Semantic Interoperability Centre Europe

A Study on Good Practices in Existing Repositories

This Study on Good Practices in Existing Repositories has been prepared by

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PREFACE

ABOUT SEMIC.EU

SEMIC.EU is an action of IDABC (Interoperable Delivery of European eGovernment Services to public Administrations, Businesses and Citizens), a programme managed by the European Commission's Directorate-General for Informatics. Further information is available under www.semic.eu.

Contracted technical service providers for the project are:

-]init[(main contractor)
- Fraunhofer ISST
- GEFEG
- France Telecom R&D

ABOUT IDABC

IDABC stands for Interoperable Delivery of European e-Government Services to public Administrations, Businesses and Citizens. It uses the opportunities offered by information and communication technologies to encourage and support the delivery of cross-border public sector services to citizens and enterprises in Europe, to improve efficiency and collaboration between European public administrations and to contribute to making Europe an attractive place to live, work and invest. European Commission.

Directorate-General for Informatics

DIGIT/01 - European eGovernement services (IDABC)

http://europa.eu.int/idabc/

TYPOGRAPHICAL CONVENTIONS

The type styles shown below are used in this document to emphasize parts of the text.

Times New Roman – 11 pt.: Standard body text

Times New Roman – 11 pt. Italic: Citations

MANAGEMENT SUMMARY

Interoperability is a key factor for the implementation of pan-European eGovernment services. The questions of seamless data exchange between countries with different administrative, technical and linguistic background require considerations and solutions for the technical, semantic, and organisational dimensions of interoperability.

The IDABC programme (Interoperable Delivery of European eGovernment Services to public Administrations, Businesses and Citizens) of the European Commission addresses these challenges through coordinating common rules for collaboration and related infrastructure projects. The IDABC Semantic Interoperability Centre Europe – SEMIC.EU – project belongs to the IDABC horizontal measures. Its objective is to promote the harmonisation of interoperability assets that are the basis for cross-border e-Government services. More precisely, SEMIC.EU is supposed to promote the reuse of syntactic (e.g. XML schemas) and semantic assets (e.g. ontologies) needed for semantic interoperability. SEMIC.EU will provide these interoperability assets via a public web repository to interested stakeholders in European public administrations.

In order to build a catalogue of good practices and derive vital recommendations for the SEMIC.EU platform, a set of existing e-Government projects, which deliver similar services are examined in five steps.

1st Step	• Locating potential initiatives • Listing and short introduction
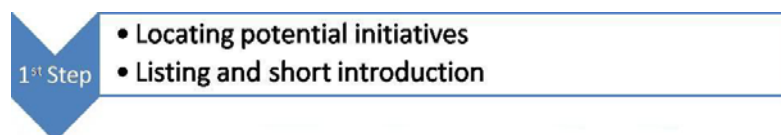
Therefore in step one of this study, a number of e-Government projects and initiatives have been identified in respect to their suitability to derive usable findings for the SEMIC.EU platform. Those projects have been chosen because of the fact of operating a repository, their potential relevance to the SEMIC.EU platform, an obvious outstanding performance in their sector or by its stable and robust operation in the e-Government environment.

2nd Step	• Checking projects' information for completeness • Compiling a list of key projects
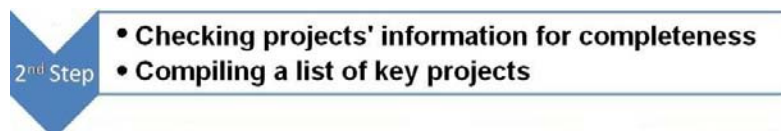
The second step consists of an examination of the group of identified projects. This inspection focuses on the gathering of information and on determining whether this information is suitable in order to derive appropriate results. Projects with incomplete or inaccurate information and initiatives with findings of marginal significance have been filtered out in this process to provide sharp and distinguished results.

3rd Step	• Defining criteria catalogue
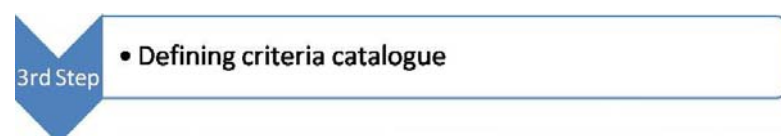
Step three identifies individual criteria for measuring outstanding performance, innovative approaches and usability. The particular findings of this stage have been compiled in a success criteria catalogue, which is used for the further evaluation within this study.

4th Step	• Analysing projects by applying criteria catalogue • Extracting "good-practices"
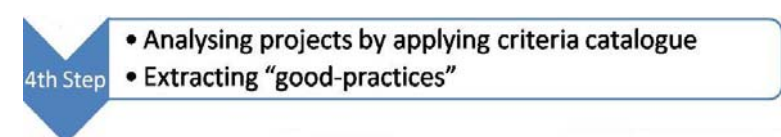
In step four, the refined list of projects – consisting of eleven key-player initiatives – is to be analysed in more detail and in order to fully comprehend the key success aspects which may turn out as beneficial for the SEMIC.EU platform. The criteria identified in step three are applied to the individual project in order to determine their success factors. This results in a list of "good practices". These good practices are the state-of-the-art requirements, which any current project needs to address and fulfil.

HINT: Readers primarily interested in the rather **general state-of-the-art good practices** of current e-Government projects and initiatives may directly refer to section five of this study.

5th Step • Deriving specific recommendations for SEMIC.EU

Step five derives recommendation specifically for the SEMIC.EU platform. Those recommendations can be seen as unique selling points for the SEMIC.EU platform which, when exploited to full extent, are of crucial importance to SEMICS' level of success.

HINT: Readers whose primary concerns are the **recommendations for** the SEMIC.EU platform may refer to section six of this study.

The identified recommendations for SEMIC.EU do not merely cover a technical point of view, but focus on operational and organizational issues. One prominent result of this study is that organisational and business criteria in particular are of upmost importance for the success of current projects. These criteria include political support, visibility requirements, and cooperation with other initiatives to ensure a return on investment of the SEMIC.EU platform.

However, not every recommendation is of same importance to the SEMIC.EU platform. In order to reflect a certain criterions importance adequately, the individual recommendations are explained in greater detail in order to provide adequate decision guidelines.

In brief, the recommendations for SEMIC.EU include:

- strive for strong political backing for SEMIC.EU
- place SEMIC.EU as a dedicated European level collaboration platform supplementing the national and domain-specific initiatives
- elicit flexible funding of the SEMIC.EU platform beyond the next two years
- strive for high visibility of SEMIC.EU
- intend tight coalitions and mediator role of SEMIC.EU with other related initiatives
- strive for a highly trusted platform for Member States, users, developers and providers by implementing open, free and transparent processes

Applying these recommendations may create synergy effects between all success factors leading to great opportunities for the SEMIC.EU platform.

1. INTRODUCTION

1.1. Scope

Interoperability between data and systems on both the semantic and syntactic layers is among the most important challenges of modern IT. Especially with e-Government services, the specific semantic interoperability is a precondition that has to be met in order to exchange data and services among countries with different languages and cultures. SEMIC.EU addresses both interoperability aspects: syntactic and semantic.

This study investigates the specific opportunities and issues of positioning SEMIC.EU as a platform for semantic interoperability in a European context. It identifies crucial success factors that need to be met and derives recommendations for SEMIC.EU. Due to general political conditions the focus of the recommendations mainly cover the period of the next two years. The long term goal of SEMIC.EU is, to be the central pan-European collaboration and exchange platform for e-Government semantic interoperability assets.

1.2. Approach

In order to establish semantic interoperability, various approaches can be chosen:

- providing collections of assets that either have proved to be interoperable in practice or fulfil certain predefined interoperability criteria. The collection can be realised as a more-or-less static catalogue, a registry for searching objects, a registry-repository combination for maintaining assets, or as a workbench that supports asset developers through the whole asset life cycle. Examples for this approach are the repositories already established by Member States like OIOXML in Denmark or RepXML in France.
- profiling existing standards or assets by describing their semantics of use for certain domains or use cases. An example of this approach is the CEN/ISSS eGov Focus Group initiative, which soon issues specifications that lay down how existing standards have to be used and combined in order to realise specific cross-institutional use cases.
- standardising meta layers that make a description of the syntax and semantics of assets possible. By interpreting the meta-layer information, assets can be transformed into an other syntax or semantic information can be extracted. Examples of this approach are ontologies, meta-data standards, attribute taxonomies, and template and schema languages (e.g. the XML Schema [XML XSD]).
- defining standards from mature assets that directly address semantic issues, e. g. by defining semantic element types. An example of this approach is the HL7 CDA standard in healthcare, which allows for modelling the semantics of documents and interaction within healthcare acts [HL7 CDA v3].

Like many other recent national and domain-bound initiatives, SEMIC.EU takes the "collection approach" for supporting interoperability with a focus on the pan-European level but for supporting the other levels as well. The collection approach can be combined with semantic standards, meta-layers, and profiling in order to improve users' abilities to catalogue and identify assets.

1.3. The Purpose of this Study

This study analyses other initiatives that implement a collection approach for enforcing the availability of interoperable building blocks for interoperable solutions. The main purpose is to identify "DOs and DONTs" for SEMIC.EU from these initiatives' experiences and to set up a candidate catalogue of functional features and non-functional quality measures that might be considered in order to make SEMIC.EU a successful platform.

Although the focus of this study clearly lies on dedicated repositories, projects, frameworks and initiatives of other characteristics haven been analysed as well. This was performed in order to derive results and findings of a more general nature.

The concept of a "successful platform" demands considerations regarding measurements of this success. As a web-based catalogue, SEMIC.EU depends heavily on network effects: the more users register useful assets on the platform, the more users will be attracted to use assets from SEMIC.EU within their projects – and the more the assets from SEMIC.EU are reused, the more users will be attracted to place new assets there. Thus SEMIC.EU will be successful if it attracts a critical mass of users by being usable, attractive, and visible.

Usability, attractiveness, and visibility are among the goals of all the related projects in Europe and beyond. Some have reached these goals, but many more have not. Another objective of this study is to learn from both kinds of projects and to obtain an idea of why some were successful while others were not. In doing so, there are three major questions for which this study needs to provide answers:

- What are the DOs and DONTs on a basic level that will ensure that SEMIC.EU does not fall below a quality level already established by comparable asset catalogues?
- How can early adaptors be attracted and a penguin effect achieved? Being good in most cases is not enough to reach a critical mass. Therefore, other success factors of successful projects have to be investigated and mapped onto SEMIC.EU. These success factors have to be identified.
- Besides the specific purpose of addressing pan-European interoperability, what are the singular features that provide added value for the platforms users?

1.3.1. Target Groups and Audience

This study is aimed at all parties with any interest in design principles for a pan-European network, the coordination of such a network, and a collaboration platform for e-Government interoperability assets.

1.4. Key Considerations of this Study

Key considerations about the desired clearing process outcome and the characteristics of good practices constitute the foundation of this study. These considerations have already been formulated as part of the SEMIC.EU Global Implementation Plan (GIP). The following sections summarize these considerations, which are helpful for understanding the motivation of SEMIC.EU in general and this study in particular.

1.4.1. Interoperability over Standardization

Interoperability[1] can be achieved in many different ways: a certain degree can be established by fostering bilateral and multilateral solutions and suitable mappings, thus eliminating the need for a single information standard.

