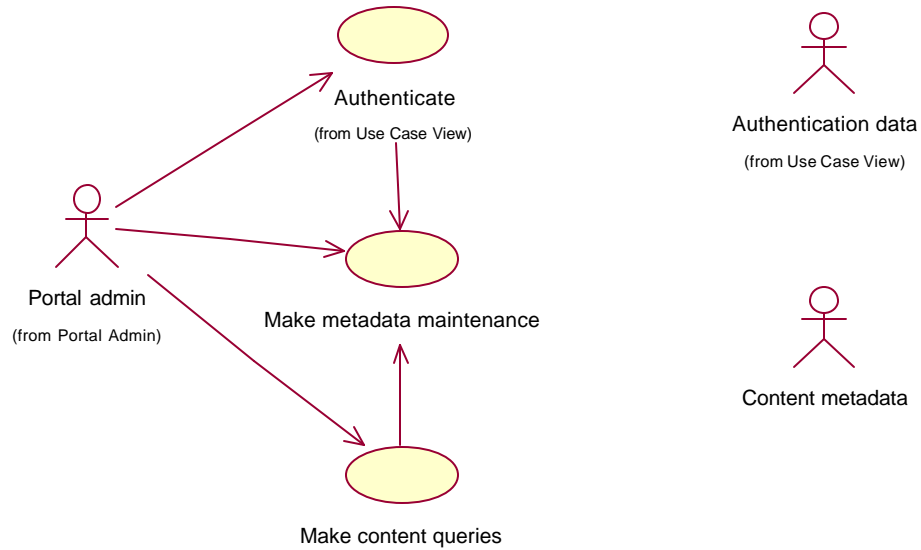
Actual service represents the system where the actual service is provided.

A.2 Use case: Find life-event information



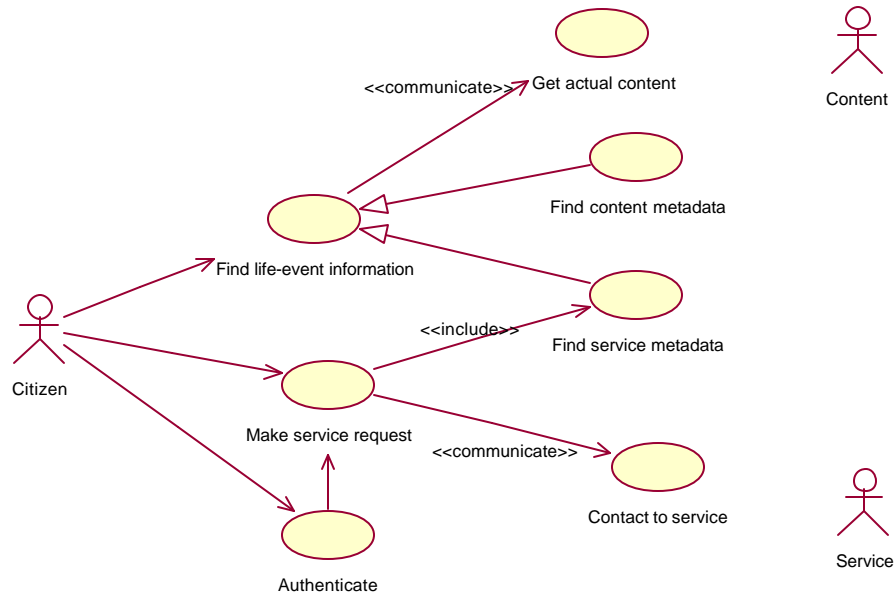
Summary	In this use case the user can find life-event he/she is interested in
Event density	Every time when the user open the portal page
Actors	Citizen
Precondition	The citizen knows what kind of information he/she needs
Result	Textual content of the life-event and links to the services joining to it
Description	<p>The citizen/user (in case of business affairs) selects a predefined profile or gets all life-events that the portal can offer. The citizen selects one of the life-events and gets a list of the content links and possible transaction services connected to it.</p> <p>The user can drill-down deeper to find exactly the content and services she/he is interested in. At the final level the user has got a page with textual content from the originator site and transaction services associated with it.</p>
Error situations	
Exceptions	
Other	
Used classes	UserPage, Profile, Life-event

A.3 Use case: Make content queries



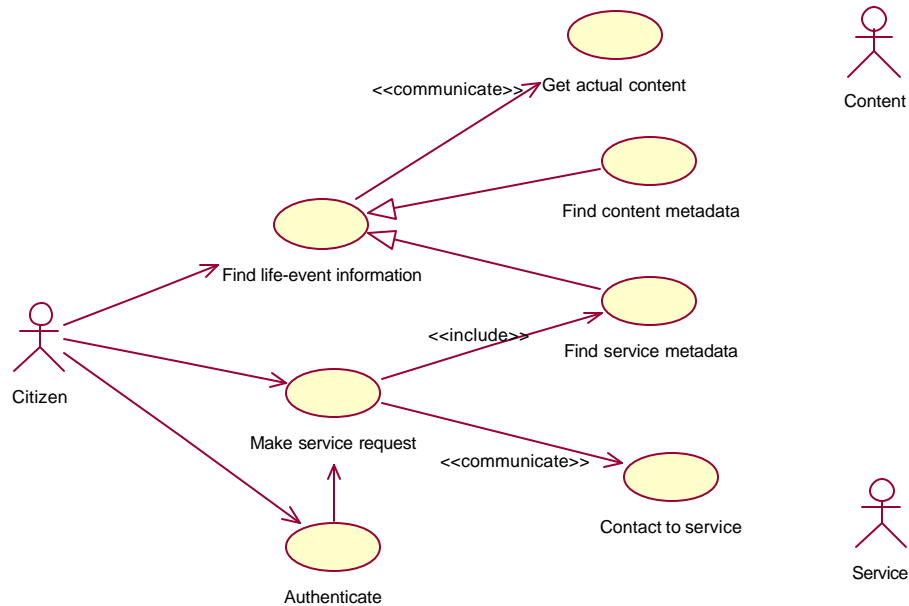
Summary	In this use case the portal admin can make queries to the existing content metadata.
Event density	Every time the portal admin is interested in the content metadata that is registered in content metadata directory
Actors	Portal admin
Precondition	
Result	List of the content which fills the conditions of the query
Description	The portal admin has a query interface to the content metadata directory. He/she can make queries according to the metadata fields. (will be specified in GovML)
Error situations	
Exceptions	
Other	
Used classes	Admin page, content

