Collaborative Work in eGov Administration

MUAZ CISSE

Project in E-Government

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Table of contents

1 Introduction ......................................................................................................................... 1
2 Forms of Collaborative Arrangements ............................................................................. 2
  2.1 Organizational or administrative collaboration ............................................................ 4
  2.2 Technical collaboration ................................................................................................. 5
  2.3 Semantic collaboration ................................................................................................. 7
3 Use case ............................................................................................................................... 9
  3.1 Organizational or administrative collaboration ............................................................ 9
  3.2 Technical collaboration ................................................................................................. 13
4 Conclusion .......................................................................................................................... 16
A Bibliography ....................................................................................................................... 17
Electronic Government (eGovernment) seeks to use the opportunities provided by networked computer technologies to deliver government services. Information technology has not significantly changed the process of public sector management, just its implementation. The current approach is to use web and Internet based technologies which act as an intermediary platform for the delivery of these services.

A government is comprised of several departments which are responsible for rendering different services. Organizational or administrative tasks are diverse and each department adopts a platform that is better oriented to deliver its services. In most cases, these platforms are developed locally and thus lack an overall framework for including platforms from other departments. This often leads to inconsistency or incoherence, redundancy, lack of coordination and difficulties in terms of collaborations. In addition, the systems developed by these departments are often incompatible with other systems.

The purpose of this seminar is to provide an overview of collaborative efforts adopted by certain governments, conditions of success, the challenges they encountered in their implementation and the positive impacts of these collaborations. It will address questions such as: why is there such a need for common office document standards and a collaboration framework? It also proposes useful process and tools that can help put in place a collaborative structure.

Chapter two introduces and discusses the different forms of collaborative arrangements and their e-government areas of application. Chapter three discuss partnerships with the private sector in e-government with a focus on:

- The challenges countries face in setting up and implementing them as well as solutions which have been identified to overcome them;
- The lessons learned and good practices emerging from concrete cases of implementation in selected countries.

Chapter four looks at approaches and models of collaboration among government organizations and the role of e-government coordinators in promoting collaborative arrangements on e-government.
Collaboration is technologically defined as “the ability of two or more systems or components to exchange information and to use the information that has been exchanged” (IEEE, 1990). We also define collaboration within e-government, as it is an important issue to determine how technical systems, people and organizations can work together, both within and across country boundaries. The definition of collaboration is modified slightly for the eGovernment context. eGovernment is defined as: “the use of ICT in public administrations combined with organizational change and new skills in order to improve public services and democratic processes, and strengthen support to public” (European Commission, 2008).

Figure 1 shows an online citizen electronically accessing information provided by a government’s agency A. The information is stored in a database by the agency and the citizen accesses the information through the agency’s web interface.

As mentioned above, a government is comprised of many different departments (agencies) and each will provide its services to the citizen in a similar way. Taking into consideration the fact that all of these entities are part of a single global body, the non-synchronized information they provide to the online citizen may be redundant or at times conflicting. In order to solve this problem, collaboration is needed among the various agencies in which data is collected in a centralized way.

Collaboration in eGovernment is complex and can draw different levels of government together. For example, Switzerland has three political layers of government: federal
government, cantonal (state) government and municipal or communal government. Given this complex, multilayered and multilingual, situation, the collaboration model has to provide a framework that addresses the need to have all layers of government collaborate with each other, and with the citizen.

For eGovernment, the concept of collaboration goes beyond the notion of just technical standards for data exchange, and includes issues such as legal constraints, organizational workflows amongst disparate organizations, and an understanding of the data ontology. Therefore, collaboration in the context of eGovernment can be defined as: “the ability of information and communication technology (ICT) systems and of the business processes they support to exchange data and to enable sharing of information and knowledge.” [IDABC, 2008]. By collaborating, governments would be able to make better decisions, offer better public services and provide better governance.

Figure 2: Collaboration in E-Government

Figure 2 shows a simple eGovernment collaboration model. The data is stored in a centralized database or data warehouse and the various departments can access the data by passing through the filtering tool. The filtering tool manages information access and security. The online user uses a centralized government web portal to receive or send information.
In accordance with this definition, it is obvious that eGovernment collaboration has to be done on several levels: organizational, technical and semantic (European Commission, 2008).

### 2.1 Organizational or administrative collaboration

Organizational collaboration “is concerned with defining business goals, modeling business processes and bringing about the collaboration of administrations that wish to exchange information and may have different internal structures and processes.

Government agencies and departments frequently develop information, strategies and other activities for their daily activities. These activities are in most cases similar to those developed by other departments. The advantage of collaborate by the various departments in this case will be to effectively reduce social, economic, and environmental costs. It will also allow them to provide coherent and consistent information to the citizens.