In other fields of standardisation, the situation is quite similar. There are, for instance, multiple national standards for electric plugs in the EU. However, given a set of adapters, it is still possible to achieve interoperability. The same holds for data exchange. As long as data can be exchanged in a meaningful way among all relevant communication partners, an agreement on a unified standard is not necessary. It is even possible to agree on the exchange of incomplete or inconsistent information. As long as all communication partners are aware of the consequences, this does not contradict the idea of interoperability.

Creating a standard, in contrast, requires unanimous agreement of all partners involved. In order to receive the necessary acceptance, standards have to be created and enforced by an institution with adequate authority. Given the numerous different economic, legal, and cultural backgrounds of the

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[1] The EIF defines interoperability as the ability of information and communication technology (ICT) systems and the business processes they support to exchange data and to enable the sharing of information and knowledge.

Member States, achieving interoperability without standards is the most efficient solution. SEMIC.EU will promote and encourage standardisation and harmonisation efforts, but its main focus will be ensuring interoperability in the best way possible.

1.4.2. "Good Practices"

No precise, concrete scientific definition of so-called "good practices" exists. However, due to the fact that this expression is widely used, factors that describe the nature of good practices have been collected and presented here. Good practices generally solve a given problem by incorporating well-known and well-tested approaches that have been applied successfully by other developers. Good practices may describe technical, organizational, or operational aspects of projects or simply successful approaches to solving problems.

1.5.   Study Approach

Since SEMIC.EU focuses on providing a structured, searchable catalogue of assets, this study examines related activities in:

- national and domain-specific asset catalogues
- e-Government Frameworks
- e-Government Integration Frameworks
- domain-specific interoperability platforms
- standardisation committees

In a first step, the current e-Government environment has been examined in order to locate projects and initiatives which seem to be suitable for deriving concrete good practices and results for the SEMIC.EU platform. Those projects and initiatives have been compiled into an informative list, where every project is briefly introduced and presented. An Overview of the initiatives and their specific key data is given in section two of this study.

1st Step
- Locating potential initiatives
- Listing and short introduction

2nd Step
- Checking projects' information for completeness
- Compiling a list of key projects

3rd Step
- Defining criteria catalogue

4th Step
- Analysing projects by applying criteria catalogue
- Extracting "good-practices"

5th Step
- Deriving specific recommendations for SEMIC.EU
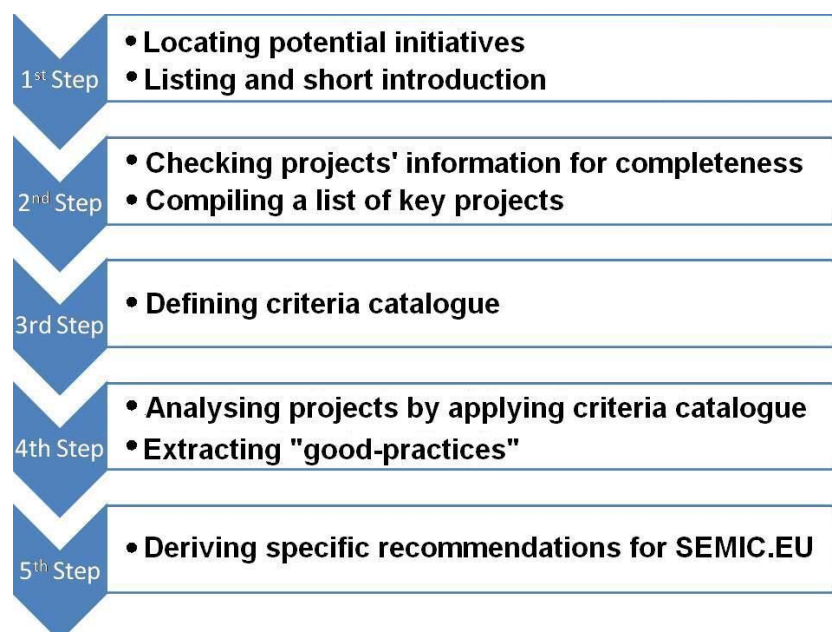
Figure1-1: Studies approach and methodology

The second step examines the projects and initiatives located in step one in greater detail in order to gather further detailed information. This step includes external sources as well as the official project presentation means. The projects are evaluated by this more detailed information and – as a result – projects with incomplete information or information which is not beneficial for the launch of the SEMIC.EU platform, have been filtered out in this step.

Step three firstly compiles a list of performance criteria by which the remaining projects and initiatives are to be evaluated. Those performance criteria are categorised into the criteria catalogue and introduced in the first part of section three. The composition of the criteria catalogue is primarily aligned onto widely-used standards, such as the ISO 9126-2:2003[2] and the ISO 10746-3:1996[3].

In step four, the criteria catalogue is applied onto the project list of step two. This is performed in order to identify projects or initiatives with an outstanding performance. Those are the main study objects of which usable results for the SEMIC.EU platform can be extracted. The evaluation is performed by using comparison charts. Those charts form the basis for the in-depth analysis.

The description of the good practices identified in the in-depth analysis is twofold: First, this step presents the key projects in great detail emphasising the good practices that appeared most noticeably in the particular project. This is also done in order to provide further background information for the studies audience. These projects are the source of any derived results; therefore it is vital to inform the audience of this study about the specific details of those "top-of-the-class" projects.

After the detailed project presentation the so-called "good practices" are extracted, i.e. an explicit description of each of these good practices is provided. These good practices reflect general requirements any project usually needs to fulfil in order to be launched and operated successfully.
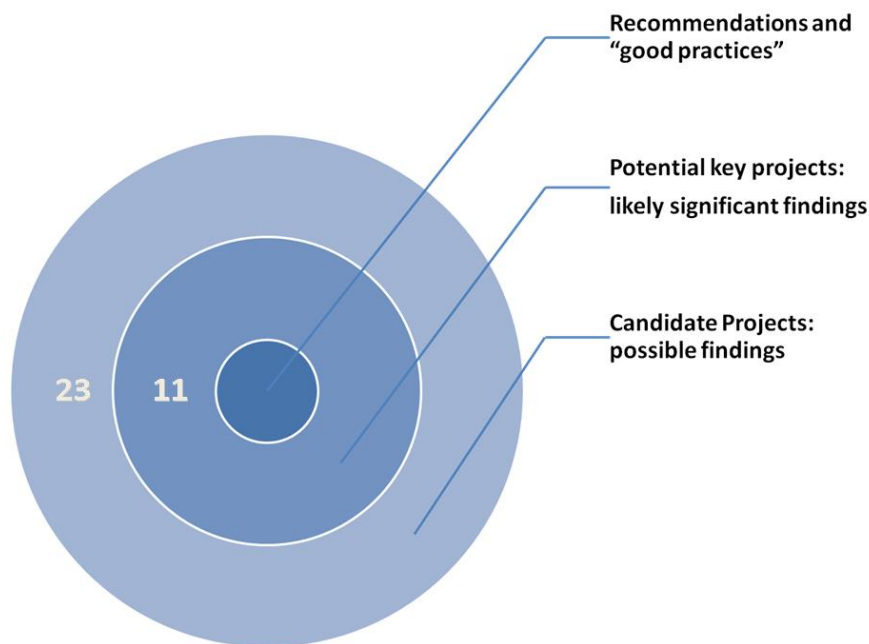
Figure1-2: Study Relations

However, these identified good practices reflect state-of-the-art technologies and approaches, which means that those are neither innovative nor do they represent unique selling points but are commonly used within the e-Government sector. The SEMIC.EU platform however features potential unique selling points which need to be exploited in order to unfold the full potential of the SEMIC.EU vision and opportunities.

In step five these crucial recommendations of aspects to be exploited, conclude this study and are compiled in section six of this document.

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[2] http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=22750
[3] http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=20697

2. STEP 1: OVERVIEW OF CURRENT ACTIVITIES & INITIATIVES

The first step of this study consists primarily of scanning the European activities in the e-Government sector in order to locate any projects / initiatives related to SEMIC.EU. The collection of potential initiatives from Europe, Asia, North America and international standardisation organisations led to a list of 23 projects. The reason for choosing a particular project is, that a given project meets one or more of the following criteria:

- the project / initiative is including a repository
- the project is related to SEMIC.EU in terms of intention and topic or
- the project features an innovative approach to solve problems, that we may learn of
- the project provides e-Government services of international reputation

Though focussing on repository projects and the e-Government sector, initiatives were taken into account that address issues that are important for SEMIC.EU as well. So standardisation initiatives were considered because they incorporate an adjustment and approval process similar to SEMIC.EU.

Though this selection of projects aims at being representative, it does not claim to be a comprehensive collection of projects fulfilling the criteria described above. Prominent projects / initiatives may be missing if rather similar projects / initiatives are among the selected ones. At this stage, no quality assessment of any project / initiative is performed.

The following excerpts are either quotes of the original web pages or taken from the deliverables of the particular project. The use of external quotations is indicated by double quotes.

2.1. Current European Activities

2.1.1. Access to e-Government Services Employing Semantic Technologies (Access-eGov)

Objectives

The goal of the EU-funded Access-eGov project is "support for semantic interoperability among e-government services across organisational, regional and linguistic borders by employing semantic technologies."

Technical Functionalities & Approach

Access-eGov will provide two kinds services:

- "a meta-service – depending on the needs and context of the user Access-eGov will find/ identify traditional and/or e-government services relevant to the given life event or business episode"
- A generation mechanism that produces a "scenario consisting of elementary government services. Usually these scenarios will be of 'hybrid' nature – i.e. combination of elementary traditional and e-services - realisation of which leads to a requested outcome (e.g. to get a new driving license)".

Access-eGov is based on a peer-to-peer network with each peer designed using the paradigm of a service-oriented architecture. Semantic interoperability is addressed by ontology-based orchestrating of service interfaces.

Potential Beneficiaries

- ▪ "To improve accessibility and connectivity of governmental services for citizens and businesses.
- ▪ To simplify the use of government services for users - by means of creating integrated hybrid scenarios and providing guidance to users while following this scenario."

Achievements

Public deliverables available so far comprise requirements and design documents as well as guidelines. The system will be validated in projects in Slovakia, Poland, Germany and Egypt.

Key Data

Project start date	January 2006
Project completion date	December 2008
Budget / Funding	2.279.243 €/ 1.983.000 €
Service in charge	Technical University of Kosice
Action manager	Tomáš Sabol,
Contact	tomas.sabol@tuke.sk
Countries involved	Egypt, Germany, Greece, Poland, Slovakia
Public websites	http://www.accessegov.org/
Project status	Ongoing

Documentation

AccessGov,
http://www.accessegov.org/acegov/uploadedFiles/webfiles/cffile_1_11_07_8_46_10_PM.pdf

2.1.2. ARTEMIS

Objectives

ARTEMIS (A Semantic Web Service-based P2P Infrastructure for the Interoperability of Medical Information Systems) is an EU-funded research project. Among the project's objectives is providing solutions in the domains of "eHealth, Interoperability of Medical Information Systems, Web services for the medical domain, Semantically enriched Web services for the healthcare, Web Service registries, Semantic mediation of Healthcare ontologies, P2P Technologies for the discovery of healthcare services."

Technical Functionalities & Approach

The approach followed in the ARTEMIS project is based on semantically enriched Web Services based on medical standards such as HL7 and existing reference models.

