IST PROJECT 2001-35399

A Governmental Knowledge-based Platform for Public Sector Online Services

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Abstract: This deliverable provides a report concerning the project's initial objectives and its overall achievements. Additionally, this document has as a "confidential" appendix the SmartGov Business Plan.

Keyword List: SmartGov, knowledge, platform, e-services, transactional

Project funded by the European Community under the "Information Society Technologies" Programme (1998-2002)

The SmartGov Consortium consists of:

Partner's Name	Acronym	Role	Country
University of Athens	UoA	Project Coordinator	Greece
T-Systems Nova	TNB	Partner	Germany
Indra Sistemas S.A.	Indra	Partner	Spain
Archetypon S.A.	ARC	Partner	Greece
Napier University	NU	Partner	United Kingdom
General Secretariat for Information Systems	GSIS	Partner	Greece
City of Edinburgh Council	CEC	Partner	United Kingdom

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1 Project Overview

1.1 Executive Summary

This deliverable provides a report describing the project's lifecycle. It starts with a brief description of the project main achievements and it gives a small presentation of each of the partners. Next, it proceeds by presenting the project's objectives, the project's technical approach and the project's project management process.

The deliverable continues and describes in detail the project's results and achievements, its scientific/technological quality and innovation, and the SmartGov's Framework for e-government services. The next section presents project management and coordination aspects of the project. The deliverable ends with a section on the outlook of the project results per partner and conclusions.

1.2 Main Project Achievements

The project achievements are:

- The specification and development a knowledge-based core repository for governmental transaction services. This repository contains the basic Transaction Services Elements and Knowledge Units that can be used to build up services.
- The specification and development the SmartGov services and applications for creating and maintaining e-services and for communicating with installed IT systems.
- The development of a Framework for e-Government Services.
- E-Government Services Ontology
- The deployment of the SmartGov platform in one ministry and one local authority and its evaluation by creating public transaction services.

1.3 Consortium Composition

1.3.1 Department of Informatics and Telecommunications at National and Capodistrian University of Athens

The section of Computer Systems and Applications is a research and graduate education unit within the Department of Informatics of the University of Athens focusing on R&D in the area of Multimedia, Data Bases, Distributed Systems, Information Systems Requirements Engineering, Component-Based Architectures and Computer Networks Applications. The Department has formed the e-Government Laboratory (e-Gov Lab), which has set up and administers the first e-Government portal in Greece (www.e-gov.gr)

1.3.2 T-Systems Nova, Berkom

T-Systems Nova was founded in spring 1999 in order to join research groups/subsidiaries and to strengthen the innovative potential of Deutsche Telekom AG. Since 2001 T-Systems Nova is part of T-Systems International GmbH. Within T-Systems, T-Systems Nova is the full-service provider of telematic innovations and for integrating telecommunications systems and information technology. With 5000 employees (scored: June 2001) T-Systems Nova undertakes development and integration work, and offers advices and implementation. Besides several centres for

the development of software and information systems T-Systems Nova has also integrated the well-known research centres "Technologiezentrum" in Darmstadt and "Berkom" in Berlin.

1.3.3 Indra Sistemas S.A.

Indra is the leading Spanish company in Information Technologies (IT). In 1999 the company achieved revenues of 577 million euros (more than 96,000 million pesetas) and a backlog of more than 901 million euros (150,000 million pesetas). The company's activities are divided into three lines of business: Information Technologies, Simulation and Automatic Maintenance Systems, and Electronic Defence Equipment. Indra is an outstanding point of reference on the markets in which it operates, both nationally and internationally. Present in more than 40 countries on the five continents, more than 40% of the company's billing in 1999 came from international activity. This position is strengthened by a network of delegations and permanent offices, allowing the company to acquire sound knowledge of the markets on which it operates, as well as by international agreements and strategic alliances.

1.3.4 Archetypon S.A.

Archetypon S.A. was established in 1987 and was shaped to its present form in 1996. Focused on software engineering services, the company emphasises on testing, quality control and finishing of products. Since its first steps, Archetypon overturns ordinary, common practices by opting a clear-cut exporting orientation, an act that nearly establishes the 100%-base of its activities. The names of its international partners-customers, such as Microsoft, IBM/Lotus and the European Commission clearly reflect the high quality of services provided by the company. The IT Division relies on two main strategic paths: first, the research in emerging technologies and practices that bear the prospects of defining the future shape of things and secondly the provision of applied technology services to international customers that leverage the know-how acquired through R&D. Major sectors that the Division is focusing are:

- Electronic Services to the Citizen (e.g. e-government and tele-medicine)
- Advanced Internet-based electronic commerce solutions
- Multimedia distribution networks
- Provision of integrated services over wireless networks
- Modelling of procurement planning and consulting services
- Integrated workflow solutions
- Applications on mobile appliances

1.3.5 International Teledemocracy Centre at Napier University

Napier University in Edinburgh, Scotland is one of the largest higher education establishments in Scotland with over 11,500 students offering in the region of 150 Undergraduate and 120 Postgraduate courses, with a staffing complement of more than 1,500 staff. It established the International Teledemocracy Centre in August 1999 in partnership with BT Scotland. The International Teledemocracy Centre (ITC) is a multi-disciplinary unit in the Faculty of Engineering and Computing. One of its main objectives is to promote the application of ICT by governments worldwide in order that elected members and supporting staff can conduct their business more effectively and efficiently.

The work of the Centre is described at its web site at www.teledemocracy.org.

1.3.6 General Secretariat for Information Systems, Greek Ministry of Finance

The General Secretariat for Information Systems (GSIS) is a public administration agency of the Greek Ministry of Finance (GMoF) with a mission to:

develop technological infrastructures and manage information content, thereby providing quality services to the citizens and enterprises for all their transactions through the Ministry of Finance

utilize new technologies, introducing innovative and advanced services and products, for the citizens' enterprises' and Public Sector's benefit in Greece and in the European Union

take advantage of the opportunities that create added value to the Greek economy by using the know-how of its human resources

contribute to compliance of the law and facilitates effective, efficient and transparent communication between the citizens and the Ministry of Finance.

1.3.7 City of Edinburgh Council

The City of Edinburgh Council has the local government responsibility for the provision of Education, Social Services, Recreation, Planning, Roads and Transport, Environmental Services and Economic Development for a city population of over 400,000 inhabitants. The City employs approx. 17,500 staff.

The City Council has recently launched a Telematics Strategy for the City. It aims to illustrate the importance of new technologies in the economic and social future of the City. The Strategy has been drawn up by a city partnership, which brings together key organisations from the private, public, community and voluntary sector concerned by or involved in ICT. The delivery of the Strategy is an integral part of the City Plan,

which outlines a joint programme of activity across all sectors and key institutions to achieve a common vision of the City's future development.

List of Participants

Partic. Role*	Partic. no.	Participant name	Participant short name	Country
C-F-S	1	University of Athens	UoA	EL
P	2	T-Systems Nova GmbH Berkom	T-Systems Nova	D
P	3	Indra Sistemas S.A.	Indra	E
P	4	Archetypon S.A.	Archetypon	EL
P	5	Napier University	NU	UK
P	6	General Secretariat for Information Systems – Greek Ministry of Finance	GSIS	EL
P	7	City of Edinburgh Council	CEC	UK

1.4 Roles of Partners

The project features a highly complementary set of partners, which jointly bring all the required expertise and experience to the project.

The **University of Athens (P01)** is the oldest and the largest university in Greece. The university of Athens undertook the **administrative, financial and scientific coordination** and contributed to the investigation of e-forms standards based on XML and the development of the SmartGov platform.

T-Systems Nova (P02) is a research and development company of the Deutsche Telekom Group, Europe's number one in telecommunications. T-Systems Nova provided input for the State of the art in terms of processes and technology.

Indra Sistemas S.A. (P03) is the leading Spanish company in Information Technologies. Indra bases its response on the application of the most avant-garde competitive technologies, belonging to the latest generation, such as Electronic Business and Knowledge Management among others. Indra led the specification and development of the SmartGov knowledge-based platform.

Archetypon S.A. (P04) is one of the 500 of Europe's Most Dynamic Entrepreneurs with significant expertise in electronic government and in the development of value-added services and applications. Archetypon led the dissemination and exploitation as well as the implementation of SmartGov Services and Applications, and contributed to the development of the SmartGov knowledge-based platform.

International Teledemocracy Centre, Napier University (P05) is a pioneer in electronic government in Scotland. The International Teledemocracy Centre is a multi-disciplinary research unit in Napier University. One of its main objectives is to promote the application of ICT by governments worldwide in order that elected members and supporting staff can conduct their business more effectively and efficiently. Napier led the development of a framework for e-Government Services, the development of the eGovernment Services ontology that underpins it, and the evaluation of the SmartGov platform.

The **General Secretarial of Information Systems, Greek Ministry of Finance (P06)** is utilising a number of e-government applications in Greece, e.g. TAXIS for interconnecting all taxation offices in Greece and TAXISnet for online submission of taxes. The Ministry acted as the main trial site for Greece.

The **City of Edinburgh (P07)** is a pioneer local authority in establishing online Web presence. Edinburgh acted as the trial site for deploying and evaluating the SmartGov platform in Scotland.

2 Project Objectives

According to the European Commission[1], transaction services (such as e-forms) although perceived as the future of e-government have not yet realised their full potential. E-forms have a significant role in e-government, as they are the basis for realising most of the twenty public services[2] that all member states have to provide to their citizens and businesses. SmartGov delivers an intelligent e-forms environment and an associated Framework for e-government services.

The aim of the SmartGov project was to specify, develop, deploy and evaluate a holistic approach for online transaction services specific to the public sector. It achieved this by developing a **knowledge-based platform** that assists public sector employees to generate **online transaction services** by simplifying their development, maintenance and integration with installed IT systems. The SmartGov platform is user-friendly, requiring only basic IT skills -besides the necessary domain knowledge- to deploy and manage electronic services, and has been tested in selected public administration application areas.

The project objectives included:

- The specification and development of a knowledge-based core repository for governmental transaction services. This repository will contain the basic Transaction Services Elements (TSE) and Knowledge Units (KU) that will be used to build up the public services.
- The specification and development of the SmartGov services and applications, including
  - **Services** (e.g. SmartGov agent and Information Interchange Gateway) for the communication with other IT systems.
  - **E-services Applications** for the different users of the platform (i.e. IT department, managers and end-users).
  - An **administrative tool** for the knowledge-based repository.
  - The **Dissemination Server** (presentation layer) to support different access channels.
- The creation of a Framework for e-government services.
- The development of an eGovernment Services Ontology
- The successful deployment of the SmartGov platform in one ministry and one local authority.

[1] European Commission, 'Public Sector Information: A Key Resource for Europe', Green paper on Public Sector Information in the Information Society, ftp.echo.lu/pub/info2000/publicsector/gppublicen.doc

[2] eEurope, 'Common list of basic public services', http://158.168.149.15/information_society/eeurope/action_plan/pdf/basicpublicservices.pdf

- The exploitation of the SmartGov platform in the creation of a number of transactional services that were used to evaluate that platform.

An overview of the SmartGov system is presented in Figure 1.

