Chapter 42
National Interoperability Frameworks:
The Way Forward

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ABSTRACT

National Interoperability Frameworks (NIFs) have been established during the last years as the governmental policy cornerstones for deploying joined-up information systems and providing one-stop services to citizens and businesses all over the world. In order to meet the rising expectations of their stakeholders, to cope with technological evolutions in the future internet era, and to achieve efficient resolution of the evolving interoperability problems, NIF's developers face new challenges: The scope of the frameworks needs to be extended, including service composition and discovery, development and management of semantic elements, certification mechanisms and authentication standards. Moreover, a shift from a paper-based specification towards a repository of services, data schemas, process models and standards is needed, in order to serve the ever-changing requirements of governments under transformation. Going beyond an analysis of relevant frameworks at an international level, this chapter illustrates the best practices and the future directions for NIF's, proposing an infrastructure that can meet the demands for modelling, storing, managing and transforming vast numbers of service descriptions, XML hierarchies, as well as specific technical, semantic, organisational and legal interoperability standards.

INTRODUCTION

During the last decade, the World Wide Web has gone through an evolutionary path of advancements from monolithic, hyper-text applications to the Semantic Web, Web 2.0 and the emerging

Internet of Services and Internet of Things. Following a similar trend, electronic government although virtually unknown a decade ago as a term, as an identified activity, and as a topic for research (Heeks & Bailura, 2006), is explicitly seen as what "would have seemed a utopian dream just a decade ago" (Garson, 2004). Lack of interoperability appears, in this context, as the

most long lasting and challenging problem for enterprises and governmental organisations which has emerged from proprietary development or extensions of information systems, unavailability or oversupply of standards, and heterogeneous hardware and software platforms (The Yankee Group Report, 2003).

In the e-Government domain, i2010, the strategic action plan of the European Commission (CEC, 2006a), presents interoperability as a prerequisite for "devices and platforms that 'talk to one another' and services that are portable from platform to platform" and identifies it as one of the main building blocks for the single European information space of eServices (SEIS) (CEC, 2006b). In fact, the achievement of pan-European, cross-border interoperability is a key element and prerequisite of all the EU's ambitious e-Government initiatives, such as the European Interoperability Framework (IDABC, 2008), the Services Directive (2006/123/EC) (European Commission, 2007) and the Public Sector Information Directive (2003/98/EC). The importance of interoperability at a pan-European context is also depicted in the Competitiveness and Innovation Programme (CIP) by the large scale pilot projects that are funded, aiming at deploying interoperability infrastructures at pan-European level for e-Procurement (PEPPOL – Pan-European Public Procurement Online), for e-IDs (STORK – Secure Identity Across Borders Linked) and the Services Directive (SPOCS - Simple Procedures Online for Cross-border Services). In this direction, an article around interoperability published in Financial Times recognizes that successful interoperability dramatically cuts the costs, risks and complexities of hooking up and represents a challenge to competition policies in Europe and America (Schratz, 2009), while Gartner (2009) characterizes monolithic, centralized architectures that focus only within the enterprise, and not on business partners and customers, as worthless. Since successful organisations of the future will be characterized by their ability to collaborate, their ability to adapt, and their ability to interoperate

(Charalabidis et al., 2008b), the most valuable characteristic of an organisation is its ability to adapt to the dynamic environment in which it operates (Lindsay et al., 2003).

Through the years, interoperability has obtained a broad, all-inclusive scope of a repetitive, well organised, and automated at ICT level feature of organisations, as indicated in the definition of the EIF Draft Version 2.0 (IDABC, 2008): "Interoperability is the ability of disparate and diverse organisations to interact towards mutually beneficial and agreed common goals, involving the sharing of information and knowledge between the organisations via the business processes they support, by means of the exchange of data between their respective information and communication technology (ICT) systems". Interoperability cannot be resolved at once and requires targeted, co-ordinated efforts at various distinct levels as proposed by (IDABC, 2004 & 2008; Gottschalk, 2008; Scholl & Klischewski, 2007; MODINIS, 2007; Ziemann et al., 2008). In alignment with the European Interoperability Framework (draft EIF 2.0), interoperability in e-Government spans over five levels:

- **Political Context:** since cooperating partners need to have compatible visions and focus on the same things. Moreover constant commitment to solve any problem that may arise to the other levels is also a prerequisite.
- **Legal Interoperability:** including the analysis and synchronization of the legislation that regulates the operation of two or more organisations wishing to cooperate for the delivery of interconnected services and exchange data. It also aims at ensuring that electronic data has appropriate legal weight in all collaborating organisations.
- **Organisational Interoperability:** where the goals, the procedures and the involved entities are identified in order to ensure that two or more organisations agree on

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