Potential Beneficiaries

ARTEMIS enables interoperability in different application contexts in the exchange of medical data as "Interoperability of the healthcare messages exchanged and interoperability of electronic healthcare records".

Achievements

 "One of the main objectives of the project is to develop the infrastructure necessary to make medical information systems interoperable based on the Web services. For this purpose the end users of the Artemis project developed Web services for exposing their existing healthcare applications and patient data. These Web services are integrated to the ARTEMIS first prototype."

Key Data

Project start date	January 2004
Project completion date	June 2006
Budget / Funding	2.957.604 €/ 1.989.000 €
Service in charge	Software R&D Center, Middle East Technical University
Action manager	Prof. Dr. Asuman Dogac
Contact	asuman@srdc.metu.edu.tr
Countries involved	Germany, Greece, Turkey, UK
Public websites	http://www.srdc.metu.edu.tr/webpage/projects/artemis/
Project status	Completed

Documentation

Dogac, A., Laleci, G., Kirbas S., Kabak Y., Sinir S., Yildiz A., Gurcan Y. "Artemis: Deploying Semantically Enriched Web Services in the Healthcare Domain", Information Systems Journal (Elsevier), accepted for publication. (Science Citation Index Core, Impact Factor: 03.327)

Bicer, V.,Laleci, G.,Dogac, A., Kabak, Y., "Artemis Message Exchange Framework: Semantic Interoperability of Exchanged Messages in the Healthcare Domain" ACM Sigmod Record, Vol. 34, No. 3, September 2005. (Science Citation Index Expanded, Impact Factor: 00.675)

Mike Boniface, Paul Wilken, "ARTEMIS: Towards a Secure Interoperability Infrastructure for Healthcare Information Systems", accepted to Healthgrid2005.

2.1.3. BRITE

Objectives

"BRITE - Business Register Interoperability Throughout Europe – is an Integrated Project (IP) funded by the European Commission, DG Information Society & Media. This project, which involves a consortium of nineteen organisations including European Business Registers and Chambers of Commerce, IT Companies, Universities, and SMEs, aims to develop, implement, and demonstrate an advanced, innovative interoperability model, an ICT service platform, and management instruments for Business Registers (BRs) to interact across the EU."

Technical Functionalities & Approach

The BRITE approach is based on domain ontologies to enforce semantic interoperability on the interface level. Further key technologies used are process ontologies and services to address the integration of different functionalities and processes.

Potential Beneficiaries

- eliminating administrative barriers to the freedom of establishment and of movement of companies;
- the advancement, development and adoption of adaptive and proactive e-Government support systems;
- instilling a proactive and positive attitude to change, innovation and service provision in public bodies;
- advancing the state of the art in the modelling of administrative processes using ontology and semantic web languages;

- informing the EU legislative and policy planning/road-mapping process by producing monitoring data and indicators showing how changes in EU legislation impact cross border/cross-domain administrative processes and public services;
- standards development both in the ICT domain and the Company Law domain;
- facilitating the transfer of e-Government R&D ICT and know-how between public bodies.

Achievements

There are some project deliverables available via http://www.briteproject.net/modules/news/. Most of them .are project presentations.

Key Data

Project start date	March 2006
Project completion date	March 2009
Budget / Funding	10.585.355 €/ 6.300.000 €
Service in charge	European Business Register
Action manager	Gianella, Vito
Contact	info@briteproject.net
Countries involved	Belgium, Denmark, Germany, Ireland, Italy, Norway, Spain, Sweden
Public websites	http://www.briteproject.net
Project status	Ongoing

Documentation

Ludger van Elst, Bertin Klein, Heiko Maus, Harald Schöning, Alessandro Tommasi, Cesare Zavattari, John Favaro, and Vito Giannella: Business Register Interoperability Throughout Europe: The BRITE Project, http://www.imu.iccs.gr/sweg/papers/SS0606vanElstL.pdf

2.1.4. Deutschland-Online / XRepository

Objectives

"Deutschland-Online is Germany's national eGovernment strategy pursued by the federal government, federal-state governments and municipal administrations." Deutschland-Online strives to create "a fully integrated eGovernment landscape in Germany. The necessary standards are set and the strengths of federalism are put into practice in that individual partners lead the way with model solutions which also benefit others (the "one or some for all" principle). In this way, uniform and consistent online services are enabled across all administrative levels."

Technical Functionalities & Approach

The XRepository is a central repository for domain-specific and domain- independent data models. In particular, the XRepository will serve as the central repository for the XÖV core components that will be developed in Deutschland Online projects and will be standardized by a Deutschland Online standardisation committee (called the 'Datenkonferenz' in German).

The XRepository will be based on the Open Source Software freebXML Registry.

Potential Beneficiaries

By a uniform communication infrastructure and standardised data exchange formats electronic cooperation between the different administrative levels will be facilitated.

Other projects are directly orientated towards the needs of businesses and citizens.

Achievements

Projects addressing infrastructure and standardisation as well as sectoral projects have been started. The production phase of the XRepository is planned to begin in May 2008.

Key Data

Intiative start date	Internal launch of XRepository January 2008, Production phase planned to begin May 2008
Initiative completion date	No completion planned
Budget	Not publicly available
Service in charge	Deutschland-online office, Federal Ministry of the Interior
Action manager	Deutschland-online office, Federal Ministry of the Interior
Contact	http://www.deutschland-online.de/DOL_Internet/broker.jsp?uMen=68e70293-553f-4011-aeb6-df14b826c994
Countries involved	Germany
Public websites	www.deutschland-online.de
Initiative status	Ongoing

Documentation

Aktionsplan (actionplan) Deutschland Online vom 14.6.2007,
http://www.deutschland-online.de/DOL_Internet/binarywriterservlet?imgUid=3d71060b-9a89-5311-4fbf-1b1ac0c2f214&uBasVariant=22222222-2222-2222-2222-222222222222

2.1.5. e-GIF

Objectives

The e-Government Interoperability Framework (e-GIF) is a crucial part of the British e-Government Strategy: "Adherence to the e-GIF policies and specifications is mandatory."

"The e-GIF defines the technical policies and specifications governing information flows across government and the public sector. These cover interconnectivity, data integration, e-services access and content management."

Technical Functionalities & Approach

"The e-Gif architecture contains:

- the framework, which covers high-level policy statements, technical policies and management, implementation and compliance regimes
- the e-GIF registry, which covers the e-Government Metadata Standard (e-GMS) and Government Category List (GCL), the Government Data Standards Catalogue (GDSC), XML schemas, the Technical Standards Catalogue (TSC) and the e-Services Development Framework (e-SDF)."

Potential Beneficiaries

"It is a pragmatic, Internet based approach for reducing cost and risk. It frees up public sector organisations to concentrate on serving the customer through value added information and services."

Achievements

See Technical Functionalities & Approach.

Key Data

Intiative start date	September 2001 first version of the e-GIF core document
Intiative completion date	No completion planned
Budget / Funding	Not publicly available
Service in charge	Cabinet Office (UK)
Action manager	Not publicly available
Contact	http://www.cabinetoffice.gov.uk/ContactUs/Feedback.aspx
Countries involved	UK
Public websites	http://www.govtalk.gov.uk/
Intiative status	Ongoing

Documentation

e-Government Interoperability Framework Version 6.1,
http://www.govtalk.gov.uk/documents/eGIF%20v6_1(1).pdf

2.1.6. ITAIDE

Objectives

The EU-funded Information Technology for Adoption and Intelligent Design for E-Government (ITAIDE) project addresses issues related to eCustoms. "ITAIDE develops a Common Information Model for electronic documents and document mapping software to improve the pan-European interoperability of taxation and customs systems."

Technical Functionalities & Approach

ITAIDE covers five main areas:

- Standardisation: systematising eForms and building an Extended Core Components Library
- Interoperability: "application interoperability with and between main vendors"
- Control and redesign: "inter-organizational control mechanisms"
- Network Innovation: "novel modes of multi-organizational innovation"
- Value Assessment: "provide a set of performance indicators to monitor eGovernment and eBusiness"

Potential Beneficiaries

"European governments aim to achieve the twin objectives of trade facilitation as well as secure and controlled import and export by developing and implementing Single Window and Authorized Economic Operators. Improving pan-European interoperability is a key prerequisite.

Single Window services are intended to enable businesses to conduct all interactions with customs via one point (preferably online). Authorized Economic Operators are certified businesses that because they can constantly show that they are secure, are granted simplification of their Customs interactions. Pan-European interoperability means that eCustoms solutions across Europe are compatible with each other, both at a technical and semantic level."

Achievements

"The research conducted in the project is grouped around 4 Living Labs. Each of these Living Labs provides a real-time, real-life research setting where we develop and pilot our practical solutions and theoretical frameworks."

- Beer Living Lab (Netherlands)
- Paper Living Lab (Finland)
- Food Living Lab (Denmark)
- Drug Living Lab (Germany/ Ireland)

Key Data

Project start date	January 2006
Project completion date	June 2010
Budget / Funding	7328163 €/ 5799981 €
Service in charge	Information Management Group Dept. of Economics and Business Administration, Free University Amsterdam
Action manager	Tan, Yao-hua
Contact	ytan@feweb.vu.nl
Countries involved	Denmark, Finland, Germany, Ireland, Netherland, Slovenia, Switzerland
Public websites	www.itaide.org
Project status	Ongoing

Documentation

Van Stijn, E., Björn-Andersen, N., Razmerita, L. and Henriksen, H.Z. (2007) Improving international eCustoms: The European ITAIDE initiative. Paper for the International Conference on the Digital Society (ICDS2007), Guadeloupe (France),

http://www.itaide.org/Projects/434/ITAIDE%20scientific%20publications/Conference%20papers/Van%20Stijn%20et%20al_improving%20international%20ecustoms.pdf

2.1.7. OIOXML

Objectives

The Danish Ministry of Science, Technology and Development, in cooperation with the public sector XML Committee initiated the OIOXML (Open public Information Online XML) project including the InfoStructureBase (ISB) repository as a strategic part of the Danish e-Government Project.

Technical Functionalities & Approach

ISB "is a collaboration tool" that supports "exchange and reuse of data related to public and private service delivery, including cooperation, business re-engineering and alignment of related services. The ISB is also intended to be of value to users outside the Danish public sector and is open for use for all, both public and private as well as Danish and non-Danish users."

"The infostructurebase contains four sections:

- An Infosite delivering information about standardization initiatives and communities.
- An international standards repository containing business process descriptions, datamodel descriptions, interface descriptions, complex XML schemas and schema fragments (information object) from public and private organizations.
- A Forum for discussions in relation to XML, Web Services and other relevant SOA issues.
- An UDDI repository containing information on services."

ISB provides a three-step approval process for XML Schemas directed by the Danish XML Committee. "Schemas compliant to OIOXML receive the appropriate credential according to their purpose and use." OIOXML Naming and Design Rules (OIOXML NDR) provide guidelines for defining OIOXML compliant XML Schema.

Potential Beneficiaries

"Standardisation has the potential to facilitate the ability to use and re-use data over the long-term, with no lock-in to proprietary tools or undocumented formats." Since January 2008, the use of OIOXML is mandatory for the Danish public administration.

Achievements

The ISB is a mature repository featuring rich functionality including advanced search facilities, a test section, a WSDL tool and Web services. ISB contains several thousand entries.