Collaboration in this context can be done through networking, cooperation, coordination, or coalitions.
Forms of Collaborative Arrangements

Networking in this context will involve dialoguing to find a common understanding. Cooperation will involve matching the needs of the various departments and providing coordination to provide effective solution to these needs. It will also enable minimize the duplication of services. Coordination involves sharing resources to address common issues. New resources can also be created if needed. Coalition involves sharing ideas and pulling resources from existing systems instead of creating new ones.

2.2 Technical collaboration

Technical Collaboration “covers the technical issues of linking computer systems and services. It includes key aspects such as open interfaces, interconnection services, data integration and middleware, data presentation and exchange, accessibility and security services”. When applied to computer-based information systems, technical collaboration leads to the concept of open system, in which the heterogeneity of components is no longer an obstacle to seamless data exchange.

This form of collaboration can be done through web services, common libraries, and common business process definition.
An IT infrastructure built around interoperable technologies and Web services facilitates the establishment of an agile IT infrastructure. As a result, businesses can focus on clearly defining business drivers and developing incremental solutions that meet such needs.

A SOA is a way to define and provide an IT infrastructure to allow different applications to exchange data and participate in business processes, regardless of the operating systems or programming languages underlying those applications [Idea Group Inc. 2001].

![Diagram of IT infrastructure components](image)

**Figure 5**: Collaboration in E-Government [Idea Group Inc. 2001]

A service orientation defines the needs and outcomes of eGovernment in terms of services, independent from the technology (the hardware platform, operating system, and programming language) that implements them. What distinguishes SOA is its implementation of “a service platform consisting of many services that signify elements of business processes that can be combined and recombined into different solutions and scenarios, as determined by the business needs.”

Service-oriented architecture, by the means of Web services, can provide a standard and efficient communication means among different governmental agencies involved in providing integrated services as well as dynamic context-driven information to the citizen (i.e., services personalized according to the user, for instance, customers or employees, the device, laptops, PDAs, or smart phones, and different situations, for instance home, hotel, or office) (Sharma and Gupta, 2004).

A service-oriented development has the following advantages [Newcomer & Lomow, 2004]:

- **Reuse**: The ability to create services that are reusable in multiple applications.
• **Efficiency**: The ability to quickly and easily create new services and new applications using a combination of new and old services, along with the ability to focus on the data to be shared rather than the implementation underneath.

• **Loose technology coupling**: The ability to model services independently of their execution environment and create messages that can be sent to any service.

• **Division of responsibility**: The ability to more easily allow business people to concentrate on business issues, technical people to concentrate on technology issues, and for both groups to collaborate using the service contract.

2.3 **Semantic collaboration**

“The Semantic Web is an extension of the current web in which information is given well-defined meaning, better enabling computers and people to work in cooperation.” [T. Berners-Lee et al. 2001]

Semantic Collaboration “is concerned with ensuring that the precise meaning of exchanged information is understandable by any other application that was not initially developed for this purpose. Semantic collaboration enables systems to combine received information with other information resources and to process it in a meaningful manner.” Semantic collaboration is therefore a prerequisite for some front-end delivery of services to the user, such as multilingual services, for example.

Semantic interoperability is tackled using knowledge repositories and semantic tools. The former consist of business services catalogue, directories of services and service providers, laws and regulations, ontologies and semantic indices. The latter consist of an ontology management system, a semantic annotation tool and a semantic engine. Four phases unfold in order to exploit the semantic solutions.

One common tool that can be used initiate this form of collaboration is WSDL. The Web Services Description Language (WSDL) is a formal language specification for providing formal service description that provides information about service locations and service interfaces.
**Forms of Collaborative Arrangements**

**Figure 6**: WDSL as a description language in Web Services [Abo Khaled, 2008]
3

Use case

3.1 Organizational or administrative collaboration

EDEC

The Swiss Customs clearance of goods, so-called cargo processing, is one of the core responsibilities of the Swiss Federal Customs Administration. Because of the political, legal, technological, and economic developments of the past few years, the Federal Customs Administration now has a very broad palette of products at its disposal, all of which have the same objective: the customs clearance of goods. These products include diverse form-based and IT-based solutions for the import, transit, and export of goods.

This multiplicity of cargo processing products increasingly results in service offerings that are perceived both by clients and within the Federal Administration as too broad and unclear. Moreover, the cargo processing products offered are often isolated solutions that are not sufficiently harmonized. This leads to efficiency deficits and higher costs for all parties involved. [EDEC, 2008]

To remedy these problems, the Federal Customs Administration developed a software program called e-dec. With e-dec, the Federal Customs Administration is developing a central cargo processing product that will gradually replace existing products, such as the electronic customs clearance system M90 and the form-based transit procedure.