A.4 Use case: Make service request



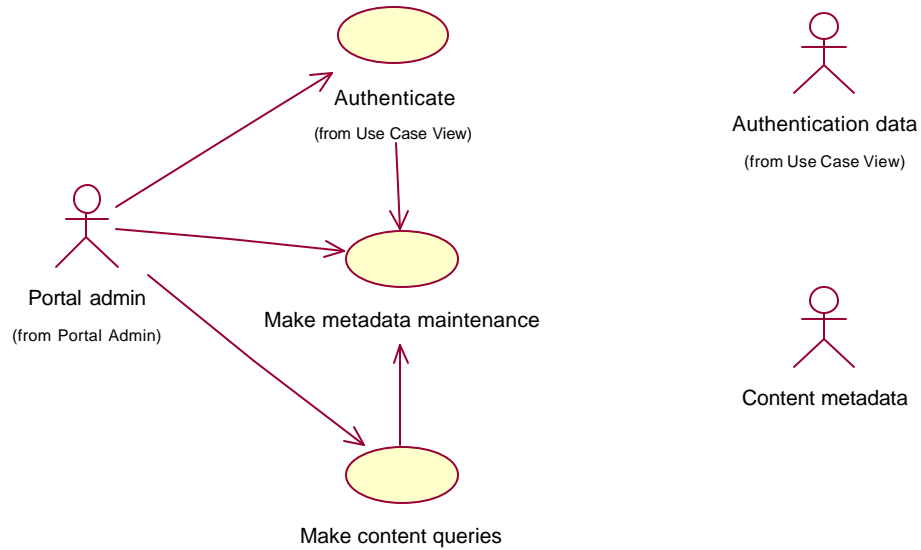
Summary	In this use case the user gets a transaction started
Event density	Every time when the user needs transaction services
Actors	Citizen
Precondition	The citizen has performed the use case 'Find life-event information'. The citizen knows what kind of service he/she needs
Result	Filled form sent to the actual service
Description	The citizen/user (in case of business transactions) selects a service link. If the service needs authentication, the user is redirected to the authentication service. The user gets the form to fill-in. After filling the form, the user sends it to the actual service.
Error situations	
Exceptions	The form is printed to the paper and sent by mail
Other	
Used classes	UserPage, Service, Authentication

A.5 Use case: Authenticate



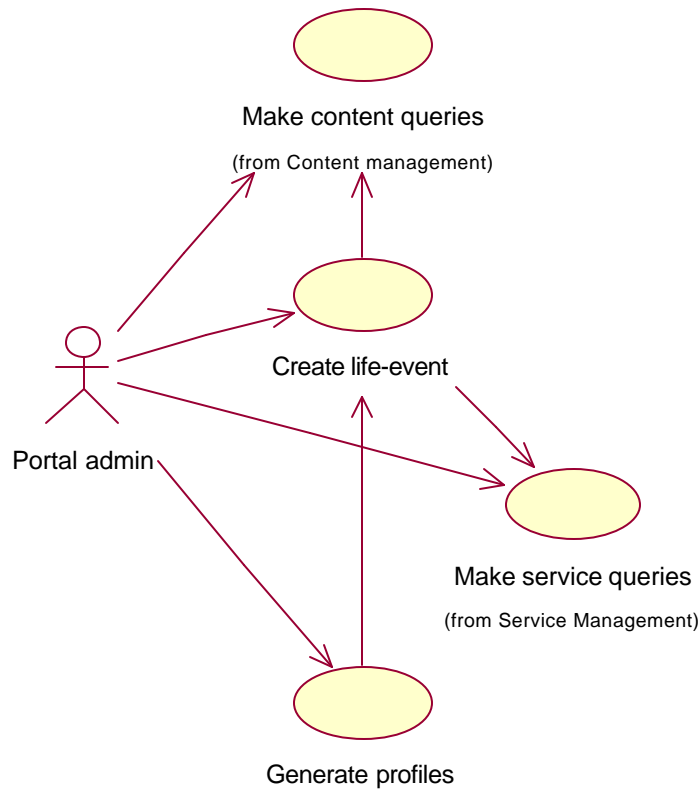
Summary	In this use case the user authenticates himself/herself
Event density	Every time the user is using a service that needs authentication
Actors	Citizen, PortalAdmin
Precondition	The citizen has to have credentials to authenticate
Result	Authenticated citizen
Description	The portal redirects the citizen to the authentication service if the service that the citizen wants to use requires user authentication. Authentication asks for citizens credentials (pin code/username and password) and checks the validity of the users certificate or given password. When the certificate has been checked the authentication redirects the user back.
Error situations	Citizens certificate has been expired.
Exceptions	
Other	Smart card base authentication relies on the existing PKI infrastructure
Used classes	Authenticate

A.6 Use case: Make metadata maintenance



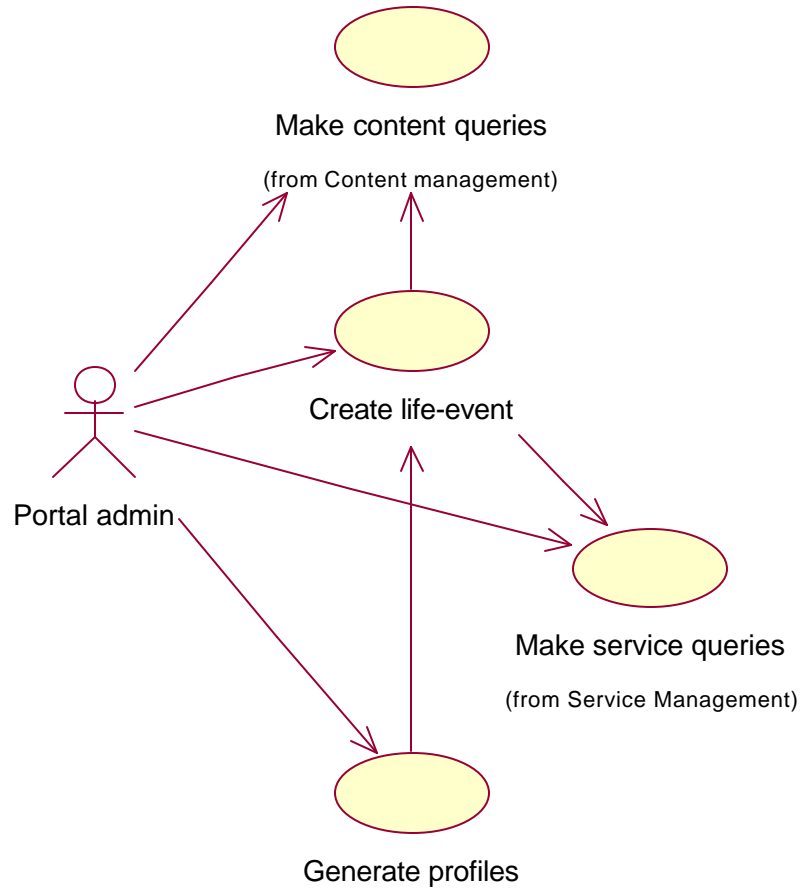
Summary	In this use case the portal admin performs content metadata maintenance.
Event density	Every time the portal admin wants to add, modify or delete content from the content metadata directory
Actors	Portal admin
Precondition	Portal admin is authenticated
Result	Updated content
Description	The portal admin can add, delete or update metadata to the metadata directory.
Error situations	
Exceptions	
Other	
Used classes	Admin page, content