Key Data

Initiative start date	2001
Initiative completion date	No completion planned
Budget	Not publicly available
Service in charge	National IT and Telecom Agency Att: IT Strategic Office
Action manager	Not publicly available
Contact	http://isb.oio.dk/info/ContactUs
Countries involved	Denmark
Public websites	http://oio.dk, http://isb.oio.dk/info
Initiative status	Ongoing

Documentation

See http://isb.oio.dk/Info/Articles/ISB%20Articles.htm

2.1.8. OneStopGov

Objectives

OneStopGov is an EU-funded research project whose aim is "to specify, develop and evaluate a life-event oriented, integrated, interoperable platform for online one-stop government. This platform will be accompanied by a coherent framework for realising and exploiting online one-stop government at all levels".

Technical Functionalities & Approach

The OneStopGov approach comprises a life-event ontology and a set of life-event reference models that will be integrated in a platform and framework.

On the technical level the framework will provide "Service configuration modules for automated or semi-automated communication between Domain Ontology, Data Sources and Application Logic."

Potential Beneficiaries

OneStopGov will provide "single point access to public services that are integrated around citizens needs (usually life-events)."

Achievements

There will be four pilot implementations of the framework in Slovenia, Hungary, Poland and Romania with realisations of sixteen life events.

Key Data

Project start date	January 2006
Project completion date	June 2008
Budget / Funding	3.080.065 €/ 2.115.000 €
Service in charge	University of Macedonia, Economic and Social Sciences
Action manager	Tarabanis, Konstantinos
Contact	kat@uom.gr
Countries involved	Greece, Hungary, Italy, Romania, Poland, Slovenia
Public websites	http://www.onestopgov-project.org/
Project status	Ongoing

Documentation

Efthimios Tambouris, Mirko Vintar and Konstantinos Tarabanis (2006) "A life-event oriented framework and platform for one-stop government: The OneStopGov project", Proceedings of Eastern European eGov days conference. (19-21 April, Prague), http://www.onestopgov-project.org/index.php?name=Web_Links&req=visit&lid=309

2.1.9.   OntoGov

Objectives

Ontology-enabled eGovernment Service Configuration (OntoGov) was an EU-funded research and development project whose aim was to "develop and validate a platform that should facilitate the consistent composition, reconfiguration and evolution of e-government services".

Technical Functionalities & Approach

The OntoGov approach was based on semantic-web-services technology and standards (OWL-S and WSMO). The project defined three kinds of ontologies:

- "Meta ontologies;
- Domain-oriented ontologies;
- Administration ontologies.

The Meta Ontologies define the schema i.e. the language for modelling the e-Government services. The Domain-oriented Ontologies model the concrete e-Government services and all data relevant for these services. The main ontology of this cluster is the so-called Service Ontology that represents the e-Government services. Since the goal of the OntoGov project is to enable better management of e-Government services, we have introduced the Administration Ontologies."

Potential Beneficiaries

- "To provide the public administrations with a means that enables them,
- to have an overview of their current service configuration model and easily reconfigure it, whenever required,
- to provide the end-users with knowledge enhanced e-government services that will be simplified and more user-friendly."

Achievements

- An ontology editor for modelling domain ontologies of public administrations
- An ontology management system for managing the life-cycle of domain ontologies.
- A service configuration system for configuring and re-configuring service provision and for interconnecting the ontology management system with the existing applications and data sources of public administrations.

Key Data

Project start date	January 2004
Project completion date	June 2006
Budget / Funding	3.711.299 €/ 1.710.000 €
Service in charge	Planet S.A.
Action manager	Dimitrios Apostolou
Contact	dapost@planet.gr
Countries involved	Germany, Greece, Spain, Switzerland
Public websites	http://www.ontogov.com/
Project status	Completed

Documentation

Efthimios Tambouris, Stelios Gorilas, Gregory Kavadias, Dimitris Apostolou, Andreas Abecker, Ljiljana Stojanovic and Gregory Mentzas, Ontology-enabled e-Gov Service Configuration: An Overview of the OntoGov project, http://www.hsw.fhso.ch/ontogov/documents/brochureJPG.zip

2.1.10. RepXML

Objectives

RepXML is an XML repository operated by the EDIFRANCE association, with France Telecom and SRCI as technical partners. "The objective of the RepXML project is to provide the business sectors in France with technology neutral, reusable, standard eBusiness data", which are termed 'Business Specifications' (BS). "RepXML can be used to create, validate these data (conformity to the ebXML framework - ISO 15000), or to view/retrieve already approved eBusiness data."

Technical Functionalities & Approach

"The key features of RepXML are

- RepXML is CCTS compliant
- RepXML uses freebXML (reference implementation of the ebXML standard)
- RepXML implements the Naming and Design Rules v1.1 UN/CEFACT specification
- Download the BSs in PDF, ZIP, XMI and XSD format
- Export section from the component view includes XSD generation"

Access to RepXML via the web is open to the public. To be able to submit content to the repository, member access is necessary; it can be obtained without any restrictions. Specific RepXML functionality supports the submission of content to the repository. BSs undergo an approval process through a validation authority.

Potential Beneficiaries

Though the focus of RepXML is on eBusiness, the repository may provide standard eGovernment data as well.

Achievements

"RepXML is currently used in a field trial where user feedback will be very important in order to provide a future operational service." So far, nine companies have submitted content to the repository, and fifteen BSs have been validated.

Key Data

Initiative start date	2003
Initiative completion date	No completion planned
Budget / Funding	Permanent Funding
Service in charge	EDIFRANCE Association
Action manager	Not publicly available
Contact	ProjetRepXML@rd.francetelecom.com
Countries involved	France
Public websites	www.repxml.org
Initiative status	Field trial

Documentation

RepXML Presentation (only fr version),
http://194.199.139.28/RepXMLWeb/servlet/DownloadServlet?fileName=RepXML-HICC-EDIFRANCE-V2-02122004.pdf

2.1.11. RIDE

Objectives

"RIDE is a roadmap project for interoperability of eHealth systems leading to recommendations for actions and to preparatory actions at the European level. This roadmap will prepare the ground for future actions as envisioned in the action plan of the eHealth Communication COM 356 by coordinating various efforts on eHealth interoperability in member states and the associated states. Since it is not realistic to expect to have a single universally accepted clinical data model that will be adhered to all over the Europe, the RIDE project will address the interoperability of eHealth systems with special emphasis on semantic interoperability."

Technical Functionalities & Approach

RIDE addressed "interoperability of the messages exchanged between healthcare applications, interoperability of Electronic Healthcare Records (EHRs), interoperability of patient identifiers, coding terms, clinical guidelines and healthcare business processes." Syntactic interoperability as well as semantic interoperability was taken into account.

Potential Beneficiaries

RIDE potentially raises syntactic and semantic interoperability for data transfer in different eHealth application contexts.

Achievements

The project resulted in recommendations for actions and preparatory actions according to the project objectives.

Within the scope of the RIDE project, an interoperability scenario was implemented integrating different approaches (IHE XDS, ATNA, PIX and CT Profiles).

Key Data

Project start date	January 2006
Project completion date	December 2007
Budget / Funding	1.156.269 €/1.156.269 €
Service in charge	Director of Software Research & Development Center Middle East Technical University, Ankara, Turkey
Action manager	Prof. Dr. Asuman Dogac
Contact	asuman@srdc.metu.edu.tr
Countries involved	Belgium, France, Germany, Greece, Ireland, Italy, Turkey
Public websites	http://www.srdc.metu.edu.tr/webpage/projects/ride/index.php
Project status	Completed

Documentation

Dogac A. ,Namli T., Okcan A., Laleci G., Kabak Y., Eichelberg M., Key Issues of Technical Interoperability Solutions in eHealth and the RIDE Project, eChallenges Conference, The Hague, The Netherlands, October 2007,
http://www.srdc.metu.edu.tr/webpage/projects/ride/publications/eChallengesRide2007.pdf

2.1.12. SAKE

Objectives

"SAKE - Semantic-enabled Agile Knowledge-based eGovernment (IST 027128) is a research project realised by an international consortium of partners, co-financed from the 6th Framework Programme for Research and Technological Development."

Technical Functionalities & Approach

The SAKE approach addresses the need for permanent change of e-Government systems

The approach comprises a framework consisting of three semantic-based components, which are aimed at supporting agile knowledge management:

- an attention management system for providing the user with information on changes using push and pull mechanisms
- a content management system, based on several ontologies
- a groupware system

Potential Beneficiaries

- Delivery of the information required by the knowledge worker proactively
- Delivery of those documents to the public officer which are exactly relevant for its current task retrieved from the knowledge resources
- Assignment of the tasks and processes and overall collaboration and joint work of the public officers based on mechanisms for finding proper employees or experts for the particular tasks or activities

Achievements

Up to now several deliverables are provided via the web site, especially specification of the (basic) functionality of the systems under development.

Key Data

Project start date	March 2006
Project completion date	February 2009
Budget / Funding	2.547.836 €/ 1835786 €
Service in charge	Planet S.A.
Action manager	Dimitrios Apostolou
Contact	dapost@planet.gr
Countries involved	Germany, Greece, Hungary, Poland, Slovakia
Public websites	www.sake-project.org
Project status	Ongoing

Documentation

Semantic enabled Agile Knowledge-based E-Government SAKE,
http://www.sake-project.org/fileadmin/brochures/brochure.pdf

2.1.13. SemanticGov

Objectives

The EU-funded SemanticGov project "aims at building the infrastructure (software, models, services, etc) necessary for enabling the offering of semantic web services by public administration (PA). SemanticGov addresses "achieving interoperability amongst PA agencies both within a country as well as amongst countries, easing the discovery of PA services by its customers, facilitating the execution of complex services often involving multiple PA agencies in interworkflows".

Technical Functionalities & Approach

"To achieve this SemanticGov project aims at capitalizing on the Service Oriented Architectures paradigm, implemented through Semantic Web Services technology and supported by reusable public administration domain analysis and modelling."

"The SemanticGov infrastructure consists of:

- The Needs-to-Services facilitator (N2S facilitator)
- The National PA Service Directory (NPASD)
- The Distributed Business Process Manager (DBPM), as the infrastructure for on-the-fly, semi-automated composition, execution, and monitoring of complex PA Services
- The PA Ontology Server, as the knowledge infrastructure that manages the PA domain models"

Potential Beneficiaries

- "Identify the needed services by providing an infrastructure for mapping citizen needs to PA services.
- Discover the service of interest through a Federal/National PA Service Directory.
- Execute and monitor the service workfl ow by providing an infrastructure for on-the-fl y, semiautomated composition, execution and monitoring of complex PA Services."

Achievements

The deliverables available so far mainly address requirements and components design.

Key Data

Project start date	March 2006

Project completion date	February 2009
Budget / Funding	4.375.000 €/ 2.720.000 €
Service in charge	Centre for Research and Technology Hellas
Action manager	Tarabanis, Konstantinos
Contact	kat@uom.gr
Countries involved	Austria, Bulgaria, Germany, Greece, Ireland, Italy, Netherlands
Public websites	http://www.semantic-gov.org/
Project status	Ongoing

Documentation

Providing Integrated Public Services to Citizens at the National and Pan-European level with the use of Emerging Semantic Web Technologies (SemanticGov),
http://www.semantic-gov.org/index.php?name=UpDownload&req=getit&lid=30

2.1.14. SmartGov

Objectives

The aim of the EU-funded SmartGov project was "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."

