

# Interoperability Integrating E-Government Portals

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## INTRODUCTION

In recent years, we have witnessed the rapid evolution of the World Wide Web. This development allowed millions of people all over the world to access, share, interchange, and publish information. In this context, many governments have realized that their information resources are not only of value in themselves. They are valuable economic assets—the fuel of the knowledge economy. By making sure the information they hold can be readily located and passed between the public and private sectors, taking account of privacy and security obligations, it will help to make the most of this asset, thereby driving and stimulating national and international economy. The governments take advantage of information and communication technologies (ICTs) and the continuing expansion of the Web and started e-government strategies to renew the public sector and eliminate existing bureaucracy and therefore reduce costs (Riedl, 2003; Tambouris, Gorilas, & Boukis, 2001).

There is a growing awareness that the interoperability of national public ICT infrastructures is a precondition for a more service-oriented and competitive public sector. Ever since the adoption of the Interoperability Decision (1720/1999/EC) of the European Parliament and of Council in July 1999, the European Commission has focused on the pan-European dimension of e-government and on the interoperability requirements for its implementation.

This article highlights the critical issue of interoperability and investigates the way it can be incorporated into e-government domain in order to provide integrated, efficient, and effective e-services. It also describes the issues, tasks, and steps that are connected with interoperability, depicts the technical dimensions that arise, proposes solutions when possible, and discusses its effectiveness. Moreover it investigates the methodology to develop a generic, standardized,

interoperable platform able to model and manage administrative business-related processes and content and follow a one-stop approach where certain governmental organizations, through their portal, act as liaisons (intermediaries) between the Government, and clients and businesses, introducing a new Government level. Hereafter, the term *clients* is used for both citizens and businesses, as they are clients of e-government portals. Finally, it illustrates the future trends in the field and, thus, suggests directions that may produce new scientific results.

## BACKGROUND

Although countries worldwide are different culturally, politically, and in population and education, they all have one thing in common—they all realize that their national investment in information technology (IT) provides enormous opportunities for making the transformation of their government into a citizen-centered e-government. It is obvious that governmental institutions and agencies are the most complicated organizations in the society providing the legal, political, and economic infrastructure to support the daily needs of clients (Bouguettaya, Rezugui, Medjahed, & Ouzzani, 2004). In their transition from the traditional operation and interoperation to the electronic one, the Web can be considered the key vehicle for the implementation and achievement of this scope. In this framework, governments across the world are grappling today with how to use electronic technologies to improve services to citizens, increase efficiency (including reducing inefficiencies due to redundant and overlapping government agency activities, investments, duplicative reporting requirements, among others), and streamline traditional paper processes.

Under this scope, governments worldwide have launched several portals in order to provide digital information to clients and ease their electronic transaction with government. E-government portals cover several multidimensional scopes of daily life; they contain information on laws, announcements, governmental authorities' profiles, and provide electronic transactions to clients such as e-finance, e-procurement, e-learning, etc. The pioneer e-governmental portals are the ones of Canada (<http://www.canada.gc.ca>), USA (<http://www.firstgov.gov>), UK (<http://www.ukonline.co.uk>), and Singapore (<http://www.gov.sg>). According to a survey research recently conducted in the USA, the majority of the Internet users in each country thought that their government is doing a good or excellent job developing online resources that allow them access to information and conduct online transactions with the government (Bose, 2004).

During this decade, many researchers study different aspects of how e-government may eliminate bureaucracy (Pavlichev & Garson, 2004). The researchers deal with interesting, however, difficult scheme to conclude to policies, able to be applied worldwide as standards. Many outcomes of how e-government may facilitate clients' transactions with public sector conclude that an interoperability framework must be defined. According to EC-DG ISM (2006), the lack of interoperability (62%) is considered as the most important barrier in achieving the objectives for more efficient and effective e-government. Interoperability means the ability of ICT systems and their supported business processes to exchange data and enable information and knowledge sharing.

An interoperability framework can be defined as a set of standards and guidelines that describes the way in which organizations have agreed, or should agree, to interact with each other. An interoperability framework is, therefore, not a static document and may have to be adapted over time as technologies, standards and administrative requirements change (IDABC, 2004).

By joining up administrative processes, everyone, whether in the public or business sectors, could achieve a significant increase in efficiency and lower the cost of operations. Interoperability is essential for this *joining up* of public administration, to share and re-use administrative information, and to provide services and information over multiple channels. In essence, interoperability is a fundamental requirement from both economic and technical perspectives for the development of efficient and effective e-government services at both the national and international levels, including the regional and local ones. According to IDABC (2004), three aspects of interoperability need to be considered: organizational, semantic, and technical interoperability.

In multicultural environments like in the European Union, public administration is a complex network of organizations, people, languages, information systems, information structures, rules, processes, and practices. Effective uti-

lization of ICT requires explicit rules for communication and means for the integration of heterogeneous systems and information resources. XML is a tool for the purpose (Salminen, 2005).

A Web service is a software system identified by a uniform resource locator (URL), whose public interfaces and bindings are defined and described using XML. Its definition can be discovered by other software systems. These systems may then interact with the Web service in a manner prescribed by its definition, using XML-based messages conveyed by Internet protocols (Booth et al., 2004). The Web service model consists of three entities, the service provider, the service registry, and the service consumer.

## METHODOLOGY TO INTEROPERABLE MODEL

The scope of the approach presented in this section is to introduce a generic model, capable to manage administrative clients-related processes and content using a Web service-oriented architecture (SOA) and a Web service orchestration structure. The approach follows a one-stop approach where a governmental authority acts as a trans-government liaison (intermediary) between the government and clients. The e-government interoperability model could be used by governmental organizations (GOs), including other collaboration authorities in order to create and develop common, multilingual, multi-platform, trans-governmental (even trans-European) e-services in a uniform and standardized way, thus enabling process transparency and facilitating mobility of services.

At present, common practices and legislation in force requires clients to carry out a number of bureaucratic procedures. The common denominator for most of those procedures is the fact that the interested persons or businesses act as information mediators. That means that they have to submit to GOs various documents issued by other governmental authorities, or they have to submit copies of the same documents to more than one.

The emerging problems are many. The existing bureaucracy indirectly embarrasses citizens, businesses, and public sectors to function and complete their daily tasks, especially when dealing with public services. The current functionality model of public sector inserts many difficulties in the operation of businesses. The main problems that are often compounded are:

- Failures in communication.
- Need for shared data and information.
- Difficulty in access the right information.
- Collection of large amounts of data over time.
- Incompatible data formats.

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