A.7 Use case: Create life-event



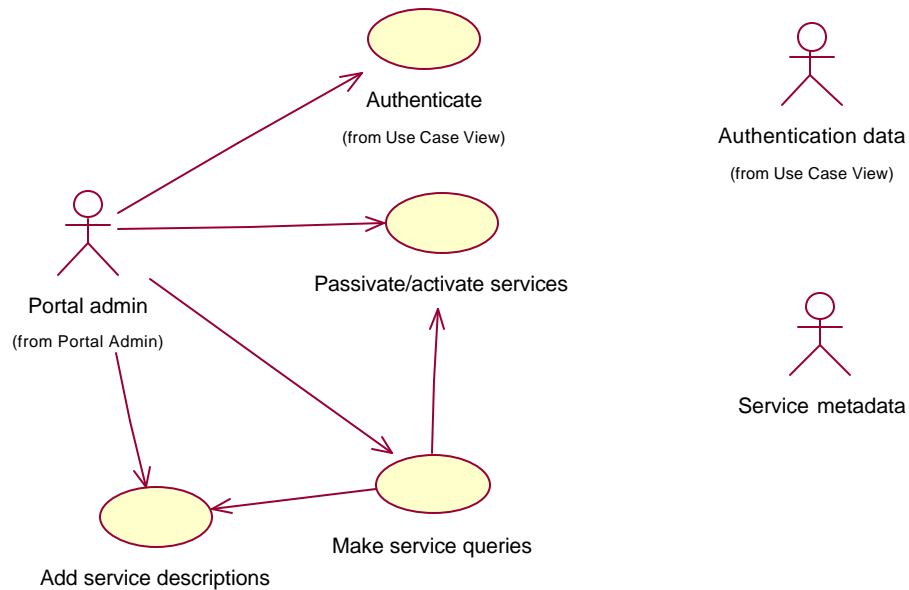
Summary	In this use case the portal admin can create life-events.
Event density	Every time a new life-event is needed
Actors	Portal admin
Precondition	Portal admin is authenticated
Result	New or update life-event
Description	The portal admin collects information from the service metadata and the content metadata directories, combines them and creates a life-event. A life-event can either be published to all users or it can be only visible through a certain predefined user profile.
Error situations	
Exceptions	
Other	
Used classes	Admin page, profile, life-event, authentication

A.8 Use case: Generate profiles



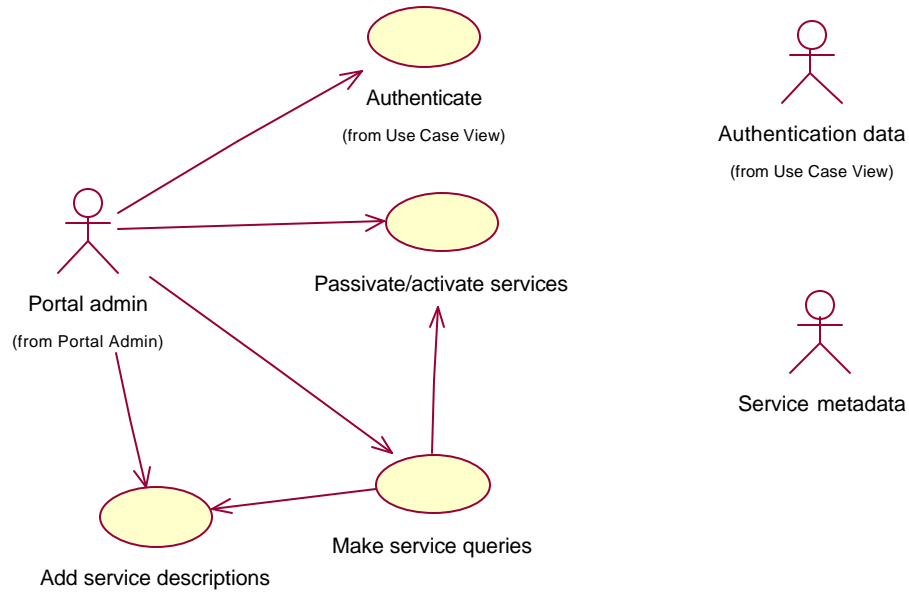
Summary	In this use case the portal admin can create and maintain predefined profiles.
Event density	Every time the portal needs a new profile
Actors	Portal admin
Precondition	Portal admin is authenticated
Result	New or updated profile
Description	The portal admin generates profiles and adds some life-events to it.
Error situations	
Exceptions	
Other	
Used classes	Admin page, profile, life-event