Technical Functionalities & Approach

- The specification and development of 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 of 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."

Potential Beneficiaries

- Enabling "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.
- Providing "end-user public services accessible by all.
- Enabling Public Sector Agencies to "break down boundaries and reduce transaction costs not only between citizens and their governments but between levels of government as well."

Achievements

"The SmartGov project specified, implemented, deployed and evaluated an integrated, open and extensible platform for creating online, transactional, e-government 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"

The platform was evaluated at the participating public authorities concerning technical acceptability, usefulness and social / organisational acceptability.

Key Data

Project start date	February 2002
Project completion date	January 2004
Budget / Funding	3.202.328 €/ 1.950.001 €
Service in charge	e-Gov Lab Department of Informatics and Telecommunications University of Athens
Action manager	Dr. George Lepouras
Contact	G.Lepouras@di.uoa.gr
Countries involved	Germany, Greece, Spain, UK
Public websites	http://www.smartgov-project.org/
Project status	Completed

Documentation

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

A Governmental Knowledge-based Platform for Public Sector Online Services – Final Project Report, http://www.smartgov-project.org/deliverables/D13/SmartGov_D13_UoA_v03.pdf

2.2.   Current North American Activities

2.2.1. CORE.GOV

Objectives

The American government's CORE.gov service "grew out of the Federal Enterprise Architecture Project Management Office" and provides a collaboration environment for component development, sharing, registration, and reuse. This environment also features an open registry / repository for components and services.

The key objectives of CORE.gov are to optimize cross-agency collaboration significantly and to effect a government-wide service improvement.

Technical Functionalities & Approach

The platform is divided into five sections:

- Component Resources
  This section lists approved components and provides a "certification process in which the Governance Subcommittee checks potential components candidates for inclusion in CORE.gov".

- Cross-Agency Collaboration
  This section provides a "collaborative environment is here to promote federal inter-agency and intra-agency as well as vertical (federal, state, and local) project integration".
- Best Practices
  In order to enhance its acceptance and usability, CORE.gov also provides specific guidelines on how to design, develop, and integrate components. The aggregated experience of the CORE.gov team and its contributors is combined in a 'Best Practice' compilation to explain and facilitate the process for new users.
- Enterprise Architects
  This section comprises topics of special interest for enterprise architects
- Data Architects
  This section comprises topics of special interest for data architects

Potential Beneficiaries

- "Allow for rapid discovery and assembly of technology and service components;
- Provide access over a secure extranet where users have varying levels of access;
- Provide components that have been tested, approved and certified for reuse and enhancement;
- Enable approved users to easily find, evaluate, share and download components;
- Enable collaboration with others on component development;
- Allow users to enhance downloaded components to meet their specific needs;
- Provide a user-friendly Internet interface for searching for and finding a wide variety of business process and technical components;
- Leverage tools and saves money; and
- Provide a consolidated entry point."

Achievements

See Technical Functionalities & Approach.

Key Data

Initiative start date	March 2004
Initiative completion date	No completion planned
Budget	Not publicly available
Service in charge	U.S. General Services Administration
Action manager	Not publicly available
Contact	marion.royal@gsa.gov, yvette.gibson@gsa.gov
Countries involved	US
Public websites	http://core.gov
Initiative status	Ongoing

Documentation

See http://core.gov/index.cfm.

2.2.2. JUSTIN

Objectives

JUSTIN (Justice Information system) is an integrated justice database system for the Canadian province of British Columbia (BC). It comprises "almost every aspect of a criminal case, including: police reports to crown counsel and police scheduling, crown case assessment and approval, crown victim and witness notification, court scheduling, recording results, document production, and judicial trial scheduling".

Technical Functionalities & Approach

The major modules of JUSTIN are:

- RCC; "principal method of communicating the results of investigations between Enforcement Agencies and the Crown Counsel"
- CROWN: provides mechanisms for crown case management including document production
- COURTS: comprises functionality concerning court cases as recording court results etc.
- JUDICIARY: provides courtroom calendar and various scheduling functionalities

Potential Beneficiaries

- "Increased public safety through immediate access on the database
- Support for victims of crime legislation
- Better information quality
- Reduced costs
- Enforcement of legal rules
- Improved court scheduling
- Enhanced document production
- Protection Order Registry and Firearms Prohibition Registry
- Standard management information"

Achievements

"Launched in 1995, the core software product in version 1.02 was completed in May 1999." "Justin is now fully implemented and installed in approximately 400 office locations."

"JUSTIN is still under development to cope with new requirements in BC's justice system."

Key Data

Initiative start date	Launched in 1995
Initiative completion date	No completion planned
Budget	Not publicly available
Service in charge	Ministry of Attorney General British Columbia, Canada
Action manager	Not publicly available
Contact	http://www.ag.gov.bc.ca/contacts/ministry_email.htm
Countries involved	Canada
Public websites	www.ag.gov.bc.ca/justin/
Initiative status	Ongoing

Documentation

See http://www.ag.gov.bc.ca/justin/index.htm -> About JUSTIN.

2.2.3. SourceForge

Objectives

SourceForge is both a cooperative software development platform (SourceForge.net) and a software development system for Open Source Software.

Technical Functionalities & Approach

The functionality of the platform comprises

- Issue (feature, defect, change) tracking
- Task / Project management
- File release management
- Project communication facilities as forums, mailing lists and project news
- Wikis
- Access controls
- Development reporting to indicate project status
- Source code management
- Automated Monitoring and Notifications
- Integration with various external applications
- Open Web Services API for additional integrations

Potential Beneficiaries

- "Monitor the status of your software projects
- Manage all the stages of your development projects - regardless of where your teams are located
- Access all important project documentation and information from a central repository
- Manage software changes efficiently through through integration with Subversion and any other development tools
- Search across various software projects"

Achievements

The platform claims itself to be the market leader in its field of operations: "SourceForge.net is the world's largest Open Source software development web site, hosting more than 100,000 projects and over 1,000,000 registered users with a centralized resource for managing projects, issues, communications, and code. SourceForge.net has the largest repository of Open Source code and applications available on the Internet."

Key Data

Initiative start date	1999
Initiative completion date	No completion planned
Budget	Not publicly available
Service in charge	SourceForge, Inc.
Action manager	Not publicly available
Contact	http://web.sourceforge.com/contact.php
Countries involved	US
Public websites	sourceforge.net
Initiative status	Ongoing

Documentation

See http://alexandria.wiki.sourceforge.net/What+is+SourceForge.net%3F.

2.3.   Current Asian Activities

2.3.1. Interoperability Framework

Objectives

The Infrastructure Framework (IF) for the Government of the Hong Kong Special Administrative Region"defines a collection of specifications aimed at facilitating the interoperability of Government systems and services."

Technical Functionalities & Approach

The Registry of Data Standards, a part of the IF, offers access to standardised "data elements for reuse across bureaux / departments (B/Ds), presented as information models together with the corresponding XML schemas".

To support the definition of specifications, an XML Schema Design and Management Guide is provided.

The Common Schema management process is overseen by the XML Coordination Group. "A request for creating or changing a Common Schema has to go through a consensus making process involving all interested B/Ds before the Common Schema is registered."

Potential Beneficiaries

Strict standardisation of data formats and the fact that all new e-Government infrastructure systems, new Government to public (including businesses) systems, and new inter-Bureau and Department (B/D) systems must be developed based on the IF, ensure a high level of interoperability for the public sector.

Achievements

See Technical Functionalities & Approach.

Key Data

Initiative start date	2003
Initiative completion date	No completion planned
Budget	Not publicly available
Service in charge	Office of the Government Chief Information Officer – The Government of the Hong Kong Special Administrative Region
Action manager	Not publicly available
Contact	ifcg@ogcio.gov.hk
Countries involved	Hong Kong
Public websites	Interoperability Framework: http://www.ogcio.gov.hk/eng/infra/eif.htm Registry of Data Standards: http://www.xml.gov.hk/en/index.htm
Initiative status	Ongoing

Documentation

The HKSARG (Hong Kong Special Administrative Region) Interoperability Framework, http://www.ogcio.gov.hk/eng/infra/download/s18.pdf

2.4.   Standardisation Committees and Initiatives

2.4.1. CEN/ISSS

Objectives

The European Committee for Standardization (CEN) was founded in 1961 by the national standards bodies in the European Economic Community and EFTA countries.

"CEN's National Members are the National Standards Organizations of 30 European countries. There is only one member per country. They have voting rights in the General Assembly and Administrative Board of CEN and provide delegations to the Technical Board which defines the work programme.

It is the responsibility of the CEN National Members to implement European Standards as national standards, to distribute and sell them and to withdraw any conflicting national standards."

CEN is organised in sectors covering business, industry, and areas of public interest such as environment and security.

Technical Functionalities & Approach

"CEN coordinates efforts of its members to develop standards to be used by its members and associates. The terms and guidelines are as follows:

- Openness and Transparency: all interested stakeholders may take part in the work; representation is secured primarily through the national standards bodies which send balanced delegations to the policy-making bodies and technical committees. (Depending on specific terms of reference, the committees are also open to Associate Members, Counsellors, European trade federations and international organizations.)
- Consensus: standards are developed on the basis of voluntary agreement between all parties.National Commitment and Technical Coherence: formal adoption of European Standards is decided by a weighted majority vote of the CEN National Members and is binding on all of them. They must implement the standards at national level and withdraw conflicting standards.
- Integration with other international work: standardization is expensive and time-consuming. Wherever possible CEN works with other European bodies and international bodies in order to minimize overlaps and inefficiencies.

The standards programme is coordinated by the Technical Board of CEN.

Most standards are drawn up in technical committees and their working groups.

CEN Workshop Agreements are drawn up in Workshops."

Potential Beneficiaries

- "enhance the safety of products
- allow economies of scale
- help manufacturers comply with European legislation
- promote the interoperability of products and services
- encourage greater competition
- facilitate trade by removing trade barriers
- promote ecological safety and sustainability
- help safeguard the environment
- aid the transfer of research
- promote common understanding"

Achievements

So far, CEN has published 12903 publications (end December 2007). In addition, CEN provides a Conformity Assessment to demonstrate "that specified requirements relating to a product, process, system, person or body are fulfilled (EN ISO/IEC 17000)."

Key Data

Initiative start date	1961
Initiative completion date	No completion planned
Costs	~ 800 million €per year
Service in charge	The European Committee for Standardization (CEN)
Action manager	President: Dr Juan Carlos López Agüí (Spain)
Contact	http://www.cen.eu/cenorm/contactus.asp
Countries involved	Europe
Public websites	www.cen.eu
Initiative status	Ongoing

Documentation

See http://www.cen.eu/cenorm/aboutus/index.asp.

2.4.2. ISO

Objectives

"ISO (International Organization for Standardization) is the world's largest developer and publisher of International Standards.

ISO is a network of the national standards institutes of 157 countries, one member per country, with a Central Secretariat in Geneva, Switzerland, that coordinates the system.".

Technical Functionalities & Approach

"ISO is a non-governmental organization that forms a bridge between the public and private sectors. On the one hand, many of its member institutes are part of the governmental structure of their countries, or are mandated by their government. On the other hand, other members have their roots uniquely in the private sector, having been set up by national partnerships of industry associations.

