Interoperability in Digital Public Services and Administration: Bridging E-Government and E-Business

Yannis Charalabidis
University of the Aegean, Greece

IGI-Global book
ISBN: 978-1-61520-887-6

Detailed Table of Contents

Foreword : The Policy View
Gérald Santucci, European Commission

Foreword: The Industry View
Wilfried Grommen, Microsoft Corporation

Foreword : The Research View
Hans J. Scholl, University of Washington

Preface: Interoperability – The Great Enabler
Yannis Charalabidis, University of the Aegean, Greece

Section 1: Interoperability Guidelines, Frameworks and Standards

Chapter 1
National Interoperability Frameworks: The Way Forward
Fenareti Lampathaki, National Technology University of Athens, Greece
Christos Tsiakaliaris, Planet SA, Greece
Antonis Stassis, Ministry of Interior, Greece
Yannis Charalabidis, National Technical University of Athens, Greece

This chapter, coming from the team that drove the creation of the new Greek National Interoperability Framework (NIF), dives into the attributes, characteristics and content a NIF must have. Stassis, managing the Ministry team, Charalabidis, managing the delivery team, Tsiakaliaris and Lampathaki holding key positions in the collaborative development of systems and standards, provide an insight on the challenges that governments face during NIF development. Going further than describing the case, they also perform a worldwide analysis and propose how interoperability can be achieved in the years to come, through infrastructure development, semantics, organisational guidelines, public sector involvement and citizen participation.

Chapter 2
Setting the Dutch E-Government Interoperability Agenda: A Public-Private Partnership
Rex Arendsen , Ministry of Finance, The Netherlands
Sander Zwienink , Ministry of Interior and Kingdom Relations, The Netherlands
Paul Oude Luttighuis, Novay, The Netherlands

Like national governments across the world, Dutch government pursues an active policy towards, both with businesses and citizens, as well as across government bodies. Arendsen, Zwienink and Oude Luttighuis provide a

case study on how Dutch government has approached e-government interoperability, including issues of policy setting, governance, standardization, and openness. Starting from a short historical overview, recent developments are described, such as the new action plan "Netherlands in Open Connection" and the establishment of Dutch government Standardization Board and Forum. Finally, an interoperability agenda is presented, with four items of first priority: open standards, interoperability governance, service concepts, and semantic interoperability.

Chapter 3
The Challenges of Implementing e-Government Interoperability in Thailand: Case of Official Electronic Correspondence Letters Exchange across Government Departments
Apitep Saekow, Thammasat University, Thailand
Choompol Boonmee, Thammasat University, Thailand

Saekow and Boonmee present their experiences during the development of the Thailand electronic government interoperability framework (TH e-GIF), diving into one of the first projects concerning the implementation of the semantic interoperability infrastructures for exchanging official electronic letters across 29 government agencies using 15 heterogeneous software systems developed by different vendors. They describe the process of data harmonization, modeling and standardizations using a number of UN/CEFACT and XML specifications and standards. Finally, risks and key success factors for the electronic interoperability development in Thailand are presented.

Chapter 4
eGovernment interoperability framework in Lithuania: preconditions and challenges
Rimantas Gatautis, Kaunas University of Technology, Lithuania
Elena Vitkauskaite, Kaunas University of Technology, Lithuania
Genadijus Kulvietis, Vilnus Gediminas Technical University, Lithuania
Demetrios Sarantis, National Technology University of Athens, Greece

This chapter presents the adventure of a new, small in population European Union member state that tries to incorporate interoperability standardisation for the first time. Gatautis, Vitkauskaite, Kulvietis, Gediminas and Sarantis are describing the activities performed in this country, that had the privilege to study at least four existing standardizations, by arriving in the "interoperability club" after many others. An excellent chapter for developing countries, that want to avoid mistakes and wrong decisions during the early stages of the process, also one of the first demonstrations of international collaboration – in this case between Lithuania and Greece.