A.9 Use case: Add service description



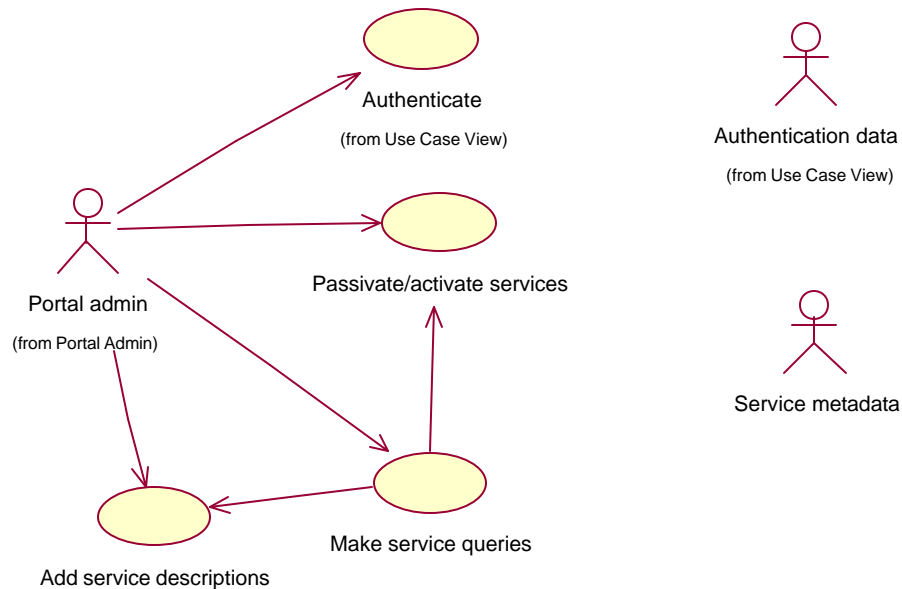
Summary	In this use case the portal admin can add a service description to the service metadata directory
Event density	Every time a service can't register to the service directory automatically
Actors	Portal admin
Precondition	The portal admin is authenticated and he/she knows the service to be added
Result	Updated/inserted service description to the service metadata directory
Description	The portal admin has a service description he/she wants to add to the service metadata directory. The portal admin opens the admin page and the user interface where he/she can add the service description.
Error situations	
Exceptions	
Other	Service descriptions have to follow the WSDL specification
Used classes	Admin page, service

A.10 Use case: Make service queries



Summary	In this use case the portal admin can make queries of the existing services.
Event density	Every time the portal admin wants to know what kind of services are registered in the service metadata directory.
Actors	Portal admin
Precondition	Portal admin is authenticated
Result	List of the services that fill the conditions of the query
Description	The portal admin has a query interface to the service metadata directory. He/she can make queries according the service publisher, the service name, the service status and the service category
Error situations	
Exceptions	
Other	
Used classes	Admin page, service

A.11 Use case: Passivate/activate services



Summary	In this use case the portal admin can change the service status.
Event density	Every time the portal admin wants to show a service or de-activate it.
Actors	Portal admin
Precondition	Portal admin is authenticated, the make service query is done
Result	The service will be either shown to the user or prevented from showing.
Description	The portal admin has a query interface to the service metadata directory. He/she can make queries according the service publisher, the service name, the service status and the service category. The portal admin can change the status of the service.
Error situations	
Exceptions	
Other	
Used classes	Admin page, service

Appendix B: Questionnaires

B.1 Citizens Questionnaire

Personal Information

What is your name? (optional) :

What is your e-mail? (optional):

What is your gender?

Male Female

Which of the following categories includes your age?

13 - 17 18 - 34 35 - 54 55+

What is your education level ?

Primary school High-school Graduate studies Postgraduate studies

Do you live in an urban, suburban or rural area?

Urban Suburban Rural

Do you use a computer?

Yes, at home Yes, at work Both None

Do you have Internet access?

Yes, at home Yes, at work Both None

If you do not have Internet access:

what are the main reasons?

	Extremely Important	Very Important	Important	Not at all Important	Don't know
1. Too complex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Too expensive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Not enough information / services on the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I am concerned about security, privacy etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Would you consider obtaining one if you could handle most transactions with the public sector through it?

Yes No

Do you think that the use of Internet/computers will increase or decrease the level of democracy?

Increase democracy Decrease Democracy Not sure/don't know

Public Services

In your opinion, what is the level of public services?

Very Good

Good, but there is room for further improvement

Not good

Unacceptably poor

Please indicate how important is each of the propositions below to improve the quality of public services?

	Extremely Important	Very Important	Important	Not at all Important	Don't know
Increasing the number of public workers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Re-organising public administration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training public workers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Employing technology within the public sector	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Employing technology for the communication between citizens and public sector	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Privatising some public services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please indicate how important is for you that public services are delivered through?

	Extremely Important	Very Important	Important	Not at all Important	Don't know
1. Dedicated offices for all services (one-stop shop)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Telephone (call center)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Post	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Mobile phones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you know any public sector initiative aiming to improve public services?

Yes No

If yes, could you name a few?

.....

Do you think that the public sector should work together (e.g. outsourcing) with the private sector in providing public services?

Strongly Agree	Agree	Disagree	Strongly Disagree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What will be the implications of that collaboration?

	Significantly Improved	Marginally Improved	Marginally Decreased	Significantly Decreased
Number of Services Available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of Services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Security/Privacy Issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Services to special groups (disabled)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Public Services over the Internet (for Internet users)

Is there governmental information available for you on the Internet?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

If yes, how often do you use Internet for searching governmental information ?

- daily
- several times a week
- once a week
- randomly
- never

If not, would you use them if they were made available to you?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

Have you ever visited a Governmental website (Ministries, Municipalities etc)?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

If yes, which one you are visiting more often? www.....

please specify the reason:

please describe the services provided:

how would you rate that site?

Excellent	Satisfactory	Quite Poor	Poor
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If there would be public services offered to you online, how important would you rate the following?

	Very Important	Important	Somewhat Important	Not Important
Up-to-date information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Edited content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thematically structured content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User related personalised services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Two-way communication services (questions, complaints, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transaction services (payments, certificate applications etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What do you believe is the greatest potential benefit of the government using the Internet for the provision of services?

Portal Features and Services (for Internet users)

Definition: Portal is a personalised single point of interaction with relevant applications and information.

Are you familiar with the “portal” concept ?

Yes No

How important do you consider a portal for the whole public sector?

Very important	Important	Somewhat Important	Not Important
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you know that there is currently a portal at www.help.gv.at/www.polites.gr/www.ch.ch (use as appropriate)?

Yes No

If Yes,

have you ever visited it?

Yes No

how would you rate that site?

Excellent Satisfactory Quite Poor Poor

do you think that it should be further improved?