Therefore, ISO enables a consensus to be reached on solutions that meet both the requirements of business and the broader needs of society."

"ISO standards are developed by technical committees comprising experts from the industrial, technical and business sectors which have asked for the standards, and which subsequently put them to use." The development of an international standard is a process with stages of commenting on a draft version, modifications, and balloting.

Published standards - as well as those that are under development or have been withdrawn - are managed in a catalogue of standards that provides extended search functions.

Potential Beneficiaries

As the world's largest developer and publisher of International Standards ISO is a key player concerning standardisation and ISO standards play a major role in the related sectors where standards are applied to assure interoperability.

Achievements

By the end of 2006 ISO has published 16455 standards and standards-type documents.

Key Data

Initiative start date	February 1947
Initiative completion date	No completion planned
Costs	120 million CHF per year
Service in charge	International Organisation for Standardisation
Action manager	President – Mr. Håkan Murby (2008) Sweden
Contact	http://www.iso.org/iso/support/contact_iso.htm
Countries involved	International
Public websites	www.iso.org
Initiative status	Ongoing

Documentation

See http://www.iso.org/iso/about.htm.

2.4.3. UN/CEFACT

Objectives

"The United Nations, through its Centre for Trade Facilitation and Electronic Business (UN/CEFACT), supports activities dedicated to improving the ability of business, trade and administrative organizations, from developed, developing and transitional economies, to exchange products and relevant services effectively. Its principal focus is on facilitating national and international transactions, through the simplification and harmonisation of processes, procedures and information flows, and so contribute to the growth of global commerce."

Technical Functionalities & Approach

- "Analysing and understanding the key elements of international processes, procedures and transactions and working for the elimination of constraints
- Developing methods to facilitate processes, procedures and transactions, including the relevant use of information technologies
- Promoting both the use of these methods, and associated best practices, through channels such as government, industry and service associations"

Potential Beneficiaries

As an international organisation under the umbrella of the United Nations UN/CEFACT plays an important role in facilitating trade and electronic business as the success of EDI for data exchange in trade has shown.

Achievements

Among UN/CEFACT's most prominent activities are the development of the Core Components Technical Specification (CTTS) and a library of Core Components, which is updated annually. The current version is UN/CCL version 07B issued 2008.

Other contributions of UN/CEFACT are a repository for trade documents and a repository of case studies for Single Window implementations around the world.

Key Data

Initiative start date	UN/CEFACT: 1996
Initiative completion date	No completion planned
Budget	UNECE Regular Budget; 29,810,500 $ in 2007
Service in charge	United Nations Centre for Trade Facilitation and Electronic Business
Action manager	UN/CEFACT Bureau: Mr. Mika Vepsalainen
Contact	mika.vepsalainen@unece.org
Countries involved	International
Public websites	www.unece.org/cefact/index.htm Repository site: http://unece.unog.ch/etrade/
Initiative status	Ongoing

Documentation

See http://www.unece.org/cefact/about.htm.

2.4.4. IETF

Objectives

The Internet Engineering Task Force (IETF) is an activity of The Internet Society (ISOC), a not-for-profit organization founded in 1992 to provide leadership in Internet-related standards, education, and policy.

"The mission of the IETF is to produce high quality, relevant technical and engineering documents that influence the way people design, use, and manage the Internet in such a way as to make the Internet work better." "These documents include protocol standards, best current practices, and informational documents of various kinds."

Technical Functionalities & Approach

The IETF develops and promotes RFCs (Request for Comments). The publishing of an RFC is organised in an open, transparent process. The final consensus on an RFC is achieved via mailing lists, not by final voting. RFCs may stay informal or become standards. The standardisation process itself is described in an RFC.

RFCs are managed in an RFC database that provides advanced search functionality.

Potential Beneficiaries

According to its mission the IETF supports reaching the aim of making the Internet work better.

Achievements

RFCs heavily have influenced the development of the Internet, especially by providing some of the most relevant Internet standards. Among them are the specifications of IP, TCP, FTP, HTTP, URLs, IMAP, POP3, etc.

Key Data

Initiative start date	1992
Budget	Not publicly available
Service in charge	The Internet Engineering Task Force
Action manager	IETF Executive Director

Contact	exec-director@ietf.org
Countries involved	International
Public websites	http://www.ietf.org/
Initiative completion date	No completion planned
Initiative status	Ongoing

Documentation

A Mission Statement for the IETF, http://www.ietf.org/rfc/rfc3935.txt

2.4.5. OASIS

Objectives

"OASIS (Organization for the Advancement of Structured Information Standards) is a not-for-profit consortium that drives the development, convergence and adoption of open standards for the global information society. The consortium produces standards for Web services, security and e-business, standardization efforts address the public sector as well as application-specific markets."

"OASIS was founded in 1993 under the name SGML Open as a consortium of vendors and users with the focus on developing guidelines for interoperability among products that support the Standard Generalized Markup Language (SGML). OASIS changed its name in 1998 to reflect an expanded scope of technical work, including the Extensible Markup Language (XML) and other related standards."

Technical Functionalities & Approach

The Consortium provides information portals on XML and Web services standards, Cover Pages and XML.org, and special member sections on specific themes like Open CSA.

OASIS has detailed governance policies and operating procedures. "Members themselves set the OASIS technical agenda, using a lightweight process designed to promote industry consensus and unite disparate efforts. Completed work is ratified by open ballot. Officers of both the OASIS Board of Directors and Technical Advisory Board are chosen by democratic election to serve two-year terms."

Potential Beneficiaries

With "more than 5,000 participants representing over 600 organizations and individual members in 100 countries" OASIS is one of the most important standardisation initiatives. The participation of industrial key players and the open and transpartend approval process account for a high acceptance of OASIS standards.

Achievements

The standards published by OASIS are among the most relevant and accepted ones for Web services, security and e-business.

Key Data

Initiative start date	1993
Initiative completion date	No completion planned
Budget	Not publicly available
Service in charge	Organization for the Advancement of Structured Information Standards

Action manager	OASIS Board of Directors
Contact	http://www.oasis-open.org/who/contactus.php
Countries involved	International
Public websites	www.oasis-open.org
Initiative status	Ongoing

Documentation

See http://www.oasis-open.org/who/

3. STEP 2: INSPECTION & VERIFICATION OF CANDIDATES
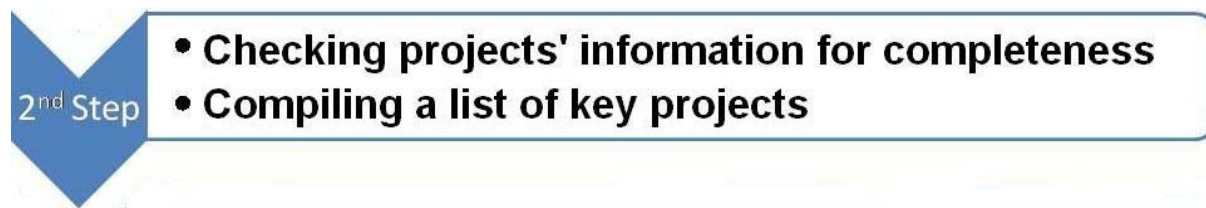
The projects and initiatives described in section two of this document are now to be checked, in order to determine whether complete and sufficient information is available to extract final results. This check-up cycle covers every of the 23 projects and initiatives presented in section two.

However, due to the fact that not all of those projects provide sufficient information for this study in terms of completeness, similarity or suitability, the prior 23 candidate projects are reduced to 11. Specific reasons why a project is considered to be of key project character are::

- the given project/initiative is of a high vitality and of international reputation
- the given project/initiative delivers detailed information about its state and solutions
- the findings of the given project/initiative are within the scope of the SEMIC.EU platform
- the given project/initiation provides innovative, interesting, and hands-on approaches to address and solve semantic interoperability problems


Figure 3-1: Illustration of Significance Determination

However in order to avoid any potential misunderstandings, the selection process is not necessarily an indicator for the quality level of a given project but more of a significance indicator for SEMIC.EU. Therefore high-quality projects of high international reputation may have been removed because the significance of their approaches and lessons learned is not within the scope of the SEMIC.EU platform.

3.1. Key Projects

After the filtering out of the projects with lesser significance in reference to the SEMIC.EU platform, a total of eleven projects remain. Those eleven projects hold the perspective of providing information of significant importance. Therefore they form the basis for further evaluation and are analysed in the upcoming steps. The specific composition of suitable projects is illustrated in table 3-1.

Initiative	Country	Launched
CORE.gov	US	04/2004

Deutschland-Online	DE	06/2006
e-GIF	UK	10/2000
ITAIDE	EU	01/2006
OIOXML	DK	03/2004
OneStopGov	EU	01/2006
ontoGov	EU	01/2004
RepXML	FR	11/2004
SemanticGov	EU	01/2006
SmartGov	EU	02/2002
SourceForge	Inc.	11/1999

Table 3-1: Key Projects

All of the projects shown in table 3-1 provide information in a sufficient quality, quantity and incorporate different and independent sources. Therefore those projects qualify for further evaluation of their specific characteristics, parameters and approaches to solve problems. In contrast to SEMIC.EU those projects have been launched or introduced to the marked already, thus holding the clear potential of providing viable information about what opportunities were taken and which problems occurred.

The majority of those projects produced so called "lessons-learned" documents, in which their specific real-world chances and threats, issues and problem solving approaches were described. This documentation is of great value, since it particularly reflects practical aspects of initiating and operating a real-world project.

The next steps evolve from rather passively inspecting the listed projects for completeness of information and suitability to produce results towards actively analysing in great detail how those projects achieved their performance and objectives.

4. STEP 3: PERFORMANCE CRITERIA & PROJECT EVALUATION

This section defines and compiles a list of performance indicators suitable to appropriately measure and evaluate a given project's success. Those performance criteria are categorised into 5 distinctive fields of interest and finally aggregated in the criteria catalogue. The criteria catalogue provides a well-arranged and easy to read overview of the evaluation means.

First the new terms used in the criteria catalogue are introduced and defined. Those include major aspects, such as the specific reason for the chosen grouping system as well as a short explanation of every categories meaning.

Then the performance indicators are explained and described in detail.

4.1. Criteria Clarification

After identifying elements of competency, for instance "good funding" or "known to people", those rather general terms needs to be further distinguished in reference to the quality level which needs to be met, how reaching the intended level may be proved and what is the field of application. The sharpening of those terms described are the criteria: "*guidelines, rules, characteristics, or dimensions that are used to judge the quality of […] performance*"[4].

The criteria composition is aligned with industry-proven and widely used standards (ISO 9126-2:2003[5] and the ISO 10746-3:1996) of performance evaluation. However, in order to address the specific expectations and requirements of the SEMIC.EU platform, additional criteria have been added. Especially the non-functional section covers most of the SEMIC.EU individual concerns, such as multilingualism and semantic integration. The following, individual criteria are appropriately categorised to improve the charts readability:

- technical aspects
- operational aspects
- non-functional aspects
- organisational aspects
- business aspects

The technical, non-functional and organisational criteria are derived from typical evaluation processes which are commonly used within the IT sector.

Since the SEMIC.EU is not designed as a research project with a limited operating time but as coordination, collaboration and exchange platform for semantic interoperability assets, business requirements and performance also need to be addressed.