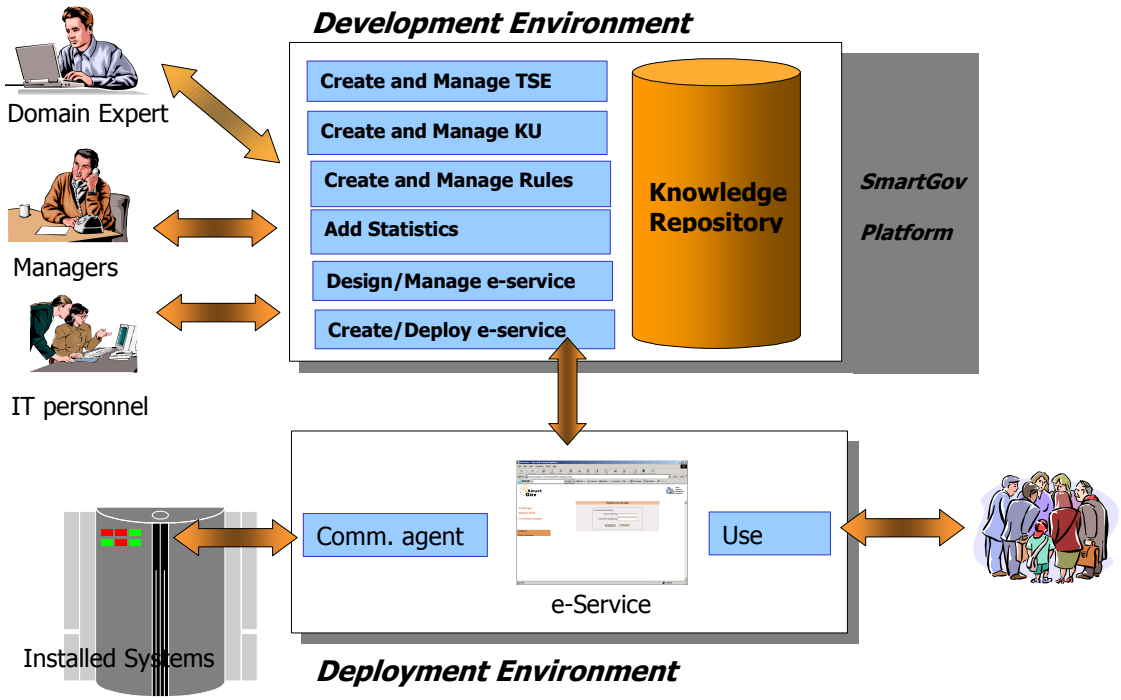


Figure 1. Overview of *SmartGov* system

The project's main result is a development environment, which enables public sector employees in different levels to develop and maintain services for both the citizens and for other public authorities. In such an environment an employee with basic IT skills and the necessary domain knowledge is able to use a predefined form template or create a new form in order to implement a new service or to edit an existing service. At the end of the development procedure the employee is able to activate the service even if the connection to the back-end has not been yet implemented. The SmartGov Agent retains all collected data and once the IT staff implements the connection to the back-end the data will be processed.

Since the e-services contain not only the objects but also the knowledge and the logic associated with them the SmartGov system is able to automatically do simple type checking on the form's data and the developer is able to easily add other more complex validations.

As a result of project activities two pilot systems have been built and installed in two Public Administration Authorities. These authorities include a European Ministry and particularly the General Secretariat for Information Systems at the Greek Ministry of Finance, which is responsible for the national online taxation system and a local authority that of the Edinburgh City Council. For the selected Public Administration Authorities, the SmartGov repository has been populated with the corresponding elements and domain knowledge, according to the methodology specified in the project's implementation phase. During the pilot application phase two services were

developed with the SmartGov platform to verify that all user requirements have been fully and correctly captured and that the platform meets the public administration needs.

3 Approach

In order to achieve the project objectives, the SmartGov consortium adopted an integrated managerial and technical approach based on the experience of the coordinating organisation.

3.1 Project Management

Figure 2 shows the Project management structure. Management responsibilities exist at Project (Project Manager) and workpackage (WP leader) levels. The main management body in the project is the Project Management Committee (PMC), with the day-to-day responsibility being assigned to a Project Manager, nominated by the Coordinating Contractor. In addition coordination roles are defined, as explained in the following.

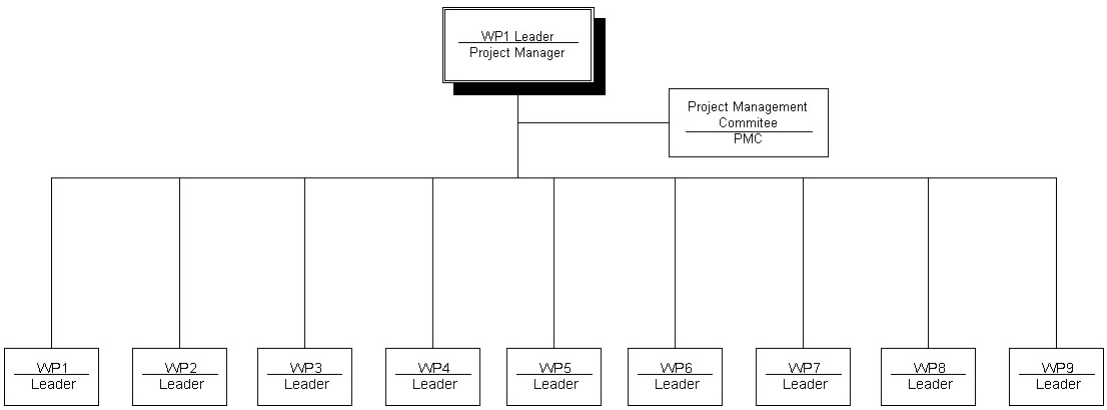


Figure 2 Project Management Structure

3.1.1 Decision process

Project Management Committee (PMC)

A Project Management Committee was established during the kick-off meeting. It consisted of one person appointed by each of the Contractors, each having one vote, and was chaired by the Project Manager. These appointees had senior management responsibility in the Contractor's organisation and had authority to make both technical and administrative decisions on behalf of the respective Contractor. In particular, the tasks of the PMC were:

- Overall technical coordination and management of the Project.
- Maintenance of the relationship with other IST Projects.
- Organisation of Consortium Plenary Meetings.
- Coordination of technical exchanges between WPs.

- Control of Project scheduling and of the achievements.
- Supervision of corrective actions, where needed.
- Approval of the project deliverables
- Production of Periodic Progress Reports summarising the Project progress.

The Consortium normally met at least every three months in plenaries. These meetings were devoted to the coordination of the project from a managerial, exploitation and technical perspective. All active WPs were represented by all involved participants. Occasionally individual WPs decided to meet independently from the plenaries. Depending on specific decisions to be taken, other members of the Consortium (or Project Team?) were asked to participate to the Project Management Committee. The PMC tasks were included in the management workpackage (WP1).

3.1.2 Information flow

Information flow inside the Project was guaranteed through:

- Project planning.
- Technical information and Deliverables.
- Web site and online-forum.

The means the Project circulated such information as:

- Planning and reporting documents.
- Technical contributions originated by the partners and Deliverables.

3.1.3 Reporting procedures

The following main types of deliverables were identified:

- Technical and marketing deliverables, produced in any of the different tasks forming the project. These deliverables could either be implementations or written documents, and were submitted according to the schedule contained in the deliverable list.
- Periodic control reports. These were elaborated and submitted to the EC with the periodicity specified in the contract with the Commission, and at least every three months. They summarised the progress in each reporting period, and contained at least the following information: progress made during the period (tasks finished and submitted deliverables); existing delays (in tasks and/or deliverables) together with the corrective actions that have been adopted; resources spent, compared to the expected, and reasons for deviation (if any).
- A more complete Review Report was elaborated every six months as was specified by the Commission. This report served as a basis for project reviewing.
- Cost claims, which were elaborated according to the Commission rules.

3.1.4 Relationships with the programme

The PMC was responsible for maintaining relationships with the programme, attending coordination meetings and exchanging information with relevant Projects.

3.1.5 Quality assurance measures

Monitoring the advancement of Project studies provided the basis for quality control. This was done by closely following along the time the Workpackage work through the management chain and by approving official project documents at PMC level after they have been agreed by the technical workpackages. Major objections to the acceptance of a Deliverable at one stage would have induced reconsideration of the document at the preceding stage(s).

3.1.6 Risk management

A special task within the Project Management workpackage (WP1) was devoted to the analysis and identification of potential as well as actual risks for the SmartGov project. A Risk Management Plan deliverable was issued as a deliverable at month 6. Continuous monitoring throughout the project was performed by the Project manager, who in some occasions proposed to the PMC corrective actions.

3.1.6.1 Workplan

Work performed within the project was organised in the following WorkPackages:

WP1. Project Management, Coordination and Risk Assessment

WP2. Dissemination and Exploitation

WP3. State-of-the-Art and Current Condition at Public Authorities

WP4. User Requirements and System Specifications

WP5. Development of SmartGov Knowledge-Based Core Platform

WP6. Development of SmartGov Applications and Services

WP7. SmartGov Framework for e-Government Services, and eGovernment Services ontology

WP8. Integration, Deployment and Trials Configuration

WP9. Trials Evaluation

The abovementioned nine WPs provided a detailed workplan that was structured around four main groups. The aim of WPs 1 and 2 was to manage and coordinate the project, to disseminate and exploit its results, to evaluate its progress, to assess the respective risks and to feed the results of risk assessment back to the project. Within WP3 and WP4 the aim was to identify the stakeholders and determine relevant user-groups, obtain their requirements, depict the current condition in participating public authorities and review state-of-the-art including best practice worldwide. Within the context of WP5 to WP7 the implementation of SmartGov system components took place. Centred around the eGovernment Services ontology, new process models were

proposed and relevant social aspects were investigated. Within WP8 and WP9 the SmartGov components were integrated and two trials were carried out in two European countries. In one case the SmartGov platform was installed at a ministry, while in the second case at a local authority. The trials were monitored and the results were evaluated.

3.2 The SmartGov Approach

According to the SmartGov approach the main stakeholders of e-services are:

- Administrators: The public sector employees (normally IT staff and/or clerical workers) that create and maintain e-forms at a technical level.
- Experts: The public sector domain experts who require the e-forms to support their work and who need to collaborate with IT staff during the creation of e-forms.
- Managers: The managers of the public sector who need to take a strategic view of the provision of services, who wish to obtain useful information (e.g. statistics, performance indexes etc.) from e-forms.
- End-users: The end-users (either citizens and businesses or other public sector employees) that have to fill in e-forms.

Currently, these stakeholders have significant problems in adopting e-forms. The main obstacles include:

- Complexity in creating e-forms and, most importantly, difficulty in encapsulating domain expertise in these forms.
- Difficulty in interoperability with existing IT systems within the organisation, and with external IT systems of other organisations.
- Lack of user-friendliness for the end-user in the form of online help, domain specific information, external references, examples, support of multiple access devices etc.
- Lack of value-added, domain-specific services based on the data of e-forms that can be used at a strategic managerial level or to increase domain expertise.
- Lack of mechanisms to encapsulate the knowledge of the organisation as a whole or for transforming implicit knowledge into an explicit form.
- Lack of coherent process models for exploiting the use of public e-services within the public sector.
- Organisational and cultural barriers, such as public sector employees' fear of new technology and new methods of work in the public sector.

The SmartGov showed that most of these problems can be reduced by adopting a **holistic approach** for the introduction of e-forms in the public sector. This approach has two main axes:

- Integrating emerging standards with state-of-the-art technology and with advances in areas such as knowledge management, Web technologies, interoperability and accessibility.
- Introducing this technology in a systematic manner by adopting new process models and process re-engineering and process improving methods.