Yes No

Please indicate how important each of the following is to a governmental portal:

	Extremely Important	Very Important	Important	Not at all Important	Don't know
1. Current/Up-to-date information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Security	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Privacy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. One-stop shop capability (one portal for all government services)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Easy to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Trustworthy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Reliable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Time-saving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Consistent look	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Ability to Personalise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. multilinguality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. special user groups (e.g. visually impaired)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Timely feedback	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The governmental portal will probably provide many types of interactions and transactions. Please indicate which of the following you would use online:

	Would use Today	Would use in future	Would NOT use
1. Look up community news & data (i.e. tax rates, population, local news, city maps etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Online question/ answer service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Look up tourist information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Would use Today	Would use in future	Would NOT use
4. Pay taxes, speeding/ parking tickets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Register to vote	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Vote online	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Request personal information (i.e. birth, marriage, death certificate)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Track current and proposed legislation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Registering for benefits/ Sign petitions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. File a complaint / report a problem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Renew a passport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If services/information based on several sources would be provided on single site, would you rather have them categorised by :

the service providers the related topics

If you were to access public services through a portal of some kind, how important would it be for you to know which organisation provides the given service ?

Very important Important Somewhat Important Not Important

Would you wish to have external services (for example commercial services related to a given topic, services of other public organisations) available through the portal?

Yes No

How important would you see that the following would be included?

	Very Important	Important	Somewhat Important	Not Important
External information/service providers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Commercial companies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
non-governmental organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
non-profit organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other public sector organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If there was a portal operated by the public authorities providing both public and private sector information and services together, how important do you consider clearly mentioning the provider?

Very important Important Somewhat Important Not Important

How interested would you be in having the following services provided?

	Very Interested	Interested	Somewhat Interested	Not Interested
User specific customised services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Navigating a frequently visited site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Content of this site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Application interfaces provided	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How interested are you in using mobile technologies for accessing public services in the future ?

Very interested	Interested	Somewhat interested	Not interested
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Would you feel any additional risk that the private information you enter to complete a transaction would be compromised? Please specify

How likely is it that you would conduct transactions through the governmental portal, if these were available?

Very likely	Somewhat likely	Somewhat unlikely	Very unlikely
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you had the possibility to perform online financial transactions that are recurring (such as tax bills or utility bills), would you want the site to send you a reminder when your next payment is due (when you have to renew your business license, etc.)?

Yes No

Name the type of financial transactions you would use if available? (e.g tax, fines, bills)

B.2 Businesses Questionnaire

General business information

What is the name of your company? (optional) :.....

What is your name and e-mail? (optional):

Which of the following categories corresponds to the size of your company?

(Number of Employees)

1-20

21-50

51-250

251 and more

Which of the following categories corresponds to the nature of your business?

- Manufacturing
- Wholesale/Distributor
- Financial
- Consumer Services
- Retail
- Other (Please specify) _____

Do you use computers in your business?

Yes No

Does your business have Internet access and/or presence?

Both only access only presence None

If you do not have Internet access:

what are the main reasons?

		Extremely Important	Very Important	Important	Not at all Important	Don't know
1.	There is no added value for my business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Too complex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Too expensive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Not enough information / services on the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	I am concerned about security, privacy etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

would you consider obtaining one if you could handle most transactions with the public sector through it?

Yes No

Public Services

In your opinion, what is the level of public services with regards to businesses?

- Very Good
- Good, but there is room for further improvement
- Not good
- Unacceptably poor

Please indicate how important each of the propositions below is for improving the quality of public services?

	Extremely Important	Very Important	Important	Not at all Important	Don't know
Increasing the number of public workers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Re-organising public administration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training public workers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Employing technology within the public sector	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Employing technology for the communication between citizens and public sector	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Privatising some public services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please indicate how important is for your business that public services are delivered through?

	Extremely Important	Very Important	Important	Not at all Important	Don't know
Dedicated offices for all services (one-stop shop)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Telephone (call center)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mobile phones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you know any public sector initiative aiming to improve public services for businesses?

Yes No

If yes, could you name a few?

Do you think that the public sector should work together (e.g. outsourcing) with the private sector in providing public services?

Strongly Agree Agree Disagree Strongly Disagree

What will be the implications of that collaboration?

	Significantly Improved	Marginally Improved	Marginally Decreased	Significantly Decreased
Number of Services Available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of Services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Security/Privacy Issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Services to special groups (disabled)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Public Services over the Internet (for Internet users)

How often do you typically make use of the Internet for business purposes?

Several times a day	Less than once a week
Once a day	Not at all
Several times a week	

How often do you typically access the Internet?

Several times a day	Once a week
Once a day	randomly
Several times a week	Never

How reliable do you find the Information on the Internet?

Reliable	Somewhat unreliable
Mostly reliable	Mostly unreliable
Somewhat reliable	Unreliable

How up-to-date do you find the Information on the Internet?

up-to-date	somewhat old
mostly up-to-date	mostly old
somewhat up-to-date	old

How useful do you find the Information on the Internet?

useful	somewhat useless
mostly useful	mostly useless
somewhat useful	useless

Which of the following have you used for searching Information on the Internet: Search engines (Altavista, HotBot, Google etc.), Directories (Yahoo), Virtual libraries, News groups, Mailing lists, Agent services, Web casting services?

Is there governmental information available for businesses on the Internet?

Yes

No

If yes, how often do you use Internet for searching governmental information?

- daily
- several times a week
- once a week
- randomly
- never

If not, would you use them if they were made available to you?

Yes No

Have you ever visited a Governmental website (Ministries, Municipalities etc)?

Yes No

If yes,

which one you are visiting more often? www.....

please specify the reason:

please describe the services provided:

how would you rate that site?

Excellent Satisfactory Quite Poor Poor

If there would be public services offered to your business online, how important would you rate the following?

	Very Important	Important	Somewhat Important	Not Important
Up-to-date information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Edited content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thematically structured content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User related personalised services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Two-way communication services (questions, complaints, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transaction services (payments, certificate applications etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What do you believe is the greatest potential benefit for your business of the government using the Internet for the provision of services?

Portal Features and Services (for Internet users)

Definition: Portal is a personalised single point of interaction with relevant applications and information..

Are you familiar with the “portal” concept?

Yes No

How important is a portal for the whole public sector?

Very important Important Somewhat Important Not Important

Do you know that there is currently a portal at www.help.gv.at/www.polites.gr/www.ch.ch (*use as appropriate*)?

Yes No

If Yes, have you ever visited it?

Yes No

how would you rate that site?

Excellent Satisfactory Quite Poor Poor

do you think that it should be further improved?