Chapter 5
Finding and Sharing e-Government Resources – Challenges and Approaches
Karl Wessbrandt, Chairman, Wessbrandt Management AB, Sweden & CEN/ISSS eGov-Share Workshop

Wessbrandt, the Chairman of one of the most important CEN/ISSS workshops on semantic interoperability, presents an introduction to reasons for collaboration and reuse of e-Government resources and a summary of the results so far of some European e-government initiatives. He analyses eGov –Share workshop results, together with some more projects within the European Commission´s IDABC program. This chapter coming from an e-Government practitioner´s viewpoint and experience, also identifies shortcomings and weak points and gives recommendations of future activities in the field.

Chapter 6
Interoperability Requirements, Recommendations and Standards in E-Participation
Sabrina Scherer, University of Koblenz-Landau, Germany
Naoum Liotas, University of Macedonia, Greece
Maria A. Wimmer, University of Koblenz-Landau, Germany
Efthimios Tambouris, University of Macedonia, Greece
Konstantinos Tarabanis, University of Macedonia, Greece

This collective chapter is attempting a first capturing of the interoperability needs in the electronic participation field – a rapidly evolving area for digital public services. Scherer, Liotas, Wimmer, Tambouris and Tarabanis try to

frame the problem by studying the interoperability requirements of e-participation tools, relating to the European Interoperability Framework (EIF) and finally deriving a set of interoperability recommendations that organisations have to look upon, when developing and deploying e-Participation systems and services.

Section 2: Interoperability Infrastructures & Services

Chapter 7
Model-driven Development of Interoperable, Inter-organisational Business Processes
Harald Kühn, BOC Information Systems GmbH, Austria
Marion Murzek, BOC Information Systems GmbH, Austria
Gerhard Specht, BOC Information Systems GmbH, Austria
Srdjan Zivkovic, BOC Information Systems GmbH, Austria

Kühn, Murzek, Specht and Zivkovic present a model-driven development process, explicitly considering interoperability levels as development process phases, in an interoperability-by-design approach. The approach is demonstrated by integrating BPMN-based business process modelling and CCTS-based data modelling into a consolidated modelling language, including model transformation capabilities. The application of this model-driven development process, the metamodel integration as well as the model transformation is illustrated by a case study of electronic VAT statement transaction. It has to be noted that this approach won the OMG/BP Trends 2009 worldwide competition.

Chapter 8
The Semantic Interoperability Centre Europe – Reuse and the negotiation of meaning
Aldo Laudi, Project Officer for SEMIC.EU, European Commission

Laudi presents a case of a centralised and collaborative approach to interoperability in public administration: SEMIC.EU, the Semantic Interoperability Centre Europe. SEMIC.EU, a running system at www.semic.eu, is a horizontal measure of the European Commission, implemented with the primary purpose of enhancing semantic interoperability in public administrations and projects across Europe. The chapter argues that, especially at a high level of administration like the European Commission and EU Member States, the guiding principles for common solutions to semantic interoperability coordination, must rely on the exchange of practices and community-based negotiation of purposes and meanings.

Chapter 9
A reference architecture for interoperable and adaptive processes
Marijn Janssen, Delft University of Technology, the Netherlands
Brian Snijders, H&P Management Consultancy & Training, the Netherlands
Frits Herkemij, H&P Management Consultancy & Training, the Netherlands

Janssen, Snijders and Herkemij present the interoperability problems and solutions in the handling of subsidy applications, a service that typically crosses several departments and organizations, each of them having their own heterogeneous applications and processes. The chapter proposes a reference architecture, used to ensure interoperability and to derive generic building blocks. The architecture is implemented and tested in practice by building a prototype based on web services technology. The evaluation shows applicability, adaptability and limitations of the proposed architecture, resulting in useful recommendations for administrations and enterprises.