The SmartGov proposal identifies and addresses three key areas:

- The SmartGov knowledge-based core platform.
- The SmartGov application and services.
- The SmartGov framework for e-government services, including the eGovernment Services Ontology.

3.2.1 The SmartGov approach to Knowledge-based Core Platform

Presently, the domain knowledge used to develop e-services is provided either by means of extra documentation, or implicitly within the application or not at all. As a result, this *implicit* domain knowledge cannot be easily extracted, re-used for developing other services, or modified, when needed. Usually employees rather the organisation possess the critical assets: knowledge and insight. Therefore, the knowledge system must integrate these two assets, by means of encompassing the knowledge and insight that supports the development of electronic transactions.

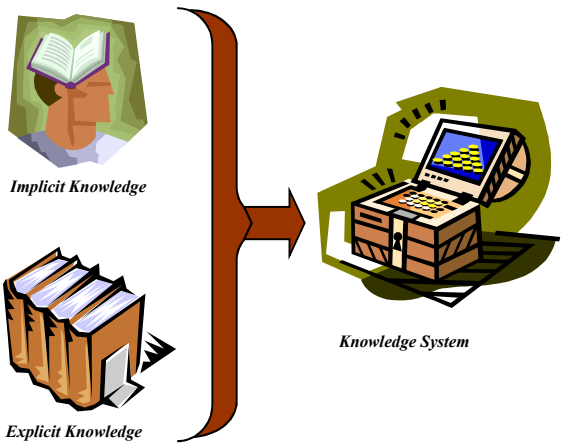


Figure 3. Transferring knowledge to a formalised system

An important aspect of the problem solved by the SmartGov platform is the transfer of the domain knowledge to a formalised system (i.e., DBs, e-forms). This process is illustrated in Figure 3 and includes:

- Knowledge audit
- Knowledge mapping
- Indexing of knowledge content
- Attribution of knowledge content.

In summary, this process aims to extract the knowledge embedded into practices, data, culture, business model and process model, and record it explicitly and formally,

in order to increase performance, leverage best practice and provide effective decision support. The formal process that accomplishes the tasks described above is depicted in Figure 4.

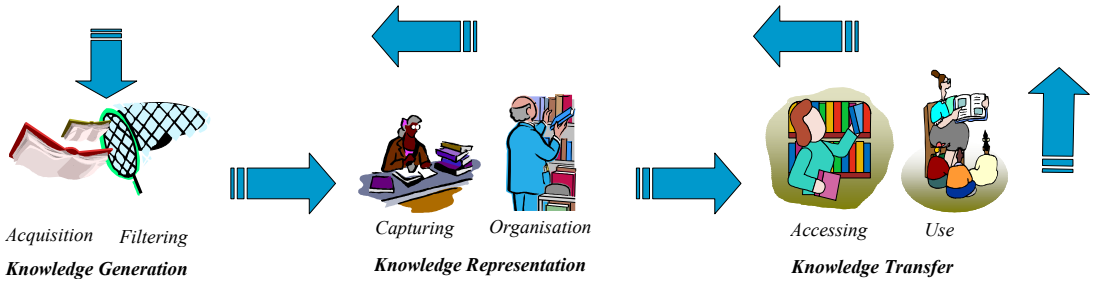


Figure 4. Knowledge generation, representation and transfer

The SmartGov project introduces and incorporates the key notion of the ***transaction service element*** (TSE), which is perceived as the main building block of transaction services. A TSE is the equivalent of a form field (such as the input space for a citizens id number or surname) but also contains metadata and domain knowledge that is attached by the form developer. Metadata may encompass the object's type, range of values, multilingual labels, on-line help, while domain knowledge includes information about the relation of the object to other elements, legislation information etc.

The work towards specifying and developing the SmartGov Knowledge-based platform included:

- The creation of a schema capable of storing and handling the services and the associated web forms, as well as the corresponding knowledge. The schema is expandable and allows for the adoption of new services. The taxonomies skeletal to the knowledge based repository were derived from the ontologies developed in WP07.
- The development of the Transaction Service Elements Knowledge database (SKDB). This includes the essential elements for developing transaction forms along with all relevant information and knowledge. The domain knowledge embedded in installed systems has been used for the development of the SKDB.
- The development of a user-friendly front-end for maintaining the SKDB. This application enables administrating the SKDB in an intuitive, user-friendly manner.

3.2.2 The SmartGov approach to Services and Applications

A Transaction Service (TS), within the SmartGov project, is the equivalent of a form that contains a number of TSEs and some domain knowledge pertaining to the service as a whole. Under this scheme, which is illustrated in Figure 5, in order to develop a transaction service, the following steps must be taken:

1. Selection of the appropriate TSEs to be included within the service.
2. Decision of the layout that will be used to present the service to its users. This layout may be selected from within a standard template library (which may

then be customised); alternatively, any custom layout may be built from scratch.

3. Attachment of rules that govern the service, such as prerequisites for its usage, validation rules, triggering of other services etc.
4. Definition of MIS data and statistics to be captured for further processing.

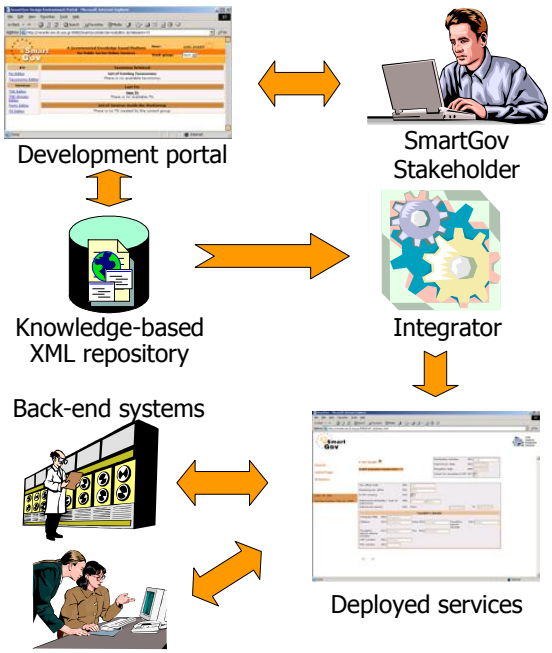


Figure 5. SmartGov development environment

When a service is ultimately deployed to the public, it may need to interact with an installed IT system in order to exchange data with it. All such communication is handled through the communication services that include the SmartGov agent and the Information Exchange Gateway. The **Information Exchange Gateway** publishes an **export schema**, which contains all the data items that need to be accessed by services running within the SmartGov framework. The **SmartGov agent imports** elements published within the Information Exchange Gateway's export schema within the SmartGov environment.

Finally, in all applications the **Deployment Server** handles the presentation layer i.e. all interfaces with the application's users.

When a transaction service has been developed, it may be deployed through the **Integrator**. This component generates automatically a **SmartGov Instance**, comprising of all web pages, forms, information repositories and programs needed to operate the service within the Web environment and deploys it to the designated web server, initiating service operation.

3.2.3 The SmartGov framework for e-government services

For an e-transaction service to be accurately developed and successfully deployed, a framework for e-government services comprising various models needs to be developed. The framework developed addresses 3 important concepts, which are:

- Processes: based on a sufficiently detailed inspection and understanding of current processes, target models for new and rearranged roles and processes have been elaborated.
- Co-operation: models supporting co-operation have been developed. One online form for the end-user can in reality require co-operation by different departments, as well as inter-agency co-operation (*e.g.* local government, health, social security *etc*.) and co-operation with private partnerships.
- Social acceptance: models that support the acceptance of online transaction services, focusing on issues such as privacy, trust and satisfaction, have been developed. Electronic commerce has emphasised contractual trust, and focused on technological issues like security and authentication. Here, we focus on representations of trust and acceptance, taking a more socially oriented approach.

Importantly, the framework is underpinned by the e-government services ontology.

4 Project Results and Achievements

4.1 Scientific/technological quality and innovation

The SmartGov project specified, implemented, deployed and evaluated an integrated, open and extensible platform for creating online, transactional, e-government services. In figure 2 the SmartGov platform overall architecture is presented.

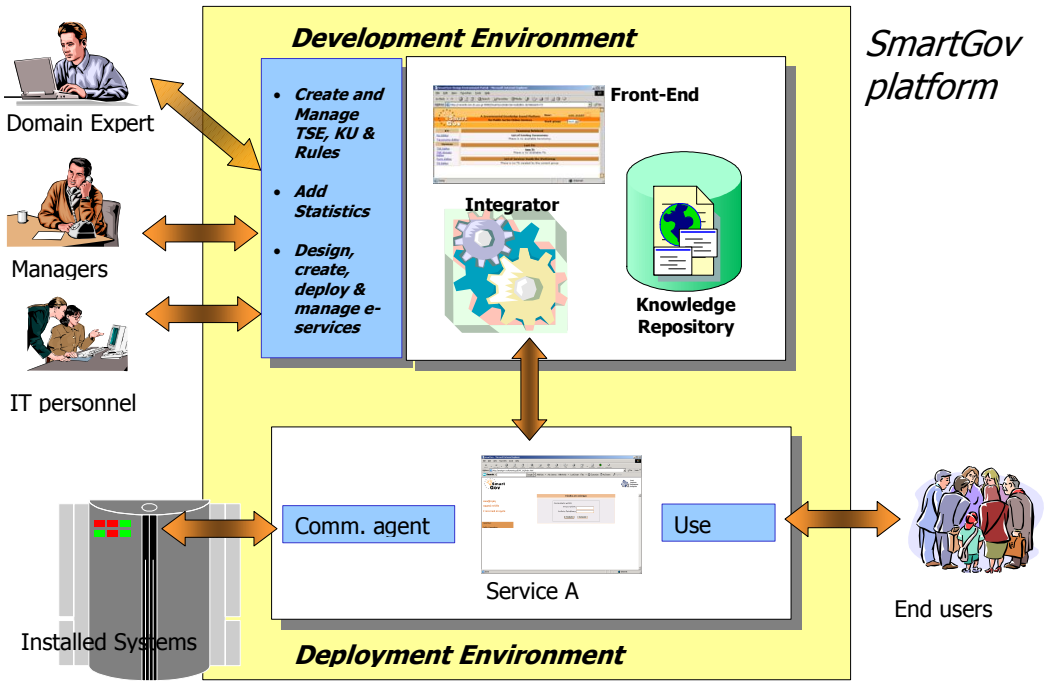


Figure 6: SmartGov overall architecture

The SmartGov project managed to fulfil its original objective for the creation of a knowledge-based platform that assists public sector employees to develop online transaction services.

In the project's scope the following components have been specified and implemented that form the SmartGov platform:

- Knowledge-based repository
- Front-end
- Integrator
- Communication agents for connecting to third-party systems

4.1.1 Knowledge-based repository

This is a general depot for storing organisational knowledge and information pertaining to the transaction services that are developed using the SmartGov platform. In order to provide a semantically rich environment and facilitate extensibility and interoperability, all data is stored in XML format.

4.1.2 Front-end

The SmartGov front-end constitutes of personalised application development environments which are available to the actors involved in the lifecycle of electronic transaction services, namely domain experts, IT staff and managers. The actors employ the SmartGov front-end web interfaces to populate, query and modify the knowledge and transaction services repositories. The front-end offers a wealth of functionality to users, allowing the audited creation, editing, storage, retrieval and deletion of Transaction Service Elements and Knowledge Units. The front-end can be personalised according to the user group privileges to restrict or extend its functionality. The front-end is multilingual and is currently supporting English, Spanish and Greek.