Yes No

Please indicate how important each of the following is to a governmental portal:

	Extremely Important	Very Important	Important	Not at all Important	Don't know
1. Current/Up-t-o-date information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Security	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Privacy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. One-stop shop capability (one portal for all government services)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Easy to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Trustworthy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Reliable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Time-saving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Consistent look	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Ability to Personalise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Multilinguality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Special user groups (e.g. business sectors)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Extremely Important	Very Important	Important	Not at all Important	Don't know
13. Timely feedback	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The governmental portal will probably provide many types of interactions and transactions. Please indicate which of the following you would use online:

	Would use Today	Would use in future	Would NOT use
1. Look up community news & data (i.e. tax rates, population, commercial news)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Online question/ answer service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Look up tourist information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Pay taxes, speeding/ parking tickets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Register to vote	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Vote online	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Request business-related information (i.e. renew licence etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Track current and proposed legislation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Registering for benefits/ Sign petitions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. File a complaint / report a problem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Automated public procurement process: search one place for bidding opportunities, submit bids for government contracts, track status and sign contracts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If services/information based on several sources would be provided on single site, would you rather have them categorised by :

the service providers the related topics

If you were to access public services through a portal of some kind, how important would it be for you to know which organisation provides the given service ?

Very important Important Somewhat Important Not Important

Would you wish to have external services (for example commercial services related to a given topic, services of other public organisations) available through the portal?

Yes No

How important would you see that the following would be included?

	Very Important	Important	Somewhat Important	Not Important
external information/service providers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
commercial companies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
non-governmental organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
non-profit organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other public sector organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If there was a portal operated by the public authorities providing both public and private sector information and services together, how important do you consider clearly mentioning the provider?

Very important Important Somewhat Important Not Important

How interested would you be in having the following services provided?

	Very Interested	Interested	Somewhat Interested	Not Interested
User specific customised services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
navigating a frequently visited site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
content of this site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
application interfaces provided	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Would you feel any additional risk that the private information your business enters to complete a transaction would be compromised? Please specify

How likely is it that your business would conduct transactions through the governmental portal, if these were available?

Very likely Somewhat likely Somewhat unlikely Very unlikely

If your business had the possibility to perform online financial transactions that are recurring (such as tax bills or utility bills), would you want the site to send you a reminder when your next payment is due (when you have to renew your business license, etc.)?

Yes No

B.3 Public Authorities Questionnaire: eGOV Portal Features

General Information

Describe the basic roles at your institution (e.g. official in charge, executive officer, IT manager, tax officer, security officer, etc.)?

Name the basic roles at your department?

Which role have you got within your department?

What are the responsibilities and obligations of your department?

What formal organisational structure(s) exists in your institution? (multiple choice possible)

Strict hierarchy

Partial hierarchy

Teamwork

Taskforce

Matrix

Other: _____

Web publishing

Would you prefer to organise your web publishing in the future by using: dynamic web pages, static web pages or both?

Static pages

Dynamic Pages

Both

Would you rather see your future content publishing and content management model as centralised or decentralised?

Centralised

More centralised

More decentralised

Decentralised

When offering public services/information online based on several sources, would you rather have them categorised by: service providers or the related topics?

Service Providers

Related topics

How important would you see the possibility to offer data centrally for distribution regardless of its origin in the future?

Very Important

Important

Somewhat Important

Not Important

Taking into account your future services do you consider the metadata important (yes, no)?

(Definition: In short metadata can be defined as "data about data" or "data describing data resources").

Yes No

Services provided

When offering public services online, how important would you rate the following:

	Very Important	Important	Somewhat Important	Not Important
up-to-date information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Edited content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
thematically structured content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
user related personalised services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How important would you see that the following would be included?

	Very Important	Important	Somewhat Important	Not Important
external information/service providers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
commercial companies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
non-governmental organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
non-profit organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other public sector organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If there was a portal operated by the public authorities providing both public and private sector information and services together, how important do you consider clearly mentioning the provider?

Very Important Important Somewhat Important Not Important

How important do you consider multilingual support?

Very Important Important Somewhat Important Not Important

How important would you see the possibility to offer services for the special user groups such as visually impaired?

Very Important Important Somewhat Important Not Important

How important would you see the possibility to receive user feedback concerning the services provided?

Very Important Important Somewhat Important Not Important

Would you see the future public administration services benefiting from a possibility for user authentication and user personalisation?

Very Much	Much	Not So Much	Not At All
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How important would you see the possibility for user specific customised services related to: navigation, content, application interfaces?

	Very important	important	Somewhat important	Not important
Navigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
application interfaces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What problems might be related to user authentication, user authorisation, user profiling and user personalisation?

How important would you see the support of wireless technologies in the future?

Very Important	Important	Somewhat Important	Not Important
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Standards

How important would you see the role of the standards in the future?

Very Important	Important	Somewhat Important	Not Important
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Would you see your organisation benefiting from using open standards in the future?

Very Much	Much	Not So Much	Not At All
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please name and rank the standards you consider most important

B.4 Public Authorities Questionnaire: Current Situation

General Information

Describe the basic roles at your institution (e.g. official in charge, executive officer, IT manager, tax officer, security officer, etc.)?

Name the basic roles at your department?

Which role have you got within your department?

What are the responsibilities and obligations of your department?

What formal organisational structure(s) exists in your institution? (multiple choice possible)

Strict hierarchy

Partial hierarchy

Teamwork

Taskforce

Matrix

Other: _____

Estimate the percentage of your clientele:

	In terms of processes	In terms of workload (time)
Citizens	%	%
Businesses	%	%
Other public administrations	%	%
Other internal departments	%	%
Non-profit organisations	%	%

Current Situation - Online Services

How long has your organisation been offering online services (via the Internet, mobile telephones etc) ?

.....

.....

.....

.....

Which services do you provide through internet? *(Multiple responses permitted)*

Basic information and guidelines on government programs/policies ?

More detailed information, including government reports

Search Engine?

- Downloadable Forms (applications etc) ?
- Allow feedback?
- Enable the return of email comments ?
- Online submission of data (registering for benefits etc) ?
- Online Payments ?
- Other*

(*) Please specify

What special services are provided (Q&A, FAQ, transaction services, guest book-services, Push-services etc.) ?

.....
.....
.....

How are the results communicated to the citizens?

- 1).....
- 2).....
- 3).....

the companies?

- 1).....
- 2).....
- 3).....

to public organisations?

- 1).....
- 2).....
- 3).....

Name the 3 most popular forms (methods) of access to the services offered by your Organisation for citizens

- 1).....
- 2).....
- 3).....

for companies

- 1).....
- 2).....
- 3).....

for public organisations

- 1).....
- 2).....
- 3).....