Chapter 10
Interoperability – A Challenge of the EU Services Directive
Christian Breitenstrom, Fraunhofer Institute FOKUS, Germany
Klaus-Peter Eckert, Fraunhofer Institute FOKUS, Germany
Jens Fromm, Fraunhofer Institute FOKUS, Germany

The EU Services Directive (EU-SD), which was passed in December 2006, should simplify access to the services market in all Member States of the European Union and eliminate bureaucratic barriers for Service Providers. Breitnstrom, Eckert and Fromm present an overview of the major functional components and processes that are necessary to implement and run the EU-SD between all stakeholders such as Service Providers, newly introduced Points of Single Contact and Responsible Public Authorities, based on a general framework for federated enterprise SOA. The chapter elaborates on the interoperability aspect of data/document exchange between the stakeholders, using a secure "call by reference" concept that is implemented by an Electronic Safe, together with appropriate concepts for identity and access management.

Chapter 11
Provision of WEB 2.0 services by Interoperable GIS-powered Local Administration portal systems
Anastasios Tsitsanis, National Technical University of Athens, Greece
Sotirios Koussouris, National Technical University of Athens, Greece
Rob Peters, University of Amsterdam, The Netherlands

Tsitsanis, Koussouris and Peters are tackling interoperability in eGovernment systems for municipalities, a rather mature field when talking about the traditional and plain service delivery to citizens. In this field, the most modern implementations are already coming up with the utilisation of various Web 2.0 services in an attempt to become more attractive to the users and to gain a larger user base. The chapter presents components stemming from GIS technology, electronic participation electronic service portals in an attempt to prescribe the offering of added-value and more “personalised” services to users.

Chapter 12
Design and standardisation of Core Directories for e-Government
Heiko Hartenstein, Fraunhofer Institute of Open Communication Systems, Germany
Christian Welzel, Fraunhofer Institute of Open Communication Systems, Germany
Jörn von Lucke, Fraunhofer Institute of Open Communication Systems, Germany &
Zeppelin University Friedrichshafen, Germany

Hartenstein, Welzel and von Lucke present a new approach for Core Directories - content infrastructure elements for interoperable use in service oriented architectures. The chapter presents the design and research activities focused on specification, a generic approach, globally unique identification of objects and development of an example application. Key objective is the modernisation of the information technology used in and between administrations. The interdisciplinary approach presented is a challenge for the constitution of next generation e-Government networks. The chapter describes the strategic and operative standardisation activities, the concept of Core Directories and the example application service responsibility finder.

Chapter 13
Advancing Interoperability for Agile Cross-Organisational Collaborations: A Rule-Based Approach
George Gionis, National Technical University of Athens, Greece
Christoph Scroth, University of St. Gallen, Switzerland
Till Janner, SAP Research CEC St. Gallen, Switzerland

Gionis, Scroth and Janner present a comprehensive Model-Driven Architecture for enabling agile cross-organisational collaboration, in an international context, by integrating business and legal rules in private and collaborative processes, business documents and their resulting service orchestrations. The resulting framework, that was mostly developed and applied in the course of the EU-funded research project GENESIS, ranges from graphical process and data models and declarative rule structures to the technical specification of a hybrid software architecture for integrating rule with process and data models.

Chapter 14
A national interoperability approach for social services information management in Finland
Juha Mykkänen, University of Kuopio, HIS R&D Unit, Finland
Konstantin Hyppönen, University of Kuopio, Department of Computer Science, Finland
Pekka Kortelainen, The East Finland Social and Welfare Centre of Expertise, Finland
Antero Lehmuskoski, The East Finland Social and Welfare Centre of Expertise, Finland

Virpi Hotti, University of Kuopio, Department of Computer Science, Finland
Esa Paakkanen, University of Kuopio, HIS R&D Unit, Finland
Anneli Ensio, University of Kuopio, Department of Health Policy and Management, Finland

In this collective chapter, Mykkänen and co-authors introduce and discuss the approach for defining IT interoperability solutions on national level for social services in Finland. Goals and phases of the national initiative are presented, and various projects related to the transformation and unification of various aspects of supporting social services via interoperability solutions are illustrated. The authors, representing a number of Finnish organisations, highlight several success factors and issues for the organization of multipartite collaboration, the specification of architectural and information management approach, the selection and definition of technology standards to support the domain-specific information needs and specifications and strategic alternatives for central information repositories.