4.1.3 Integrator

The integrator is a software module that reads the contents of the knowledge and transaction services repositories, and automatically generates all necessary elements (files, objects, components etc) for a fully operational transactional service. These elements are then deployed on a dissemination server, initiating service delivery to the users.

4.1.4 Communication agents for connecting to third-party systems

The communication agents comprise of two units, namely the SmartGov agent and the information interchange gateway. This module provides generic communication mechanisms with installed IT systems for the purposes of data exchange, hiding idiosyncrasies and peculiarities of information system platforms and facilitating resilience against temporary failures.

The platform has been installed at the two participating public authorities (General Secretariat for Information Systems – Greek Ministry of Finance (GSIS) and City of Edinburgh Council (CEC)) and has been successfully exploited to built electronic services at these sites. The service built at GSIS is publicly available to all registered users of the Greek Taxation system (www.e-oikonomia.gr), while the CEC version is available to internal users of the Edinburgh City Council.

The SmartGov project's scientific and technological quality lays on its knowledge-based platform and the associated methodology that enable public administration authorities to rapidly design and deploy electronic services. These services can be integrated with the organisation’s installed IT systems, in a manner that maximises system independence and provides ease of maintenance.

The SmartGov project identifies and addresses three main areas of innovation:

- SmartGov knowledge-based core repository: the main innovation is in specifying and implementing a repository with domain knowledge on governmental transaction services. The repository consists of a number of taxonomies that were derived from the eGovernment Services Ontology – also developed as part of the project.
- SmartGov applications and services: the main innovation is in specifying and implementing a set of services and applications that are based on emerging open standards in order to provide different stake-holders with a knowledge-based environment for public e-services that is also integrated with existing IT systems.
- SmartGov Framework for e-Government services, and eGovernment Services Ontology: the main innovations are in investigating and constructing new reference models for the processes behind the design and delivery of e-government services, the co-operation in public authorities, and for both internal and external social acceptance of e-government services.

4.1.5 Other Software Components

Besides the four major software components listed in the previous sub-sections, a number of tools and utilities were implemented within the project scope to facilitat work at various stages of the service development and operation using the SmartGov platform. These components provide added value to the platform and are as follows:

- Document crawler and inverse document crawler. Tools that arrange for exporting data from the XML repository to files and importing files into the XML repository. These tools may be used for backing-up and restoring the XML repository, as well as importing objects created in other platforms to the XML repository, once they have been appropriately formatted.
- DreamWeaver integrator. A tool that creates tag sets for DreamWeaver MX, enabling DreamWeaver MX users to prepare forms to be used for SmartGov services through an intuitive GUI.
- User manager. A GUI-based tool allowing service workers to manage user accounts and service access rights for users of services created using the SmartGov platform.
- SmartGov HTML form editor. An editor allowing its users to write HTML code and embed into it SmartGov tags through simple drag-and-drop actions.
- HTML form generator. A tool that automatically generates HTML forms for SmartGov services. These forms can be used for service testing, or as a starting point for building the actual service forms.

4.2 SmartGov's Framework for e-Government Services

The SmartGov project, through its software platform, aims to minimise the reliance on IT skills to develop e-government services. However, e-government also brings

new styles of communicating, new behaviours, new organisational structures, new processes, new paradigms, new threats and new opportunities.

The SmartGov framework for e-government services includes reference models for:

- the **processes** behind the design and delivery of e-government services
- **co-operation** in public authorities, both internal and external
- **social acceptance** of e-government services

It is intended to benefit any public authority that is planning or already delivering electronic transaction services, whether or not they have access to the SmartGov platform. It is designed to help improve co-operation, effectiveness and efficiency.

The framework is underpinned by the **e-government services ontology**. This is intended to provide a common understanding of the principles of e-government services, an understanding from which people can communicate, discuss and build models of their own.

In building the framework, interviews and workshops within the City of Edinburgh Council and the Greek Ministry of Finance have been used.

The framework is based on the premises that:

- public services **meet the needs** of citizens and businesses;
- public authorities **co-operate** — with the public and private sectors — to jointly deliver services;
- **services** are **constrained** by legislation and resources;
- **better services** are the result of **monitoring** both the quality of services and the satisfaction in services
- the monitoring of **costs** and **benefits** is a key part of the **affordability** and **sustainability** of e-service projects

Recognising that that there is much more to success in e-government than getting the technology right, the framework takes a **sociotechnical** approach, in which the social and cultural aspects of services are described, rather than only the technical artefacts and knowledge of artefacts.

The framework explores the part played by the various roles in the **processes** behind e-services. The main **roles** in e-services are managers, domain experts, IT staff, service workers and end users (the citizens or enterprises that make use of the service). The processes in the **life cycle of e-services** are: identify the service, carry out a feasibility study, prepare the business case, implement, deploy, operate, monitor and improve, and finally discontinue.

Developing e-transaction services requires the establishment of multi-disciplinary relationships in which parties **co-operate**. Many different co-operative structures are possible: internal to public authorities, with other public authorities, with the voluntary sector and with the private sector. There are a handful of different **modes of co-operation** and many different **justifications** for co-operating. Some principles remain the same across all modes of co-operation: be clear about the **shared purpose**; be clear about the justifications; be clear about the **roles**; acknowledge **complexity** and learn to cope with it.

New models of social acceptance based on trust have been developed. The models cover internal trust relationships and external trust relationships. There are significant differences in the models when services become electronic. The modes of trust are latent trust (not context-specific, existing for a long time) and situational trust (context specific, existing for a limited period).

4.3 System testing and trials evaluation

Once the SmartGov platform was installed and operational at the participating public authorities the pre-selected services were implemented in order to evaluate the SmartGov platform. The methods used to conduct this evaluation were; detailed questionnaires, field observation, analysis of operational or managerial data and technical-log data. The evaluation was categorised into three main components:

Technical acceptability: The Platform software was assessed against the user requirements as outlined in deliverable D4.1. Following this response, reliability, compatibility and ease of installation of the platform were specifically evaluated. In the conformance to user requirements analysis it was found that the overall total of user requirements met either fully or partially is 78%, with more than 80% of the compulsory requirements being met. Evaluation of the installation procedure for the SmartGov software noted that as it stands it works well enough, though for some components specialist knowledge is required that may be beyond that which a public authority, IT engineer might reasonably be expected to have.

Usefulness: This was concerned with utility and usability issues relating to how the Platform performed and was perceived by the real users in their native environment. In this a holistic view of the Platform in-situ at the two pilot sites detailing the use of the development environment by the Public Authority Staff to create the online pilot services was taken. The results of this evaluation of platform usefulness were generally positive in that the majority of the success criteria were met, taken across the two pilot sites as a whole. However, there was a disparity between the two sites, which can be seen in the separate results for each site. This disparity was due to the fact that the service developers in CEC had limited IT experience, whereas in GSIS, the individual service developers had a high level of IT expertise. To this end, some useful amendments to the platform were drawn and corrective action was taken.

Social/organisational acceptability: This focussed on a cost benefit analysis of the Platform in order to estimate the overall added value of Smartgov. The cost benefit analysis suggests that the platform can provide added value.

Community added value and contribution to EU policies

According to the European Commission3 “transaction services, such as electronic forms, are perceived as the future of electronic government”. However, in Europe the potential of these services has not been yet realised by the public sector. According to

[3] European Commission, ‘Public Sector Information: A Key Resource for Europe’, Green paper on Public Sector Information in the Information Society, ftp.echo.lu/pub/info2000/publicsector/ gppublicen.doc

the eEurope initiative4 "eGovernment could transform old public sector organisation and provide faster, more responsive services. It can increase efficiency, cut costs, increase transparency and speed up standard administrative processes for citizens and business. Electronic access would also make a major contribution to accelerating the transition to the information society by stimulating Internet services that are more relevant to Europeans. The challenge for administrations is to adapt quickly to the new methods of working and enable new innovative ways of working, including partnerships with the private sector. However this potential is not being realised".

In summary, public administration have so far failed to exploit the benefits of using online transaction services, such as e-forms, in their processes. Although a large number of initiatives have been undertaken at a local, regional or even national level, it is evident that these initiatives have not provided the expected results.

The SmartGov platform shows that an advanced knowledge-based platform for transaction services and particularly e-forms allows the realisation of the potential of these online services.

The SmartGov proposal is inline with EC policies as expressed by the eEurope initiative[2]. More specifically, the SmartGov proposal is expected to contribute to the following two objectives of eEurope:

- **Government on-line: electronic access to public services**

The SmartGov project enables public authorities at all levels (national, regional and local) to exploit new techniques and technologies such as knowledge management, Internet and XML in order to provide electronic public services. This is inline with Lisbon European Council conclusions that call for "*efforts by public administrations at all levels to exploit new technologies to make information as accessible as possible"*. It is expected that the SmartGov project will allow public authorities to achieve the objective set by eEurope 2002, i.e. to provide "*Essential public data online including legal and administrative information*".

- **Participation for all in the knowledge-based economy**

The SmartGov delivers a platform that provides end-user public services accessible by all. This is inline with Lisbon European Council that recognised "*that special attention should be given to disabled people and the fight against info-exclusion."* The SmartGov project follows the principle expressed within eEurope that "*new technologies can often be easier for everyone to use if the usability requirements of all potential consumers are considered from the beginning of the design process.*" For that purpose, design-for-all standards (such as ISO 14307) and the W3C Web Accessibility Initiative (WAI) principles have been followed.

- **SmartGov reduces government expenditures by decreasing bureaucracy**

Using the SmartGov technologies Public Sector Agencies can break down boundaries and reduce transaction costs not only between citizens and their governments but between levels of government as well.

[4] eEurope 2002 An information Society for All Action Plan, 19-20 June 2000, http://europa.eu.int/information_society/eeurope/action_plan/actionplantext/index_en.htm

- **SmartGov brings government services faster, easier and closer to the citizen**

Using the SmartGov platform, public sector agencies can overcome the hurdles imposed by the several factors that until now hindered the widespread adoption of information technologies and embrace technology to create a truly digital government. Those factors included the use of IT legacy systems in operation that require special skills from their operators, a low or complete absence of IT skills of its employees, and finally the 'difficult to find information' problem. The SmartGov platform can help make the government more efficient and responsive to citizens, while at the same time reduce public discontent. Furthermore, it can help revolutionise the relationship between business, government, and citizens—stimulating economic growth and providing dramatically improved services to constituents Europe-wide.

- **SmartGov enables Knowledge Sharing**

More and more, organisations both inside and outside government must share knowledge and information in order to solve problems or deliver services. A continuing wave of public discontent has led to a search for dramatic change in the way government programs are designed, operated, and evaluated. In response, innovative programs have sprung up all around Europe in every domain of public life ranging from economic development to education to municipal services to health care. Information sharing among agencies within government and between government agencies and private and non-profit organizations has clearly become a crucial ingredient in these and other innovative problem solving and service delivery initiatives. This will also stimulate the development of new private sector services based on the new data sources that become available. Thus it will create jobs in value-added services providers.

- **SmartGov creates a better Europe-wide market information**

SmartGov created a "network" by bringing together organisations and companies from all over Europe. The aim of the network is to work together to add value and to build on their individual experiences. Since a European-wide team developed the platform, the results can be extended to any type of Public sector agency, in any member state, and therefore the benefits of it will also be European-wide.