E-dec is the outcome of two projects carried out by the Federal Customs Administration. These projects are named IgVV (Computer-Aided Common/Community Transit Procedure) and RM90. The e-dec Import Module is being developed within the RM90 project. The IgVV project covers the Transit and Export Modules. Depending on the subject matter, upstream and downstream processes are developed by RM90 or IgVV staff members or jointly. [EDEC, 2008]

The Business model of E-dec consists of the following categories:

- Declaration
- Checkup
- Release
- Back office
- Contingents
Each of these categories is composed of elements called "use cases". Each use case represents a specific functionality that the application has to offer. A use case typically contains a specific function to consider separately, to be implemented under certain conditions, by a person or a technical system under the clearance of goods for import (for example, by submitting the import declaration to the test of plausibility).

E-dec has a modular structure. In this way, the Federal Customs Administration aims to offer clients the possibility of performing electronic clearance of import, transit, and export goods using largely uniform guidelines. In this way, more uniform and streamlined processes are created for both sides, resulting in lower costs.

Figure 7: E-dec architecture [SISA, 2008]

Figure 7 shows the architecture of the E-dec Application. Third-party systems, such as applications developed by different companies, can connect to E-dec standard interfaces and transmit information electronically to the Swiss Customs Administration.

A EDI / XML converter developed by ASIS can convert the data extremely efficient. The ICC module provides Internet communication system with the AFD.

The Swiss “Announcement of Moving” service

Every year 15% of the registered citizens in Switzerland change their address [CH.CH, 2008]. They are moving within the same town or the same Canton or to another Canton. Of course, it is also possible for a citizen to leave Switzerland or come to Switzerland from another country. The citizen has to announce the change of their address personally to the municipality and also to other public bodies. It is also necessary for the citizen to announce this change to private firms such as Telecom providers, electricity providers, Post services, etc.
The aim of the pilot was to facilitate the announcement of moving by offering an online interface that will enable the citizen to provide only once the needed information and the system will propagate this information to all concerned actors.

The pilot was built on a totally new and standalone infrastructure and interacted with different web services to complete the service in cooperation with different (simulated) municipalities.

The idea was to present a system able to provide a one-stop service to the citizen while performing complex actions with different legacy systems. The Swiss pilot provides a good example of a running a one-stop service that involves different Municipalities and is offered by a “broker” (BK).

The user must give information about his personal details (name, address, etc…), the municipality he is currently living in and the municipality he is moving to. Then the system checks the eligibility of the data, and if they are valid, it invokes the “deregistration” Web Service of the “old” municipality. Then, if the deregistration is successful, it invokes the “registration” Web Service of the “new” municipality. The running example could be extended to inform some external partners (public or private) at the end of the process. Due to time restrictions, this has not yet been realized. The audit and tracking component is used by the domain expert to monitor the process and to request the status of the execution.

**Figure 8: Address distribution model**
Figure 9: The Swiss “Announcement of Moving” service

The evaluation for the Swiss pilot was performed by Mrs Hanna Muralt, BK, Swiss OECD representative for e-government and Mr Urs Fässler, consultant, member of the board of the Swiss Federal E-Government portal, www.ch.ch. The project was described as very interesting and useful for the strategic development of e-government. It provides a new way
of thinking the processes used by eGovernment activities and a useful tool for a strategic analysis of any foreseen modification of the law. It is pointed out that, in Switzerland, any new law or modification of a law must describe its consequences on the environment, its compatibility with the EU regulation and also its financial consequences. Pretty soon, there will also be a need to describe the influence on the actual eGovernment applications and the cost for their adaptations. With this new need, the ONTOGOV solution can be useful for analysing the consequences of a change in the law.

3.2 Technical collaboration

E-GovSM (e-government Service Marketplace)

The E-Government Service Marketplace (E-GovSM) is based on a service oriented architecture, which aims at exploiting benefits of this new paradigm in order to allow cooperation and integration among application of different agencies.

The E-Government Service Marketplace facilitates the interaction between citizens and public administration by providing seamless services to citizens at transaction level (i.e., allowing the complete online handling of the service delivery process).

The E-GovSM’s main purpose is to provide quality citizen-oriented services facilitating citizen to public administration interaction. As it happens, in a traditional marketplace where a citizen can buy the products he or she needs without caring about production and delivery process, the e-government marketplace aims at providing e-government services to citizens without requiring the citizen to be aware of administrative process complexity.