4.2. Criteria Sections and Catalogue

Figure 4-1 provides a guide to the key indicators used to evaluate projects and initiatives. The evaluation was performed in five discrete areas of interest, and business factors were taken into consideration in order to identify outstanding business performance.

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[4] by North Central Regional Educational Laboratory
[5] http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=22750
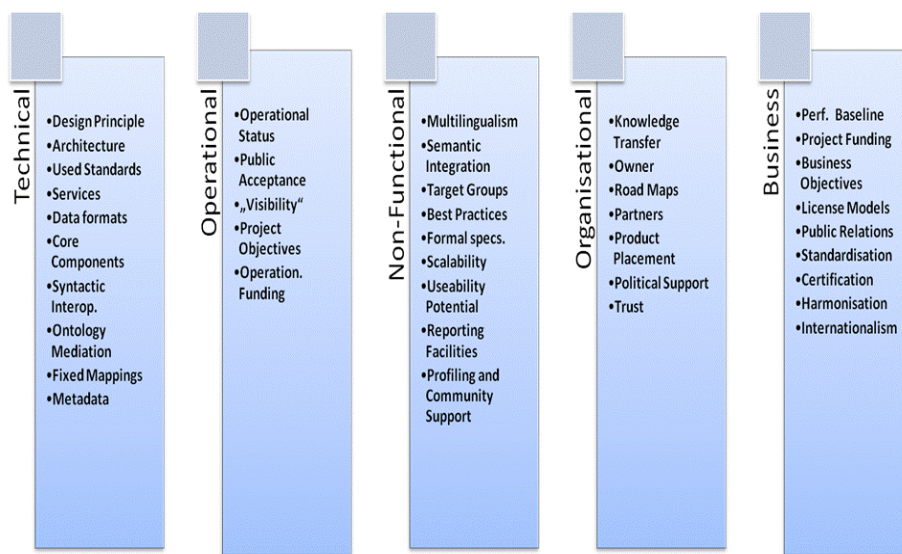
Figure 4-1: Criteria and categories

The technical column refers to specific technical aspects of a given project and includes the techniques used, compliance with technical standards, interoperability principles implemented, etc.

The operational column reflects how a given system is operated in a real-world environment and its actual performance. This does include the operational status or the issue of whether project objectives have been met.

The non-functional criteria show the non-behavioural aspects of a given system, such as semantic integration, usability, scalability, and multilingualism. Although the non-functional criteria cover a wide spectrum, the main focus of the observation is on discovering how other projects managed to reach a critical mass of users - or to investigate why they did not. Visibility is one of the main success factors and therefore it should be considered accordingly.

The organizational criteria comprise organizational factors like the composition of the project consortium and the kind of funding. Organizational criteria are collected with no specific thesis or question in mind. This approach has been used because there might be findings and similarities in the aggregated data that lead to hints about hidden success factors.

The business criteria comprise the business aspects of the initiative. As business models are a viable source of innovation and among the major key factors of success, they are of high interest with respect to the purpose of the study.

In the following sections, all indicators selected for project examination are covered in detail. For each indicator, the purpose of selection and – where applicable – a range of possible values is given.

4.2.1. Technical Indicators

▪ System design principle

Following this motivation, most of the criteria used for technical examination lead to a candidate set of possibly adoptable solutions for SEMIC.EU.

This criterion determines the fundamental system design principle and defines its intended way of operation. Systems can be complete frameworks, exclusive repositories, coordination or collaboration platforms, communication facilities, or domain-specific individual applications. This criterion does not aim at evaluation but rather seeks to cluster the projects of interest. For the in-

depth presentation of the projects examined (see appendix B), the following codes will be used to express the different design principles:

Code	Description
R	Exclusive repository
C	Coordination/collaboration facility
S	Standardization committee
G	Semantic gateway
A	Domain-specific application
F	Framework

- Architecture

The architecture of the platform / system may be a completely new development or be built upon a given framework. Additionally, this criterion indicates whether other components are integrated to fulfil the functionality of the system.

The purpose of looking at the architecture is to identify proven, existing building blocks that might also be used for SEMIC.EU.

- Standards Used

Many system properties, such as interfaces, data formats, metadata manifest, and others need to conform to agreed and widely used standards. Using agreed and well-documented standards enables a system to be properly used by its user community and transparently operated by any provider. Examples of agreed standards include HTTP, XML, and WSDL.

In addition to the use of well-known and agreed standards, tips are given concerning the rigorous use of open standards.

Each of the standards identified for this criterion is a candidate standard for the SEMIC.EU platform. Standards supported by a relevant portion of the systems observed should be supported by SEMIC.EU as well.

- Services

The criterion "Services" determines the different types of technical interfaces for data (assets) and functionality that are offered by a system. As with standards, the services investigated through the projects form a candidate set for SEMIC.EU.

- Data Formats

This criterion explores the data storage and exchange formats of a given system, like XML or text files. Especially in the field of semantic interoperability, data format specifications are of great importance in order to avoid conflicts at the data level, such as data-value conflicts or data-representation conflicts.[6]

Each of the standard identified for this criteria is a candidate standard for the SEMIC.EU platform. Standards – especially those for asset encoding and description - supported by a relevant portion of the systems observed should be supported by SEMIC.EU as well.

- Syntactic Interoperability

This criterion indicates whether syntactic interoperability is addressed by the platform, e.g. by defining strict asset types or superseded XML schemas.

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6 Mapped to technical criteria by IDABC

Examination of this criterion will lead to an overview of how other projects position themselves with respect to the degree of regulation of asset encoding.

▪ Ontology Mediation vs. Fixed Mappings

Mediation is a means of semantic integration of services that usually is based on ontologies to adapt the calling semantic to the semantic of the providing service.

Hard-coded mappings are another means of system integration, as they are the case in the "classical" EAI-style integration of legacy systems in enterprise architectures.

How to deal with concurrent assets for widely overlapping problem domains is one of the most challenging conceptual decisions that has to be made for SEMIC.EU. Looking at how others deal with this is always a good idea, especially as these projects might provide real-life examples of various approaches.

▪ Metadata

This criterion indicates the capability of a given system to properly support metadata description onto its assets to ensure certain actions. These actions include:

- o improved search capabilities
- o navigational support or guidance
- o revisable support documentation of objects
- o flexible extension of features, if required
- o automated classification

The primary focus of interest is not on how metadata is encoded or structured but rather on how it is used; that is, the kind of extended functionality based on metadata that is provided to users. Gathering innovative and accepted functionality from others and extending it with new ideas will lead to the set of desired functionality that raises the demands for the metadata setup and encoding of SEMIC.EU.

4.2.2. Operational Indicators

▪ Operational Status

This criterion illustrates the current operational state of a given project in terms of progress, operating, or not operating. This indicator does not include any specific business targets or future goals; it is used exclusively to reflect the project's current state.

▪ Project Objectives

This criterion indicates whether the initiative aims at being a production system, a pilot implementation, or a proof of concept in the context of a research project.

▪ Public Accceptance

This criterion depicts the public acceptance of the project or initiative. For this study, "public acceptance" is measured by the number of assets available how up-to-date the community-oriented pages of the project website (e. g. project news) are the number of websites containing links to the project or initiative's homepage (using link-search on Google)

Even though the result of this observation is based on somewhat subjective indicators rather than hard facts, it provides a hint as to whether a project has had networking effects or not.

▪ "Visibility"

The "visibility" of a project indicates whether it is known to a broader public. This measure says nothing about a project's success since visibility might not have been the particular project's primary objective. Nevertheless, as visibility is an objective for SEMIC.EU (and a precondition for reaching a critical mass of users), looking at this criterion helps identify highly visible initiatives for further examination.

The number of hits that Google reports for the project or initiative has been taken as the measure of its visibility[7].

4.2.3. Non-Functional Indicators

▪ Multilingualism

One core requirement and specific quality of pan-European integration is the rigorous support of multiple languages (and cultures). A multilingual system not only supports but empowers and enforces a multilingual design of its contents.

Investigations into this criterion are restricted to two issues: Would multilingualism be a unique feature of SEMIC.EU that could become a candidate for a unique selling point? If they support it, how do other initiatives deal with multilingualism?

▪ Semantic Integration

This criterion indicates whether semantic integration, e.g. the integration of Web Services in a service-oriented architecture or automated wrapper generation on semantic metadata, is addressed.

This criterion is mainly aimed at gathering good ideas and verifying existing candidates for unique selling points.

▪ Target groups

This criterion shows the intended audience or user base of a system. The following groups are explicitly distinguished: public administration (PA), industry (I), and research (R).

▪ Best Practices Documents

This point indicates the existence of specific best / good-practice documents in an initiative. These documents are an indicator for a good stakeholder involvement and training, constant reviews, and a good governance process.

For the design of SEMIC.EU, it is of definite importance to find out whether stakeholder support is a verified criterion for successful asset catalogues and – if so – what are the minimal kinds of supporting documents that should be provided?

▪ Community and Profiling Features

Using mining technology, activities of various users can be mapped onto each other in order to find clusters of users and specific navigational paths. By doing so, sophisticated community features can be implemented based on user profiles:

▫ a user can be given information about which assets have been accessed by other users with similar profiles

▫ newsletters and other informational media can be adapted to a user's special interests. This criterion is mainly aimed at gathering good ideas and verifying existing candidates for unique selling points.

4.2.4. Organisational Criteria

▪ Owner

This criterion indicates the owner of the platform, who is in charge of the operational processes, and the content of the repository. The following types of owners are explicitly distinguished: non profit organisation (NP), public administration / public agency (PA), research consortium (RC). For this study, initiatives powered by public agencies are of particular interest.

▪ Partners

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[7] It would have been even more interesting and meaningful to focus the examination of visibility on a project's intended group of users. This, however, would have been far beyond the schedule restraints and budget of this study.

This criterion describes the organisational structure of a project or initiative and the composition of the stakeholders. It may be organised as a project with a limited duration, as is usual for research projects with partners from research institutions, industry, and public administration or a continuous institution (RC Research Consortium). It may be a loosely coupled (industry) consortium (IC) or a government initiative operated within the public administration (PA).

- Operational Funding

This criterion indicates whether the initiative enjoys continuous funding, e.g. whether the costs are borne by the consortium members (NP for non-profit, as usually the funding is not aimed at achieving revenues) or financed by the public (PA public administration) as a public service.

- Project Funding

This criterion indicates the amount of external initial funding, e.g. funding by the EU on a project basis. Other funding models are a non-profit consortium (NP), public administration (PA), and private investment (PI).

4.2.5. Business Indicators

- Performance Baseline Rationale

Almost all publicly funded e-Government research and implementation projects show a *significant potential for business value* in their initial orientation papers. However, an adequate and freely available performance baseline against which the current business value and the actual benefit of any initiative can be measured and monitored is often missing.

- Business Objectives

Business objectives indicate whether the platform is operated to fulfil a public task (PT) according to an E-Government strategy, whether it is a pilot implementation as part of a research project (PI) or whether it is a business activity (BA), though not necessarily commercial, e. g. the SourceForge activities.

- License Models

The content of the repository may be subject to intellectual property rights. This criterion indicates the mechanisms provided to handle intellectual property rights, such as license models, copyright, or similar restrictions to access and use.