- **Support to interoperability and standards**

The SmartGov platform is based mainly on existing standards and open products and avoided the orientation to proprietary solutions in order to make adaptation easier.

- **Support of EU's language diversity**

The SmartGov catered for the European language diversity offering the possibility to develop dynamic multilingual electronic services. The project created a multilingual platform for the development of electronic forms, where the language can be viewed as one of the form's properties, which the form developers can define. Therefore, the system allows the generation of forms that can be dynamically adapted to the end-user language preferences.

Furthermore, as SmartGov involved the implementation of a leading edge Public Sector Service Creation Environment, it is fully aligned with the Commission policy that encourages innovation, flexibility, and knowledge investments. In SmartGov, the

innovation lies in the provision of not just an IT-based tool, but also in the SmartGov methodology for managing knowledge in public sector online services, i.e. a complete package comprising tools, methods and evaluation of use**.**

4.3 Contribution to Community social objectives

SmartGov contributes to two of the main social objectives set by the European Community: (a) the improvement of the working environment and (b) the development of individual's skills.

SmartGov Contribution to the Improvement of the Working Environment

As pointed out in "*Public Sector Information: A Key Resource For Europe*[5]" there exist considerable practical difficulties for EU citizens to exercise their rights, due primarily to lack of transparency for citizens, employers and administrations at all levels. Furthermore, it is understood that the knowledge required to implement and maintain electronic government services is complex and is rapidly changing. To succeed in developing e-services, the responsibility for the successful creation of new services should not rest solely on technologists, but also distributed to other associated employees[6].

Having as primary objective **the creation of an online knowledge-based platform for public sector** employees at all levels, SmartGov offers the European Public Authorities employees an intelligent platform that supports the development and maintenance of expandable applications. The platform supports both employees concerned with the development of end-user services as well as staff involved in managing the information systems. The system helps integrate electronic services offered by the public authority, which is the number one milestone towards electronic government[7]. The overall contribution to the improvement of the employee's working environment is that it provides a user-friendly system to assist them in their activities.

The SmartGov platform facilitates the maintenance of electronic services by allowing the association of the underlying knowledge to services. To this end, the platform form developers are able to include/link metadata such as the form object's type, range of values, multilingual labels and on-line help, domain knowledge such as information regarding the relation of the object to other elements, information relating to national and European Union's legislation etc.

Furthermore, considering the need for developing electronic services for all citizens the proposed platform will enable the creation of services that adhere to design-for-all standards (such as ISO 14307) and to the W3C Web Accessibility Initiative (WAI) principles, as well as services that support the language diversity of Europe in a consistent and unified manner.

SmartGov Contribution to Development of Individual's Skills

5 http://www.cordis.lu/econtent/publicsector/gp-index.html

6 Eight Imperatives for Leaders in a Networked World, available at http://www.ieg.ibm.com/ thought_leadership/eightImperative.pdf

7 Janet Caldow, Seven E-Government Leadership Milestones, Institute for Electronic Government, IBM Corporation available at: http://www.ieg.ibm.com/thought_leadership/ Seven_E-Gov_Milestones.pdf

The proposed project encourages the development of new skills for the public sector employees. The experience gained from e-government in countries like United States, Australia and Canada shows that the expertise of the government's people[8] is the prime contributor to the provision of better services to citizens and businesses.

The creation of an electronic service requires from the public sector employees a large set of new skills. The SmartGov project reduces the effort required to use the new technology, **to enable employees at all levels to exploit the data and domain knowledge** and to alleviate the problems generated by the need of developing new electronic services in less time. The environment helps employees who are presently not involved in the new technologies, to acquire and enhance their skills, by getting engaged in the development process of electronic services.

4.4 Economic development and S&T prospects

The Project addresses a very well known, defined and realistic problem, providing a realistic solution that is not only commercially viable but also extremely promising from an exploitation of results point of view. The SmartGov project featured a good combination of industrial and academic/research partners, which provided excellent possibilities to adequately exploit and disseminate the results of the project. All partners alike were faced with an opportunity to strengthen their positions in their respective operational, scientific or business, areas.

The SmartGov platform has been deployed and tested in a real-life environment, that of the Public Authorities. The SmartGov project results can deliver major enhancements to the quality of Public Authorities' e-services and the corresponding business processes by increasing their generalisation and repeatability, transparency and potential to retrace, effectiveness and efficiency.

Based upon the experience of the project's trials, the platform is being further developed and fine-tuned towards a commercially usable product that copes with public customers requirements and serves as central solution basis, when Public Authorities increasingly deploy knowledge management concepts in their government projects. In parallel the user acceptance of the developed services will be assessed, since this is a very important factor for the establishment of later platforms for other Authorities.

In addition, the various components developed in the SmartGov project can be a sound foundation for either continued development towards a ready-made product, that can be used on a stand-alone basis; or for internal company products and solution modules, that serve as building blocks or key contributions for a requirements fulfilling solutions in complex and comprehensive customer specific projects. Similarly, the project's organisational results and social aspects studies can enable the creation of consulting modules and services, which efficiently support suitable introduction and deployment at the customer's site.

Finally, during this project several issues have be raised for further research and development. The following table summarises the products that each partner will be

8 Deloitte & Touche (2000). At the Dawn of e-Government: The Citizen as a Customer.

independently exploiting, as well as the main market(s) to which those products are targeted.

Partner	***Product***	***Market/Customers***
University of Athens	Consulting in e-government Services	Research Communities and Public Administrations
T-Systems Berkom	- Enhanced Service Portfolio for e-Government Market - Consulting in e-government Services	Public Administration, mainly in Germany In addition, system integrators and solution providers, that are owned by public administration
Indra Sistemas S. A.	Integration of Knowledge Management Platforms	Public Administrations in Spain (National and 17 regional) and South America
Archetypon S.A.	- Knowledge Management Solutions & Services - Solutions for e-Services to the Citizens	Greek Public Authorities, Commercial Solution Providers, Value Added Resellers of KM Platforms
Int. Teledemocracy Centre, Napier University	- Social Aspects of e-Services - European government Work Practice - - eGovernment Services Ontologys	Research Communities and Public Administrations
GSIS, Ministry Of Finance, Greece	- Implementation and Assessment of new Service Creation Environment - eVAT Forms	-
City of Edinburgh Council, UK	- Implementation and Assessment of new Service Creation Environment - Equipment ordering process	-

5 Deliverables and Other Outputs

5.1 Deliverables List

The project's deliverables names along with a short abstract follow:

- **D11 Project Presentation**

Abstract: This Deliverable provides a presentation of the projects, its technical approach and its expected results.

- **D31 State-of-the-Art and Current Situation at Public Authorities**

Abstract: This Deliverable provides the results of a research aiming to determine and present the relevant state-of-the-art. It includes a presentation of e-forms products and solutions, process models, best practices and knowledge management aspects all related to the public sector. Furthermore the current situation at the participating public authorities is presented in terms of services provided, policies and infrastructure and technologies used.

- **D12 Assessment, Evaluation, Risk and dependencies analysis**

Abstract: The overall assessment, evaluation, risk and dependencies analysis of the project. One of the basic tasks of WP01 is the overall assessment and evaluation of the project as well as the identification and management of all potential risks that may arise in the course of the project. To this end two methodologies have been selected to aid the processes of evaluation and of risk assessment that of Peer reviewing and a Strengths, Weaknesses, Opportunities & Threats (SWOT) Analysis

- **D21 Dissemination and Use Plan**

Abstract: This Deliverable outlines the dissemination and exploitation plans for the SmartGov project.

- **D41 User Requirements, Services and Platform Specifications**

Abstract: This Deliverable provides the results of the analysis of user requirements conducted and the system specifications derived from the obtained results. For the collection of user requirements a number of potential services were analysed for both user organisations participating in the consortium and the results were then consolidated into a single requirements database. The documented requirements have been expressed in terms of systems objectives, which were then mapped to a set of system interoperable components and services, comprising thus the SmartGov platform architecture.

- **D51-D61 Low-level Specifications of SmartGov Knowledge-Based Core Platform & of SmartGov Services and Applications**

Abstract: This deliverable constitutes the Software Architecture Document of the SmartGov platform. It is a holistic approach and reports the outcome of the analysis and design phase of both the SmartGov services and applications as well as the Knowledge based components.

- **D52 Implementation of SmartGov Knowledge-Based Core Platform**

Abstract: This deliverable constitutes the implementation report of WP5. It presents the implementation details of the SmartGov Front-End developing environment.

- **D62 Implementation of SmartGov Services and Applications**

Abstract: This deliverable constitutes the implementation report of WP6. It presents the implementation details of the following components: Integrator, SmartGovLang Translator, SmartGov Agent and SmartGov Information Interchange Gateway.

- **D71 The SmartGov Framework for e-Government Services**

Abstract: This document presents the SmartGov framework for e-government services and eGovernment Services Ontology. The framework for e-government services includes a complete description of the ontology and reference models for:
· the processes behind the design and delivery of e-government services
· co-operation in public authorities, both internal and external
· social acceptance of e-government services

- **D81 Trials Configuration and Evaluation Process**

Abstract: After the integration and deployment done in WP8, a testing framework is set up to assess the SmartGov platform. The aim of D81 is to describe the SmartGov trials configuration and the evaluation process framework that is applicable for the assessment. Thus it introduces real scenarios and use cases for the pilot services that are run in CEC and GSIS.

- **D82 User Guide**

Abstract: This deliverable constitutes the user guide for the tool developed in WP5 and WP6. It explains how to use the SmartGov Front-End developing environment and the way to deliver and maintain services.

- **D91 Evaluation of project results**

Abstract: This deliverable describes the work undertaken in WP09 of the SmartGov Project, and concerns the evaluation of the SmartGov Platform. The methods used to conduct this evaluation are; detailed questionnaires, field observation, analysis of operational or managerial data and technical-log data. The structure of the evaluation was based upon the framework developed in deliverable D8.1.

- **D22 Technology Implementation Plan**

Abstract: This deliverable describes the intentions of all SmartGov partners related to the products and knowledge generated under the project. The deliverable is submitted electronically.