How often is the electronic content being renewed/updated ?

- | | | | |
|---------------|--------------------------|----------------|--------------------------|
| Every Day | <input type="checkbox"/> | Every Week | <input type="checkbox"/> |
| Every Month | <input type="checkbox"/> | Every 6 Months | <input type="checkbox"/> |
| Every Year | <input type="checkbox"/> | Other * | <input type="checkbox"/> |
| Event -driven | <input type="checkbox"/> | | |

(*) Please specify

Is there any tracking and tracing and referral information of ongoing service processes?

- Yes No

If yes please explain

.....

.....

Does your current system provide a possibility for user surveys ?

- Yes No

If yes please list some examples of the user surveys used

.....

.....

Have you actively liaised with other agencies to ensure that information on your website is accurate and that duplication of effort is minimised?

- No
- Sometimes
- Usually
- Always

Current Situation -“Life-events”

Definition :“life-event” is an event based on a life-episode such as getting married, being born etc.

Does your organisation offer services in the form of “life-events”?

Yes No

In which areas ? (Multiple responses permitted)

- | | | | |
|-------------------------------|--------------------------|-------------|--------------------------|
| Economy | <input type="checkbox"/> | Health | <input type="checkbox"/> |
| Social Security | <input type="checkbox"/> | Work | <input type="checkbox"/> |
| Transportation & Environment | <input type="checkbox"/> | Education | <input type="checkbox"/> |
| Everyday life (e.g. marriage) | <input type="checkbox"/> | Tourism | <input type="checkbox"/> |
| Building & Housing | <input type="checkbox"/> | Immigration | <input type="checkbox"/> |
| Other (*) | <input type="checkbox"/> | | |

(*)Please specify

For each sector covered by your organisation, name the 5 most popular “life-events” according to the response of your clientele:

Economy

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....

Health

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....

Social Security

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....

Transportation & Environment

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....

Work

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....

Education

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....

Everyday life

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....

Tourism

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....

Immigration

- 1.....
- 2.....
- 3.....

4.....
5.....

Building & Housing

1.....
2.....
3.....
4.....
5.....

Other (as specified in the previous question).....
1.....
2.....
3.....
4.....
5.....

Under which criteria have you decided on offering these particular "life-event" services ?

.....
.....
.....

In what form are the "life-event" services offered (by your organisation)?

Face-to-face Call Centre
Internet Mobile Telephone
TV Information „kiosk“
Other*

(*) Please specify

(Multiple responses permitted)

Please state what percentage of the services are offered via these media types

Face-to-face % Call Centre %
Internet % Mobile Telephone %
TV % Information "kiosk" %
Other %

Please describe the “life-event” services you are offering in each case :

Face-to-face

.....
.....
.....
.....

Call Centre

.....
.....
.....
.....

Internet

.....
.....
.....
.....

Mobile Telephone

.....
.....
.....
.....

TV

.....
.....
.....
.....

Information kiosk

.....
.....
.....
.....

Other

.....
.....
.....
.....

Are there any other services offered by your organisation that could be modeled as “life-events”? Please specify

.....
.....

In what language(-s) are the “life-events” services to be accessed and why ?

.....
.....

Are the provided “life-events” services suitable for people with special needs (handicapped people etc) ?

Yes No

Please specify the special user groups

.....

What is the largest difficulty you had to face while developing your “life-events” services ?

.....
.....
.....

What do you believe is the future of “life-events” services within your organisation? Are you thinking of expanding the “life-events” services model ? Please explain

.....
.....
.....

What are the most common suggestions made by the users concerning the improvement of the “life-event” services ?

.....
.....
.....

At what percentage do users prefer electronic access to services (compared to more “traditional” access methods)?

Citizens %
 Businesses %
 Public organisations %

What is the users’ response to the following statements regarding online “life-event” services?

	Highly Agree	Agree	Neutral	Disagree	Highly Disagree
I am satisfied with online services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I prefer other types of service delivery (face-to-face, call centers etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I believe there is much room for improvement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have problems with technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What are the most common complaints made by the users concerning the “life-event” services ?

.....

Current Situation - Processes

Regarding your Department

What processes do exist in your department and what is/are the respective life-event(s) (if suitable)?

How many percent of the processes are

Fully automated %
 Well structured (highly routinised) %
 Individualised case processing %
 Negotiation process / weakly structured %

Which of these processes are already realised in

Intranet:
 Extranet:
 Internet:

Which ones should be realised in online one-stop government ?

For which processes (or parts thereof) is m-Government (access via mobile devices) feasible from your point of view ?

Detailing Two Processes

Choose two of your most important processes for the following

1. Routine (well structured or automated) process:

2. Individualised case processing or negotiation process:

Routine Process

General aspects

Shortly describe the process and its goals?

What is the necessary input

from clients?

from internal data?

from other public administrations?

from legal resort?

other?

What is the resulting output?

Name the support ing devices you use during the process performance to achieve the result?

Describe the sequence of steps that have to be taken (workflow)?

Who is involved (roles)?

Who (role) is responsible for the results?

Who (role) is making the decisions and who (role) is approving them?

What legal aspects / frames / constraints have to be considered?

Technical aspects regarding the routine process

For this process the following IT-support is used:

Email:

Office-products: _____

Time-Management: _____

Workflowsystem (e. g. ELAK): _____

Enterprise Application System (e.g. SAP,
FabaSoft Components): _____

Database: _____

Internet-Portal: _____

Groupware Tools (apart from email): _____

Networking

Intranet

Extranet

Internet

Others (e.g. proprietary systems): _____

Who maintains the system?

Internal department

External (service provider)

To what extent is the process realised through the intranet / extranet / internet?

Providing information

Email

Communicating

Interaction

Transactions

If transaction: how is the application transfer red from the portal/front-office to the internal processing/back-office?

What security concepts are applied thereby?

Digital signature

Authentication (e.g. approval of sender)

Authentication (approval of content)

Authorisation (e.g. approval of decision maker)

Data Protection (e.g. access regulation to sensitive data)

Secure Transaction (SSL, PKI, etc.)

Other: _____

What kind of files / records have to be kept?

Process history

Incoming documents

Accompanying documents

Resulting documents

Are the records kept

in a database

centralised

decentralised

on paper

other: _____

In what form are the results conveyed to the addressee(s)?