For instance, for the delivery of a document, citizens will not be concerned with administration responsibility or geographical location of information. The E-GovSM purpose is not only to use technologies to increase the efficiency of administrative process. It also aims to make it easier for citizens to interact with public administrations rebalancing relations between citizens and administrations, and presenting e-government services according to citizen needs. For this reason the e-government Service Marketplace aggregates services according to “life event metaphor” (Dipartimento per l’Innovazione e le Tecnologie, 2002; Life Event Portal), for example, services are organized around events that make sense for the citizen and the citizen doesn’t need to be aware of various public administrations involved in the delivery of such services. The life of citizens is described by providing a list of events that when occurring in citizen life; result in a series of transactions between a citizen and different public sector organizations. Examples of life events are “looking for a job,” “moving home,” “learning to drive,” “pensions and retirement,” “having a baby,” and so on.

The main design requirements upon which the E-GovSM architecture is based are the following [Idea Group Inc. 2001]:

- **Provide citizen-oriented services**: Provide services to citizens every time they need them, wherever they are, and in a personalized way

- **Ease public administration interoperability**: Allow integration of legacy systems and use a loosely coupled interaction among agencies by assembling on-demand Web services to automate e-government seamless service delivery
• **Respect the autonomy of the single administration:** For Example, it doesn’t oblige each single administration to deploy an instance of the proposed architecture by proposing an incremental integration approach.

• Provide a single access point to government services via the Web, built around the citizens life events metaphor (Dipartimento per l’Innovazione e le Tecnologie, 2002) to hide the complexity of administrative process.

• Perform the necessary operations for collecting the information to deliver government services instead of the citizen.

Figures 2 shows the entities involved in the marketplace and possible interactions between them. From the one hand, citizens access the marketplace via a portal, from the other hand, public administrations subscribe to the marketplace in order to share data and provide services. The figure highlights three different types of public administrations (PAs). PAs of “type A” represent administrations subscribed to the E-GovSM that automatically provide data to the marketplace without requiring the citizen to interact with them. PAs of “type B” represent administrations subscribed to the E-GovSM that, even if can automatically provide data to the marketplace, require a direct interaction with citizens (for example a hospital in case of a medical examination). Finally, PAs of “type C” represent administrations that are not subscribed to the E-GovSM and hence require a direct interaction with citizens to provide data.

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**Figure 10:** eGovernment service marketplace-involved entities and interactions among them
Figure 11: Provisional Driving License delivery: Sequence diagram
The Internet and related electronic information and communication technologies (ICTs) are being used increasingly to enhance the delivery of public services and citizens’ democratic engagements with government.

This seminar tries to explain the concept of collaborative work in an eGovernment framework. It details the three levels of collaboration and suggests ways of achieving a breakthrough in each level.

Integration and collaborations lie at the heart of any eGovernment project. This potentially reduces platform complexity, since application complexity is divided more or less equally between the service providers (including attached legacy systems via XML-interfaces) and the platform, which need only undertake service registration, discovery and delegation of service requests.

What appears mandatory in this context however, is to define declaratively and unambiguously the meaning (semantics) of all operations offered by web services: no dynamic query can succeed under ambiguities in such semantic descriptions.

To this end, two general types of approach are used [European Commision, 2008]:

- Process-oriented, based on workflows for process modelling accompanied by "light weight" semantic descriptions of services (implemented using enriched BPEL and WSDL), or more commonly:
- Service-oriented, based on a single semantically-rich conceptual model covering all aspects of semantic web services including formalism for process modeling (implemented using OWL-S, WSMO and WSMX).

Semantics does not solve the collaboration issue per se, but enables intelligent solutions to deal with the problem in a more dynamic, automatic and flexible way. Solutions developed in this way make use of the semantic descriptions of the domain, resources or data to achieve semantic collaboration via service mediation.

Collaboration at the technical level is essentially assured via web-services. Difficulties are encountered when other services or legacy systems are involved and these are generally tackled via wrapper web services and XML interfaces.

Finally, some use cases which helped concretize the points discussed were presented. One of them, the E-GovSM provides quality citizen-oriented services (i.e., providing services according to citizen needs) by using Web Services oriented approach.
Bibliography

[IDABC, 2008]

[T. Berners-Lee et al. 2001]

[Idea Group Inc. 2001]
Elena Mugellini, Omar Abo Khaled, Maria Chiara Pettenati, Service Oriented Architectre for Seamless in Interoperable Service Delivery, Scientific American, May 2003, page 295.

[Abo Khaled, 2008]

[Sharma and Gupta, 2004]


[EDEC, 2008]

[SISA, 2008]

[European Commission, 2008]
visit: October 11, 2008.

[CH.CH, 2008]