- **D13 Final project report**

Abstract: This deliverable provides a report concerning the project's initial objectives and its overall achievements

The list of deliverables follows:

Del. no.	Deliverable name	WP no.	Lead participant	Estimated person-months	Del. type*	Security**	Delivery (project month)
D11	Project Presentation	1	P01	3	R	Pub.	2
D31	State-of-the-Art and Current Situation at Public Authorities	3	P04	32	R	Pub.	4
D12	Assessment, Evaluation, Risk and dependencies analysis	1	P05	20	R	Rest.	6
D21	Dissemination and Use Plan	2	P02	11	R	Rest.	6
D41	User Requirements, Services and Platform Specifications	4	P01	35.5	S	Pub.	6
D51	Low-level Specifications of SmartGov Knowledge-Based Core Platform	5	P03	19	S	Rest.	12
D61	Low-level Specifications of SmartGov Services and Applications	6	P04	21	S	Rest.	12
D52	Implementation of SmartGov Knowledge-Based Core Platform	5	P03	28.5	R	Pub.	15
D62	Implementation of SmartGov Services and Applications	6	P04	38.5	R	Pub.	16
D71	The SmartGov Framework for e-Government Services	7	P02	32	R	Pub.	16

Del. no.	Deliverable name	WP no.	Lead participant	Estimated person-months	Del. type*	Security**	Delivery (project month)
D81	Trials Configuration and Evaluation Process	8	P03	21	R	Pub.	18
D82	User Guide	8	P03	12.8	R	Pub.	18
D91	Evaluation of project results	9	P05	43	R	Pub.	24
D22	Technology Implementation Plan	2	P02	20	R	Rest.	24
D13	Final project report	1	P01	10	R	Pub.	24

** A short, self-evident description e.g. report (R), demonstration (D), conference (C), specification (S), prototype (P)…*

***Int. Internal circulation within project (and Commission Project Officer if requested)*

Rest. Restricted circulation list (specify in footnote) and Commission PO only

IST Circulation within IST Programme participants

FP5 Circulation within Framework Programme participants

Pub. Public document

5.1 Additional documents

In addition to the deliverables two more documents were created to help the SmartGov platform users:

SmartGov Illustrated

Abstract: This document can be used as a tutorial about creating a simple electronic service using the SmartGov Platform. It describes in a sequence of simple steps the design, creation and deployment of a one form electronic service. It is a good starting point for domain experts and IT staff to familiarise themselves with the platform.

Database connectivity for SmartGov services

Abstract: In this document, database connectivity for SmartGov services is exemplified through a simple service, in which a citizen declares the car (s)he owns. The rest of the document is organised as follows: in section 2 the car declaration service is described and the structure of the registry and document storage table is outlined; in section 3 the method for retrieving registry values to create pre-populated documents is detailed. Finally, in section 4 the method for storing submitted documents to a database is illustrated.

5.2 List of Scientific Publications

The SmartGov project produced the following peer-reviewed publications:

- **A Governmental Knowledge-based Platform for Public Sector Online Services**, P. Georgiadis, G. Lepouras, C. Vassilakis, G. Boukis, T. Tambouris, S. Gorilas, E. Davenport, A. Macintosh, J. Fraser and D. Lochhead, *Proceedings of the 1st International Conference on Electronic Government-EGOV 2002, pp. 362-369*.
  Abstract

  > Public transaction services (such as e-forms) although perceived the future of e-government have not yet realised their full potential. E-forms have a significant role in e-government, as they are the basis for implementing most of the twenty public services that all member states have to provide to their citizens and businesses. The aim of the SmartGov project is to specify, develop, deploy and evaluate a knowledge-based platform to assist public sector employees to generate online transaction services by simplifying their development, maintenance and integration with already installed IT systems. This platform will be evaluated in two European countries (in one Ministry and one Local Authority). This paper outlines key issues in the development of the SmartGov system platform.

- **SMARTGOV: A Governmental Knowledge-based Platform for Public Sector Online Services**, E. Tambouris, G. Boukis, C. Vassilakis, G. Lepouras, S. Rouvas, R. Canadas, S. Heredia, J. C. Lopez Usero, *Proceedings of the KMGov2002 Workshop, Copenhagen, Denmark, May 23-24, 2002, pp. 173-185*.
  Abstract

  > Public transaction services (such as e-forms), although perceived the future of e-government have not yet realised their full potential. E-forms have a significant role in e-government, as they are the basis for realising most of the twenty public services that all European Union member states have to provide to their citizens and businesses. The aim of this paper is to present a knowledge-based platform to assist public sector employees to generate online transaction services by simplifying their development, maintenance and integration with already installed IT systems.

- **Towards an Ontology for Electronic Transaction Services**, Nick Adams, John Fraser, Ann Macintosh and Andy McKay-Hubbard, Tomas Pariente Lobo, Pablo Fernandez Pardo, Rafael Canadas Martinez and Jesus Sobrado Vallecillo *Proceedings of ES 2002, Cambridge, UK, December 2002*
  Abstract

  > In this paper we present an ontology for transaction services built upon an established ontology for corporate knowledge called the Enterprise Ontology. We introduce the SmartGov platform for the 'Smart' deployment of online services for Public Authorities (PAs) whose requirement of a model of PAs has motivated the ontology, and describe our approach to constructing it. After presenting the ontology we then relate it to the pilot application areas in which the SmartGov platform will be trialed and evaluated.

- **Knowledge Management Applied To E-Government Services**, John Fraser, Nick Adams, Ann Macintosh and Andy McKay-Hubbard *Proceedings of the KMGov2003 Workshop, Rhodes, Greece, May 2003*
  Abstract

  > This paper is about the development and use of an ontology of e-government services. In it, we identify the knowledge required to deliver e-government transaction services at different stages of maturity. Based on the SmartGov project, we describe the use of a domain map to assist in knowledge management and motivate the use of an ontology as a domain map. We describe the development of the e-government service ontology and give a few examples of its definitions. We explain why the SmartGov project has adopted taxonomies, derived from the ontology, as its domain map. We highlight issues in ontology development and maintenance.

- **E-forms services for the Public Sector: Shifting Development Effort to Domain Experts**, Stelios GORILAS, Kostas VASSILAKIS, Tomαs Pariente LOBO, Efthimios TAMBOURIS *e-Challenges 2003, Bologna, Italy, October 2003*
  Abstract

  > E-forms have a central role in a significant number of e-government services. This paper presents a knowledge-based technical platform aiming to assist public sector employees to generate online transaction services by simplifying their development, maintenance and integration with installed IT systems. At the heart of this platform lies the knowledge and transaction services repository. This repository consists of a number of XML document types that incorporate all necessary details for creating and managing online transaction services. The main underlying idea is to provide a platform with intuitive interfaces that can be used directly by domain experts thus minimising the need for personnel with IT skills. This platform is currently under development within the IST SmartGov project.

- **SmartGov: A Knowledge-Based Design Approach to Online Social Service Creation**, Adams, N.J., Haston, S., Macintosh, A., Fraser, J., McKay-Hubbard, A. and Unsworth, A. *in Bramer, M., Ellis, R., Macintosh, A; (eds.). 'Applications and Innovations in Knowledge-Based Systems and Applied Artificial Intelligence XI'; Proceedings of AI-2003 the 23rd Annual International Conference of the British Computer Society's Specialist Group on Artificial Intelligence ; Peterhouse College, Cambridge, UK, 16th-17th December, 2003*

  Abstract

  This paper covers the work of the SmartGov project, a collaborative project funded by the European Commission under their Information Society Technologies (IST) 5th Framework Programme, as it has been piloted in the Social Work Department in the City of Edinburgh Council.

  The most significant innovation of the SmartGov platform, which sets it apart from other recent online service implementations for Public Authorities is its use of the e-government ontology. This enables the staff at the Public Authority to record and categorise expert knowledge that they have accrued about service provision so that it can be disseminated among staff, and where applicable selected knowledge can be made available to the users to assist in their completion of online forms and use of the service. The application described in this paper applies knowledge management techniques using knowledge units and an e-government ontology, to develop and deliver an assessment system for the supply of equipment and adaptations. We describe the building of the SmartGov platform, then detail the deployment in the Equipment and Adaptations service. Finally we consider the performance and evaluation measures for the application.

- **Conventional and Electronic Service Delivery Within Public Authorities: The Issues And Lessons From The Private Sector**, Adams, N., Haston, S., Gillespie,N. and Macintosh, A. *DEXA 2003, the 2nd International Conference on Electronic Government - EGOV 2003; Prague, Czech Republic, September, 2003*

  Abstract

  In this paper we compare and contrast the issues of providing conventional against electronic services within Public Authorities (PAs). We present a model suggesting the three dimensions to electronic service delivery are motivation, organisation, and technology (the MOT of service delivery). We observe that the motivations affecting service delivery differ greatly between PAs and commercial organisations, with PAs having certain obligations and responsibilities as to the services that they provide that do not constrain commercial companies. We argue that technologically many lessons learned by commercial organisations can be immensely valuable to

PAs, and conclude that the key barrier to effective electronic service delivery within PAs is their culture and organisation.

- **Models of Trust for Knowledge-based government services**, McKay-Hubbard, A. and Macintosh, A. *DEXA 2003, the 2nd International Conference on Electronic Government - EGOV 2003; Prague, Czech Republic, September, 2003*
  Abstract

  This paper draws on current research and from it isolates a framework of trust definitions. From these definitions models of the trust relationships specific to the implementation of knowledge management within a governmental organisation are developed. As a foundation for the paper we address the nature of knowledge, adhering to current accepted definitions of tacit and explicit knowledge, while introducing a third knowledge type - obscured explicit knowledge. We argue that this third type is a subtype of explicit knowledge, and has been misidentified as tacit knowledge. We also argue that this third type is fundamental to the models. We argue that social acceptance of knowledge management is fundamentally based on trust and subsequently develop the models that describe the complex trust relationships involved in this acceptance.

- **Integrating e-Government Public Transactional Services in the Public Authority Workflow**, Costas Vassilakis, George Lepouras, Stathis Rouvas, Panagiotis Georgiadis *Electronic Government J., vol. 1, Inderscience Publications, 2003*

  Abstract

  Documents submitted by citizens through electronic services deployed in the context of e-Government must usually undergo processing by some organisational information system, in order to complete the citizensÁ requests and for the reply to be returned to the citizen. The integration, however, of the e-service delivery platform and the organisational information system is often hindered for a number of reasons, including security considerations, platform diversity or idiosyncrasies of legacy information systems. In this paper we present a generic method for providing seamless communication between the two platforms, enabling the full integration of documents submitted through electronic services into the organisational workflow, leveraging thus the quality of services offered to the citizens and facilitating e-service development and operation.

5.3 List of Conferences and Workshops attended

The SmartGov partners participated in the following events:

- 1st International Conference on Electronic Government-EGOV 2002

- KMGov2002 Workshop, Copenhagen, Denmark, 2002
- ES 2002, Cambridge, UK, 2002
- KMGov2003 Workshop, Rhodes, Greece, 2003
- e-Challenges 2003, Bologna, Italy, 2003
- AI-2003 the 23rd Annual International Conference of the British Computer Society's Specialist Group on Artificial Intelligence ; Cambridge, 2003
- DEXA 2003, the 2nd International Conference on Electronic Government - EGOV 2003; Czech Republic, September, 2003
- 3rd Cluster Concertation Meeting by the European Commission (domain: Smart Government), Cagliari, 29-30 May 2002