Critical issues and potential improvements concerning the routine process

List specific weaknesses of the process

What informal routines / practices do you apply to speed up / improve the process?

If there is any support that would contribute to an improvement / simplification of the process, please name it:

What support would facilitate / speed up your work in the process?

What structural changes within the organisation would improve the process?

How do you think this process could be adapted for one-stop government?

List the legal provisions which would have to be changed:

What technical support would be needed for that?

Which roles would have to assume new tasks?

What would be your role in the new process?

In which step of the sequence of the one-stop government process are security provisions for secure transactions required?

What are the changes required to realise the government-to-government (G2G) relationship in e-Government in this process (data access, G2G collaboration,...) to achieve co-operation among different agencies/organisations in the process?

Individualised Case Processing / Negotiation Process-General aspects

Shortly describe the process and its goals?

What is the necessary input
from clients?

from internal data?

from other public administrations?

from legal resort?

other?

What is the resulting output?

Name the supporting devices you use during the process performance to achieve the result?

Describe the sequence of steps that have to be taken (workflow)?

Who is involved (roles)?

Who (role) is responsible for the results?

Who (role) is making the decisions and who (role) is approving them?

What legal aspects / frames / constraints have to be considered?

Technical aspects regarding the individualised case processing / negotiation process

For this process the following IT-support is used:

Email:

Office-products:

Time-Management: _____

Workflowsystem (e.g. ELAK): _____

Enterprise Application System (e.g. SAP,
FabaSoft Components): _____

Database: _____

Internet-Portal: _____

Groupware Tools (apart from email): _____

Networking

Intranet

Extranet

Internet

Others (e.g. proprietary systems): _____

Who maintains the system?

Own department (internal)

Service provider (external)

To what extent is the process realised through the intranet / extranet / internet?

Providing information

Email

Communicating

Interaction

Transactions

If transaction: how is the application transferred from the portal/front-office to the internal processing/back-office?

What security concepts are applied thereby?

Digital signature

Authentication (e.g. approval of sender)

Authentication (approval of content)

Authorisation (e.g. approval of decision maker)

Data Protection (e.g. access regulation to sensitive data)

Secure Transaction (SSL, PKI, etc.)

Other: _____

What kind of files / records have to be kept?

Process history

Incoming documents

Accompanying documents

Resulting documents

Are the records kept

in a database

centralised

decentralised

on paper

other: _____

In what form are the results conveyed to the addressee(s)?

Critical issues and potential improvements concerning the individualised case processing / negotiation process

List specific weaknesses of the process

What informal routines / practices do you apply to speed up / improve the process?

If there is any support that would contribute to an improvement / simplification of the process, please name it:

What support would facilitate / speed up your work in the process?

What structural changes within the organisation would improve the process?

How do you think this process could be adapted for one-stop government?

List the legal provisions which would have to be changed:

What technical support would be needed for that?

Which roles would have to assume new tasks?

What would be your role in the new process?

In which step of the sequence of the one-stop government process are security provisions for secure transactions required?

What are the changes required to realise the government-to-government (G2G) relationship in e-Government in this process (data access, G2G collaboration,...) to achieve co-operation among different agencies/organisations in the process?

Current Situation-Technology

Web publishing

Does your organisation have:

an Intranet? Yes No

an Extranet? Yes No

Does your organisation have dynamic or static web pages ?

Dynamic Static Both

Would you regard your content publishing and content management model centralised or decentralised ?

Centralised Decentralised

How are the link lists being updated ?

.....

Data management & metadata

(Definition: In short metadata can be defined as "data about data" or "data describing data resources").

Are you familiar with the concept of metadata?

Yes No

Have you any metadata-related solutions in use?

Yes No

Does your organisation use categories and classifications to sort your documents?

Yes No

If yes, what are these classifications based on ?

.....

Portal

Definition: Portal is a personalised single point of interaction with relevant applications and information.

Is your organisation running a kind of Portal?

Yes No

Are you currently using a Portal Server product?

Yes No

If yes, please name the Portal Server product in use

.....

Do your services communicate with other services?

Yes No

If yes, with which kind of services are your services communicating?

Other public authorities

Companies

Non Profit Organisations

Others

If yes, what are the means of communication?

.....

Does your portal support wireless technologies (PDA, Mobile, SMS etc.)

Yes No

If yes, what wireless technologies are supported ?

.....

Which of the following techniques have been used in your services?

- user authentication ? Yes No
- user authorisation ? Yes No
- user profiling ? Yes No
- user personalisation ? Yes No
- single sign-on ? Yes No
- encryption ? Yes No

Which of the following techniques do you plan to use in future services?

- user authentication ? Yes No
- user authorisation ? Yes No
- user profiling ? Yes No
- user personalisation ? Yes No
- single sign-on ? Yes No
- encryption ? Yes No
- digital signature? Yes No

Standards

How important is supporting standards as an objective for your organisation?

Very Important	Important	Somewhat Important	Not Important
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How well up to standards (i.e. HTML 4.01) would you say your web performance is at the moment?

Fully up to standards Well behind standards

Are all web browsers (IE, Netscape, Opera etc.) equally supported?

Yes No

If no, which browsers are specifically supported ?

.....

What file formats are used on your organisations web site for distributing data?

HTML ?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
PDF ?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
MS Word ?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
WordPerfect ?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
MS Power Point ?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
Rich Text Form at ?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
Rich Text Format ?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
XML ?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>

Other (please specify) :

Other technical aspects

Did you perform programming work to create your services?

Yes No

If yes, which of the following programming means are used?

C / C++	<input type="checkbox"/>	Perl	<input type="checkbox"/>
CGI	<input type="checkbox"/>	PHP	<input type="checkbox"/>
Java	<input type="checkbox"/>	Visual Basic	<input type="checkbox"/>
Java Script	<input type="checkbox"/>	Othe	<input type="checkbox"/>
Java Applets	<input type="checkbox"/>	Java Servlets	<input type="checkbox"/>
Java Beans	<input type="checkbox"/>	Other(*)	

(*) Please Specify:

If yes, which of the following communication techniques are used?

CORBA

HTTP

TCP/IP

Other

Which of the following security techniques are used?

Firewall

IPSec

SSL

VPN

Other

Please state the manufacturer and the type of your server hardware.

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Please state the manufacturer and the version of your server operator system.

.....

Please list the software you are using, especially the Web server, the tools for content and document management, and the tools you use to create and manage your services (e.g. FrontPage).

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