Section 3: Interoperability Semantics, Knowledge and Scientific Approaches

Chapter 15
Semantic Services for Business Documents Reconciliation
Michele Missikoff, Consiglio Nazionale delle Ricerche, Italy
Fabrizio Smith, Consiglio Nazionale delle Ricerche, Italy
Francesco Taglino, Consiglio Nazionale delle Ricerche, Italy

Missikoff, Smith and Taglino report about the ongoing activities in the COIN European research project, concerning semantic reconciliation of business documents for supporting interoperability of software applications in e-government and e-business scenarios. The approach is based on a reference ontology against which business documents are mapped through semantic annotation and building of reconciliation rules. The chapter includes a running example concerning the exchange of a legal verification document in a scenario of cross border cooperation between European chambers of commerce.

Chapter 16
Knowledge Interoperability of Parliaments' and Government Agencies' Information Systems
Loukis, Euripidis, University of Aegean, Greece
Xenakis, Alexandros, Panteion University,Greece

Chapter 16 is dealing with knowledge-level interoperability, aiming to support higher knowledge-intensive tasks of governments, such as the formulation of legislation and public policy. Loukis and Xenakis present an ontology-based methodology for achieving knowledge interoperability of IS of Parliaments and Government Agencies, so that they can exchange public policy related knowledge produced in the various stages of the legislation process. An application of the proposed methodology is presented, followed by evaluation, and a generalization which can be used for achieving knowledge interoperability among Information Systems of other types of administrations.

Chapter 17
Measuring the benefit of interoperability: A Business Process Modeling approach
Eleni Zampou, Athens University of Economics and Business, Greece
Stelios Eliakis, Athens University of Economics and Business, Greece
Katerina Pramatari, Athens University of Economics and Business, Greece

Zampou, Eliakis and Pramatari propose an approach for measuring the benefit of incorporating interoperability in e-government. The approach is based on the analysis of certain governmental processes through business process modelling combined with the activity based costing method. The proposed method is applied to the most frequent governmental services of the Greek Citizen Service Centres (KEP). Several quantified conclusions are drawn, in the direction of identifying the process steps that are the most critical and can be improved through a more interoperable governmental infrastructure.

Chapter 18
Equipping the Enterprise Interoperability Problem Solver
Paul Oude Luttighuis , Novay , The Netherlands
Erwin Folmer , TNO Information and Communication Technology & University of Twente, The Netherlands

Oude Littighuis and Folmer propose a scope and structure of an enterprise interoperability profession, by taking the enterprise interface as the pivotal concept. The chapter defines four perspectives on such interfaces: design, transaction, implementation, and suprastructure. These four perspectives house a range of issues, which can be tackled by the enterprise interoperability professional (or problem solver) by using models and instruments. The chapter finally identifies and classifies such models and instruments, while sketching how a collection of these tools can be implemented and used.

Chapter 19
Towards a Scientific Foundation for Interoperability
Yannis Charalabidis , University of the Aegean, Greece
Ricardo Jardim Gonçalves, New University of Lisbon, Portugal
Keith Popplewell, Coventry University, United Kingdom

Charalabidis, Goncalves and Popplewell address the issues of advancing interoperability into a more systematized practice. The chapter goes beyond the presentation of the main milestones in this fascinating quest for collaboration between people, systems and information: it attempts to describe how this new interdisciplinary research area can transform into a vivid scientific domain, by applying the necessary method and tools. To achieve that, the chapter presents the needed ingredients of this new science, proposes formal and systematic tools, explores the relation of interoperability with neighboring scientific domains and finally prescribes the next steps for achieving the thrilling goal of laying the foundations of a new science.