5.4 Other Dissemination Activities: Press coverage, development web sites, etc.

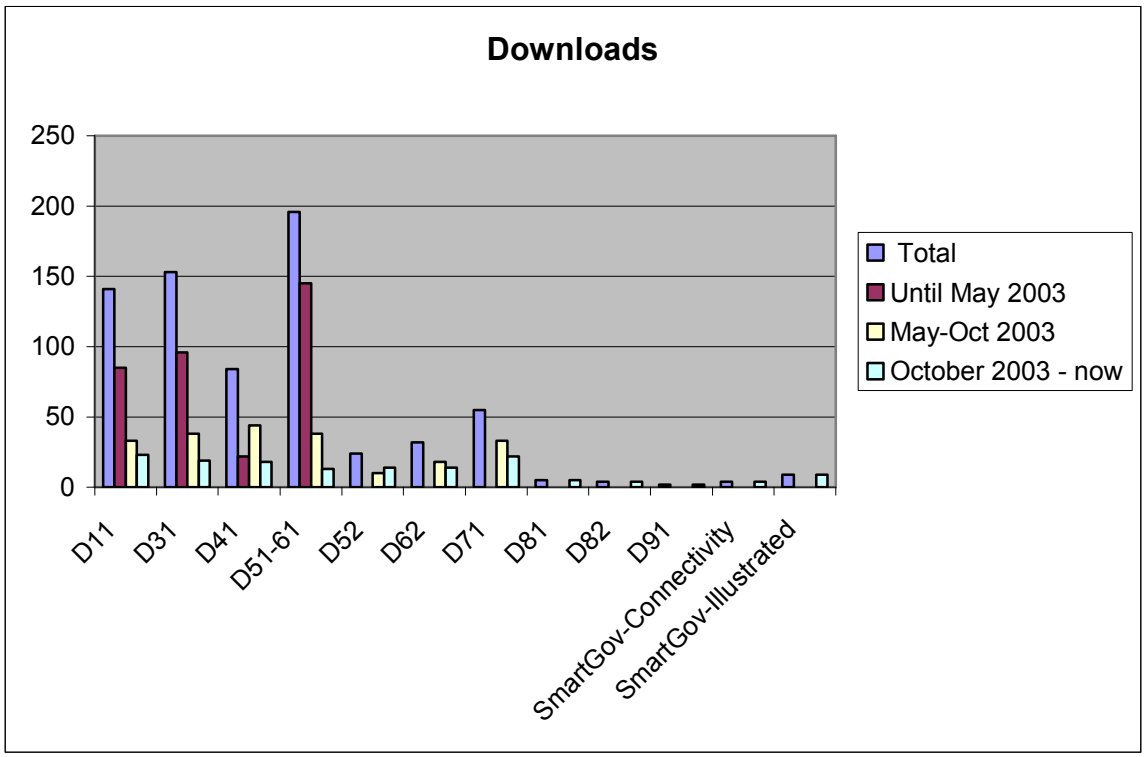
Other dissemination and promotion activities included:

- The SmartGov logo.
- The SmartGov Website at the address www.smargov-project.org. It should be noted that the site name has been reserved for three years.
- Two SmartGov leaflets (basic information / advanced and more detailed information) available in English, German, French and Greek.
- The SmartGov poster.
- The SmarGov briefcase including a coloured A4 handout summarizing the SmartGov project. The briefcase can be individually personalized and equipped with business cards, CDs, or any other information the partners wish to use.
- The SmartGov CD presenting all major aspects of the project.

5.5 Download Statistics

The section presents numbers and qualitative information about those who have requested to download deliverables from the web site. So far a number of visitors have downloaded project deliverables from the web site. The most downloaded deliverables are D51-61, D31 and D11. After May 2003 there also exists a registering facility, which can be used by users downloading deliverables to register their contact details. The following table summarises downloads per time period (prior to registering facility, prior to October review, after October review).

Deliverable	Total	Until May 2003	May-Oct 2003	October 2003 - now
D11	141	85	33	23
D31	153	96	38	19
D41	84	22	44	18
D51-61	196	145	38	13
D52	24	0	10	14
D62	32	0	18	14
D71	55	0	33	22
D81	5	0	0	5
D82	4	0	0	4
D91	2	0	0	2
SmartGov-Connectivity	4	0	0	4
SmartGov-Illustrated	9	0	0	9



The following is a short list of companies and institutions that have downloaded deliverables.

- eGov.pl (Polish e-Government team)

- CenPRA (Brazilian Government)
- Brisbane City Council
- Municipality of Thessaloniki
- TSG Group (Multinational company)
- Syntegra (Multinational company)
- Meltom Technologies (Multinational company)
- Melange Information Services (US-based company)
- SARK systems (India-based company)
- Chinakm (Company)
- Grupo Stela (Brazilian company)
- Pouliadis Associates Corporation
- Intracom (Multinational company)
- Netconsulting (Italian company)
- Univ. of Crete / ATLANTIS Group
- Universidade de Sao Paulo

A total of 60 distinct companies and institutions have so far registered their download.

It has also to be noted that since the beginning of February 2004 the development environment has been made available to visitors of the web site. So far 17 users have tried the development environment.

6 Project Management and Coordination Aspects

6.1 Project Co-ordination activities

The Project management has ensured the achievement of all goals set in the Technical Annex of the Project.

General co-ordination and technical leadership have been effective. The calendar of meetings has been accurately planned in advance and definitely respected. All meetings have run according to agenda, and have achieved the prefixed goals. All meetings have been followed by reports (minutes) with clear actions for all attendees.

No deliverables were overdue at the date of release of the Annual Review Report.

Organisation and chairing of Project meetings:

The coordination activities were started as planned at the Project kick-off meeting (March 2002). During the project's lifetime, the Project's Management Committee (PMC) met on 14 occasions in the framework of Project meetings and workshops or during pre-review meetings (6, 7th June, Edinburgh, 25, 26 July, Athens, 12, 13 September, Madrid, 4,5 November, Madrid, 28,29 November, Athens, 17, 18 February 2003, Edinburgh, 21, 22 April 2003, Brussels, 31 June, 1 July 2003, Athens, 2, 3 October 2003, Edinburgh, 21, 22, 23 October 2003, Bologna, 18, 19 December, Spain, 26, 27 January, Greece).

Internal documentation standards and communications means: Good provisions have been made, with respect to internal documentation standards and communications means. These have been agreed in the Project kick-off meeting and reported in a document named "Organisational Aspects" prepared by the Scientific Coordinator.

- *Internal documentation standards.* Microsoft Office has been adopted as the common platform for word/spreadsheet processing format for document exchange. Project-specific Word "Templates" were created by the Scientific Coordinator for the benefit of all the Partners. Furthermore, naming conventions for all electronic documents were proposed by the Coordinator and adopted by the consortium.
- *Communication means*. The Project has established a good information infrastructure. Email exploders were established by all participants (i.e. smartgov@partner.com) while a number of email exploders was also created and maintained by the Scientific Coordinator (e.g. partners@smartgov-project.org, wp01@smartgov-project.org etc.). Furthermore, the web site, hosts an electronic library/repository of all material generated in the Project and of other relevant external literature and provided facilities for uploading files. Finally, the restricted area of the web site provided apart from the file repository access to a mail repository and a current action list page.

Effectiveness of cooperation among Partners: The cohesion of the working team has been quite high. The level of participation at Project plenary meetings has been excellent. Generally, the members of the SmartGov team have kept the commitments taken. In most cases, the Project could rely on timely contributions to key topics.

Assessment of Effort Expenditure: As some partners have been putting human resources above planned budget in overall there has been minor overspending.

Exploitation Plans: Partners have been constantly stimulated to work out Project dissemination and exploitation plans. These have been pushed up to point of indicating possible "products" suitable for marketing in the short-medium term future after Project completion.

Self-Assessment and Evaluation: Within the SmartGov project lifecycle, main risks were identified. For each risk the probability of occurrence, the possible impact and the resulting risk factor was ascertained. For each risk also measurements for reducing the probability or impact were elaborated. In addition for each risk measurements if a risk happened nevertheless were listed in advance. In addition to the above mentioned “systematic risk management process” (that forms the core of the risk management) other measurements also have been carried out in order to firm up the assessment and evaluation methodology. In that respect:

- A detailed description of the SWOT analysis has been carried out and reported
- A Peer Review Process was introduced to improve the quality of SmartGov deliverables

6.2 Problems encountered, Project Workplan and changes

During the project’s lifetime, some changes took place that were reflected in a Contract Amendment:

> TNB was not able to allocate the effort planned, due to internal re-organisation. All partners worked together (with the project officer's support) in order to re-allocate work and avoid any further delays. There was a shift of the work from TNB to other partners. A number of person-months were shifted from WP4 (User Requirements and Systems Specifications to WP5 and WP6 to be used for low-level specification and systems design. Person months have been added to WP7, which apart from covering the process models, business models and social aspects, it also develops a framework that encapsulates them. The total budget remained the same. Technical Coordinator was changed from T-Systems Nova to University of Athens. WP2 Leader was changed to Archetypon (T-Systems Nova originally). WP7 Leader was changed to Napier University (T-Systems Nova originally).

Other changes per partner:

UoA

Change of Contact Person

CEC

Change of Authorised Administrative Official

Change of Subcontractor and nature of link

7 Outlook

7.1.1 University of Athens

The Department of Informatics and Telecommunications, and especially the laboratory of electronic government (e-Gov lab) intends to exploit the results of the project to provide a number of advanced research opportunities for postgraduate and postdoctoral researchers as well as to strengthen its position in the research on various technical, functional and operational issues related to e-government. The e-Gov lab already offers consulting services, and the SmartGov project has helped in accumulating considerable and state-of-the-art know-how in the area of Knowledge Management with application to electronic government services, reinforcing its position in the this research area. The project has also helped to foster the lab's cooperation with other research centres, enhance the lab's presence in national and international conferences and offer a number of tutorials and advanced courses on the subject.

E-Gov lab plans to play a key role as a scientific consultant in supporting Greek Public Authorities in their effort to create advanced eGovernment services and the SmartGov platform can significantly strengthen its position.

7.1.2 T-Systems Nova, Berkom

All over Europe Public Administrations are very busy in setting up projects and realising new solutions with respect to the area of e-government. T- Systems Nova is dedicated to provide a service offering portfolio, that copes with the evolution and requirements of the e-government market and enables its customers in the Public area to achieve a new level of quality, efficiency and customer friendliness. T-Systems has set up a dedicated Business Line for Public and Healthcare, which serves as a marketing and sales department of T-Systems for this specific customer segment. T-Systems Nova, on the other hand, is part of the T-Systems Service Line System Integration and thereby responsible for delivering the components, applications, services and integration accomplishment, which are required for a full customer contentment.

T-Systems Nova will therefore make use of the SmartGov project results for creating new service offerings and for enhancing its existing portfolio for the e-government market. The project results can be used to offer new customized transaction services based on modules from the SmartGov platform and the SmartGov applications. Customer specific solutions based on such standardised components can be offered . The SmartGov results will also enable new and enhanced offerings for system integration, e.g. for connecting legacy systems to e-government transaction services. Finally the different concepts developed in the project, like Process Models, Methods, Frameworks and Architectures, will be an important basis for offering consulting services to the customers from the Public Sector, either as a stand- alone offering or in conjunction with technology-related offerings.

For sales and distribution T-Systems will use a direct channel and an indirect channel. In the direct channel customers from the Public Sector are accessed from T-Systems' Service Line "Public & Healthcare" without any intermediary. This channel will be used mainly for the bigger administrations. In addition, there is the indirect channel, by which where appropriate T-Systems sells its products, services and solutions to system integrators and solution providers, that are owned by public administration, and which therefore have well established relations to some of the Public Administrations.

7.1.3 Indra Sistemas S. A.

Indra objective in exploiting the SmartGov project has a double orientation. The first one can be expressed in terms of increasing the market development in the public sector where Indra is well placed in the Spanish market. In fact the Spanish Public Administrations, both at the national and at the regional levels are good clients and they are directing their operational scope towards giving more facilities to the interaction of the citizens with the administrations, consequently developing the e-government idea.

The second orientation is geared towards increasing the know-how, expertise and technology in the area of Knowledge Management and e-government, as this expertise can be applied also in the private sectors and in the public services sectors. Indra has participated already in projects financed by the EU in this subject matter such as the Space project which allowed to develop a project for the Spanish Ministry of Public Administration called "*Ventanilla Unica*", that is the citizens have a unique window to process all their relations with the Public Administration in a given subject matter.

The *SmartGov* platform is already integrated in our Public Administrations software portfolio, Indra´s offering portfolio that embraces the company´s solutions and services for the Public Administrations. Specifically, the potential areas of application on which *SmartGov* may be suited are B2G (Business to Government) and G2C (Government to Citizen) transactional services, Integral Tax Management, Hospital Management and Front-line healthcare and the Solutions for the Social Security System. The Public Administrations sector is currently immersed in far-reaching processes of change oriented towards the improvement and effective modernisation of their structures and operating procedures, the aim being to ensure cost savings, greater efficiency and higher quality in the services rendered, all of which seek to make the member of the general public their centre and focal point. In this respect, the automation of e-form-based services by means of *SmartGov* will enrich and improve the way administrative transactional processes and services can be automated and speed.

But the market for Indra, is not limited to the Spanish Administrations (one national, 17 regional and many local ones) but also the possibilities to expand it to foreign countries through Europe and some South American Public administrations where Indra is very active, having developed, for example, with other partners the personal identification document of Argentina, are to be considered.

On the other hand *SmartGov* cannot be restricted only to the Public Sector. Telecommunication: Utilities, Trade, Industry, Finances and Insurance are potential sectors where *SmartGov* may fit very well for a wide range of services relating to e-commerce relationships, on-line transaction in banking, inter-enterprise processes, and customers and providers requests and submissions exchange.

7.1.4 Archetypon S.A.

Greece is expected to be the fastest growing economy in the European Union over the next 3 years, averaging an annual GDP growth rate of 4 %.

The Greek Government is fully committed to achieving "real convergence" which is being brought about by monetary and fiscal reforms, and by structural reforms that include deregulation and privatisation programmes. There are four good reasons for Greece to deliver a robust performance for the following years:

- Entry to Eurozone will encourage economic stability: Eurozone convergence reforms have had a significant impact on growth and economic stability. The positive factors of Greece's entry into Eurozone include a low interest rate and inflationary environment, a decline in debt burden, tax reforms, as well as structural reforms.
- Community support framework III: Greece has been allocated a stimulus package of Euro 20 billion distributed up to the year 2006. A significant proportion of this funding will be allocated to the 'INFORMATION SOCIETY' programme.
- Olympic Games in 2004: The hosting of the Olympic Games is expected to contribute between 2.3-2.6 % towards the country's GDP in that year.
- Greece is the primary gateway to the Balkan states: Greece serves as a springboard for EU's extension into central and Eastern Europe by virtue of its location and cultural understanding of the region, which is coupled with practical experience of conducting business in the region. There is an existing network of 2,500 Greek companies that have initiated direct investment programmes or marketing agreements in the regional emerging markets.

The potential for exploiting the SmartGov results in the Greek market seems very promising driven by the following factors:

- At present the e-government services provision by the Greek Public Authorities is very limited
- There will be a substantial budget allocated to Public Authorities for adopting Information Technology as part of the 3rd Communication Support Framework.
- An important percentage of Greek citizens visit governmental web sites and there is also a significant increase on filling forms and e-mail inquiries.

Archetypon intends to exploit the SmartGov project both in terms of know-how but also in order to expand its business scope. The existing liaisons with a number of public authorities will be used to directly market the SmartGov platform.

Furthermore, within the SmartGov project, Archetypon will develop knowledge management solutions, which will further enhance its existing experience in the area of knowledge management. Finally, Archetypon will use the expertise gained from its participation in the project and the liaisons that it will establish with the project's partners in order to increase its expertise in the area of providing Services to the Citizen and particularly e-government. Archetypon recognises that the area has a tremendous prospect in Greece particularly as the Greek government has allocated a large portion of the 3rd Community Support Framework OPIS (Operational Programme for the Information Society) for realising e-government. Archetypon will try to promote the SmartGov platform as a part of e-government solution that will be financed within the 3rd Community Support Framework (CSF) in Greece. This approach appears to be as the most promising due to the fact that a large amount of the CSF budget has been allocated to the Operational Programme "Information Society" (OPIS), which includes the realisation of "Electronic Government". More specifically, Action 2 "Services to the Citizen and Improvement of Quality of Life" has a budget of 879,4 MEuro and 43% of that budget has been allocated to Action Line 2.2 "Electronic Government". The CSF has duration of 7 years (2000-2006). A more elaborated investigation of the market for SmartGov platform will be presented within the Dissemination and Use Plan, as more information will be available on the budget that will be allocated for e-government services in Greece.

7.1.5 International Teledemocracy Centre, Napier University

The ITC at Napier University is committed to providing dissemination in the use of methods and tools, which improve local, national and European government work practices. In the UK the ITC is at the forefront of the "pull-through" of advanced technology based concepts to support the democratic process. Its Director was a member of a ministerial task force to develop a strategy for a digital Scotland supporting e-government services. The Centre will use its government contacts established through such work to ensure that the results of SmartGov are disseminated throughout the UK. In the last year the Centre has presented papers on e-government at the Global Cities Forum (France and the UK), the pan-Hellenic conference on Informatics and at dedicated workshops in the US and Canada. It has hosted, and will continue to host, seminars at the major national party political conferences where the results of SmartGov will be described. Wider dissemination will be through presentation of papers at international conferences and publications. Through visiting international conferences there is a guarantee that results will become public as quickly as possible. Given the increasing interest in electronic government it is to be expected that tutorials and workshops will be held in the near future. The methods and tools resulting from the SmartGov project will contribute to an increase in the take up of advanced technology in the government sector.

7.1.6 General Secretariat of Information Systems, Greek Ministry of Economy and Finance

The most promising, dynamic and modern direction in the G.S.I.S development strategy, is the creation and deployment of new Internet based Services with the aim to fully cover the citizens transactions with the Ministry. The development and deployment of online services has been rendered as a primary strategic objective of

both the M.o.E.F. and the Ministry of Public Administration. G.S.I.S. has developed the first integrated online tax and customs transactions portal, which has been fully operational since 2000. This portal is at present being used by c.a. 900,000 Greek taxpayers and corporate entities, delivering via the address www.taxisnet.gr, services and comprehensive support for V.A.T. and Income Tax transactions.
In the context of the continuous development the following services have already been launched or are due shortly:
e-income: Submission of the tax statements (∂1, ∂2, ∂3, ∂9), involving control and logic cross-checks of the statements, error corrections and editing, statement processing and printing of clearance notes, having 14,000 users during the 3-month pilot phase.
e-Code Books and Elements: Online submission of consolidated statements of customers-suppliers and statements of credit balances, with the potential to service 760,000 eligible users.
e-Large Real Estate Property Tax: Providing online assistance and documentation for the calculation of the respective Tax and the printing of the clearance note. The site has lately been enriched with tools on the Objective Calculation for Real Estate Properties.
e-Vehicles: Enables the online submission of requests for the updating of the information related to vehicle records, based on which the statements for the driving permits and the signs are sent to private vehicle owners each year.

In that perspective, the new TAXISnet - supported by the Operational Programme "Information Society", is the ambitious project that promises to meet the citizen's online tax needs. The new TAXISnet will be hosted in the portal of
www.e-oikonomia.gr and will bring to the public all currently available services along with new ones.
The aim is to support the totality of the common day-to-day transactions of the taxpayers and the corporate entities, which are now being performed requiring physical presence at the local tax offices.
The project has been budgeted at 6 million Euros, has been integrated in the Operational Programme and is in bidding process.
Among the services planed to be offered thru the new TAXISnet there are a lot of services consisting of submission of miscellaneous e-forms (declarations). These can be easily implemented using the SmartGov platform which is already operational and since these services have many common parts the SmartGov platform is expected reduce development costs significantly.

7.1.7 City of Edinburgh Council

The City of Edinburgh Council agreed its 21st Century Government Plan in June 2001 in line with the Scottish Executive Framework for 21st Century Government which comprises the following key themes: openness, accountability, inclusiveness, working in partnership and delivering services people want. A number of social, economic and geographical factors have influenced the way Edinburgh's vision for 21st Century Government is shaped for the city. Edinburgh has the fastest growing

economy in the UK with a forecast that by 2016 23,000 jobs will be created in the city with the number of households potentially increasing by over 35,000. Edinburgh's E-Government strategy is known as the Smart City Vision. The Smart City Vision is about customer focused public services and the relationship between citizens and the authority. It is about changing the way the Council organises and delivers its services to be efficient, effective and customer focused. It includes using information society technology (ICT) to deliver these services to citizens, business and organisations. The Council's partnership with British Telecom provides Edinburgh with a solid base for developing Edinburgh as a Smart City.

E-form implementation has been an integral part of UK government strategy since 1998 when targets were introduced by the e-Envoy as part of its UK online initiative. There is a government target to have 100% of services online by 2005 and this is shaping opportunities for the use of e-forms, particularly in the public sector. Within central government departments and local authorities senior officials have now been given responsibility for co-ordinating 'e-business plans', setting out their approach to meeting the target by 2005. In Scotland there are 32 local authorities and in England and Wales there are 410. There are therefore a total of 442 local authorities in the UK with a target to provide 100% of services online by 2005. It is not only the public sector that is interested in this area. The private sector has a strong interest in the development of better, more efficient electronic solutions to standard processes and customer interface. This all means that a potentially large and interested market for new e-government solutions exists.

Edinburgh initially applied the SmartGov platform within the Social Work Department where a number of key processes involve the use of forms. This pilot application allows the Council to gain valuable knowledge and also to develop a test bed for the launch of the idea into other areas of the Council and elsewhere in the UK. From this vantage point the City of Edinburgh Council will be able to demonstrate and promote the solution to other Local Authorities and interested organisations in Scotland and the UK.

8 Conclusions

Electronic Government is high on the agenda of every European country. The SmartGov project aims at introducing a new way of developing, deploying and maintaining e-services with the provision of a development environment specifically designed to meet the needs of public servants. To this end it introduces several knowledge management aspects in the services for assisting both public servants at developing a new service but also citizens using them.

The SmartGov project addressed the need for a user-friendly environment for the development of electronic services following a holistic approach. The consortium very soon realised the complexity of the realisation of this concept both at the technical and also at the organisational level. At the technical level this realisation implies the use of new, state-of-the-art concepts and technologies. At the organisation level it requires the adoption of a new model for developing e-services.

The SmartGov within its two years duration managed to achieve its initial objectives. The main results are: The e-services development platform, the Knowledge management repository, the SmartGov agent technology, and the eGovernment Services Ontology and SmartGov Framework for e-government services. At the scientific level the consortium achieved a notable record of 9 peer-reviewed publications so far, while a few more are currently under review or under preparation.

The platform that has been developed offers public servants a multilingual, friendly, easy to use, personalised environment for the development and deployment of electronic services. As it was shown during the evaluation this environment covers all main requirements for the creation of transactional e-services. The platform encompasses all the necessary functionality and the users' response during the trials was more than positive.

The consortium believes that this platform is very close to becoming a commercial product. As indicated by the market analyses there is currently a strong need in governmental agencies for the development of new e-services. The SmartGov platform can meet this need and equip the public servants with a tool that will allow them to easily create, deploy and deliver e-services.

In summary, the SmartGov platform improves the working environment for public authorities employees and enhances the efficiency and effectiveness of electronic government service delivery. Moreover, it offers a framework for the development of e-government services that can be that is intended to benefit any public authority that is planning or already delivering electronic transaction services.