- Public Relations

One criterion of good practice is communication with the specific partners, related projects, and a wider audience. Results, successes, and issues should be published freely, and the visibility of a project needs to be enhanced by means of regular statements. Of additional interest is whether any specific communication or publishing sites or tools (such as SEMIC.EU) have been used.

- Standardisation

Content submitted to the repository usually has to undergo an approval process before it is published as standardised. Possible characteristics of the process are participation of stakeholders, openness and transparency, level of complexity, maturity, and quality. These characteristics have an important influence on the quality and the acceptance of the contents.

- Certification

Certification has a lower degree of necessity than standardisation, which may be reflected in a process that is less formalized than that for standardisation. Whereas standardisation usually is characterised by an (exact) definition and determination of characteristics and features, certification may apply to quality criteria only.

- Harmonisation

Harmonisation is a prerequisite to standardisation, but it may not result in standardisation but rather in policies and recommendations. If the platform addresses mediation or mappings, this is also counted as harmonisation.

- Internationalism

The constitution of the stakeholders can be focused on a national level or multinational. In this context, a project or an institution originally aimed at a national audience but which is subsequently used internationally is considered an international project or institution.

5. STEP 4: EXTRACTION OF GOOD PRACTICES OF THE KEY PROJECTS

This section extracts and presents the specific good practices by analysing the projects selected in Step 2 in detail by applying the criteria catalogue. The analysis results in three different views and representations respectively. The findings of the analysis are first presented by summarizing the crucial good practices on a per project base. Then each of the good practices identified is treated in detail. Furthermore the results of the analysis are described in tabular form in comparison and in individual project charts. There is one comparison chart for each of the criteria category defined in the preceding section (see figure 4-1).[8] Individual project charts are provided for each of the 11 projects that were selected in step 2. The charts can be found in Appendix A "Comparison Charts" and Appendix B " Individual Projects Charts".

However, those identified good practices reflect state-of-the-art technologies and approaches, which means that those are neither extraordinary innovative nor do they represent unique selling points but are commonly used within the e-Government sector. Therefore, the good practices are quite important for the SEMIC.EU platform, however, do not necessarily represent aspects which positively distinguish the platform from other good e-Government projects. The good practices are more the commonly-agreed "Do's" of the current state-of- he-art in the particular field.

5.1. Key Project Rationale

Table 5-1 briefly illustrates a composition of the project charts. By reading those charts in detail, it is easily possible to identify outstanding values, such as the extraordinary budget of ITAIDE, the massive amount of assets in SourceForge or the – in particular for e-Government projects – high visibility of the UK e-GIF. Those key values are indicators on where to search for excellence.

Table5-1: Key Project Identification

Initiative		Launched	Assets (approx)	Google Hits[9] (approx)	Page refs[10] (Google)	Page Updates
Core.gov	US	04/2004	40	3.000	32	average
Deutschland-Online / XRepository	DE	06/2006	20	2000	70	average
e-GIF	UK	10/2000	120	22.000	402	frequently
ITAIDE	EU	01/2006	n/a	3.800	8	frequently
OIOXML	DK	03/2004	600	17.200	200	frequently
OneStopGov	EU	01/2006	n/a	3.200	11	average

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[8] In order to substantiate the selection of step 2, the comparison charts are applied to all 23 projects considered in the study.

[9] This column reflects the individual number of results by the Google search engine. This provides a quick overview of the importance of a search term.

[10] The page references accumulate the individual amount of web pages that references a particular project. This roughly indicates the importance of one project for other projects or news articles.

| ontoGov | EU | 01/2004 | n/a | 1.800 | 6 | rarely |
RepXML	FR	11/2004	300	500	4	rarely
semanticGov	EU	01/2006	n/a	2.200	237	average
smartGov	EU	02/2002	n/a-	5.000	11	very rarely
SourceForge	Inc.	11/1999	168.000	46.000.000	74.100	often

The selection of the criteria in the table particularly reflects key success factors of e-Government projects. However, as a direct comparison between SourceForge and dedicated e-Gov initiatives indicates, the public visibility and asset number is significantly lower. This is due to the limited target audience involved in e-Gov projects; therefore, the scale should be adjusted accordingly.

5.2.   Key Project Evaluation

In order to illustrate and facilitate the process of identifying key success factors, outstanding projects and initiatives are analysed in-depth. The projects OneStopGov and OntoGov are not considered because in these projects the good practices don't emerge as distinctly as in the other selected projects. Specific findings are validated through evaluating certain aspects of them and applying them on a larger scale. Furthermore, a research of the literature for general key findings was performed in order to enhance their verifiability.

In the following figures the order of the indicator categories depicts their significance relative to the project considered.

5.2.1. CORE.GOV
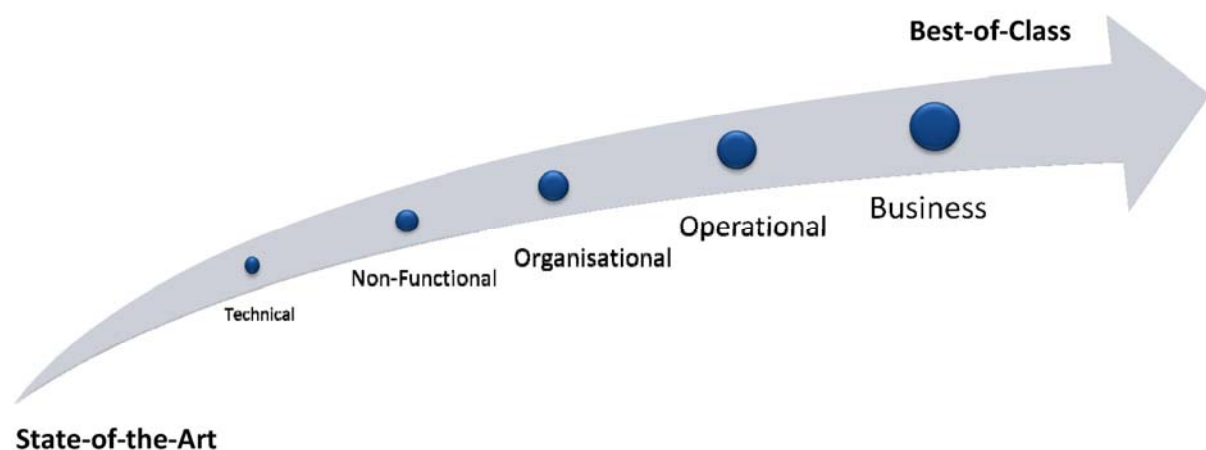
Figure 5-1: Assessment CORE.GOV

The American initiative CORE.gov (Component Organization and Registration Environment) evolved from the FEA Project Management Office is designed to provide governmental interoperability assets, public administration software, and current developments to a wider audience. Additionally, CORE offers numerous guidelines, best practices, and position papers, as well as practical examples of how to design governmental components.

CORE reflects a rather pragmatic "can-do"[11] philosophy instead of a highly formalized method of developing software. The environment focuses on achieving high-quality results as quickly as possible and removes almost all unnecessary obstacles from the development process. The extremely

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[11]R. Burk on the FEA PMO Action Plan: "If I could sum it all up in one word, it is 'Execution'. This year we must move from the drawing board and initial blueprints towards full implementation and delivering results.", 2005

practical orientation is also shown by the numerous telephone help lines, which offer assistance for public agencies in matters of development.

However, CORE.gov is an extremely business and profit-oriented initiative. Its declared primary principles are to improve the effectiveness and efficiency of the governmental IT infrastructure and therefore it needs a business-driven approach to manage all IT-systems in use. A vision and a comprehensive and competitive business model are naturally available and enforced. Noteworthy are the strict cost measurement, the constant assessment of its business benefits, and the enforcement of staying on budget, which are quite new in an e-Government environment.

CORE also establishes a clear product placement, distinguishing sharply between the public and governmental sectors. CORE is the first address to serve governmental assets that has a close partnership with another provider, http://ET.gov, whose primary target is the vendor/integrator community. In general, CORE tries to encompass all involved stakeholders and aggressively promotes the 'community idea', thus creating trust, identification, and active involvement with the platform.

Furthermore, CORE operates an extremely effective public relations office, which informs the user base about changes in a regular manner and promotes new regulations, decrees, and position papers at the top-level websites.

The potential of learning from CORE resides particularly in the clear and sharp positioning of the platform, its extraordinarily strong business orientation[12], the excellent stakeholder involvement, and the productive public relations. CORE provides comprehensive "hands-on" visions and a practical approach, with the potential to speed up development and exchange processes significantly while simultaneously cutting costs.

## 5.2.2. Deutschland-Online / XRepository
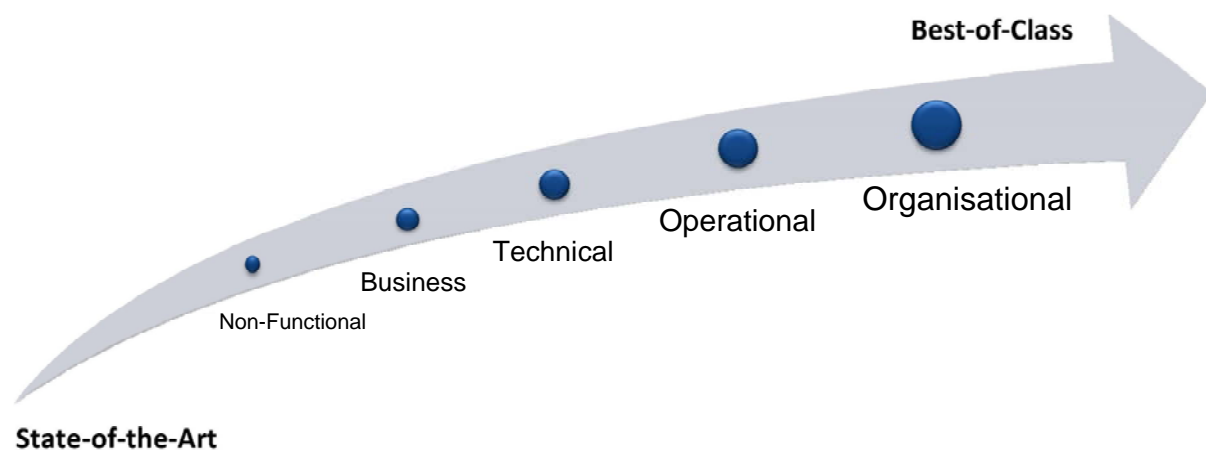
The German eGovernment initiative Deutschland-Online is since june 2006 under way to build a more effective and efficient administration throughout all federal levels of German administration. The initiative has a strong political and organisational support, which is given through the governing Deutschland Online initiative and the involved secretaries of state from the federal level as well as from the state level. The initiative is operating an office, which is placed in the Federal Ministry of the interior.

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[12] R. Burk on the FEA PMO Action Plan: "The FEA PMO will integrate the FEA with existing policy and budget practices to ensure results-oriented, market-driven investment decisions. This will be evidenced by higher service performance metrics."

The Deutschland-Online initiative gives an overview about their activities within an action plan, where standardisation is one of six major actions. In the field of standardisation the XRepository is the central platform to store interoperability assets. Even though the XRepository is not yet online, the initiative already operates the surrounding processes to harmonise Core Components, so that an operational status is achieved and the first assets have been harmonised.

The XRepository will be CCTS compliant and will use freebXML (reference implementation of the ebXML standard).

### 5.2.3. e-GIF
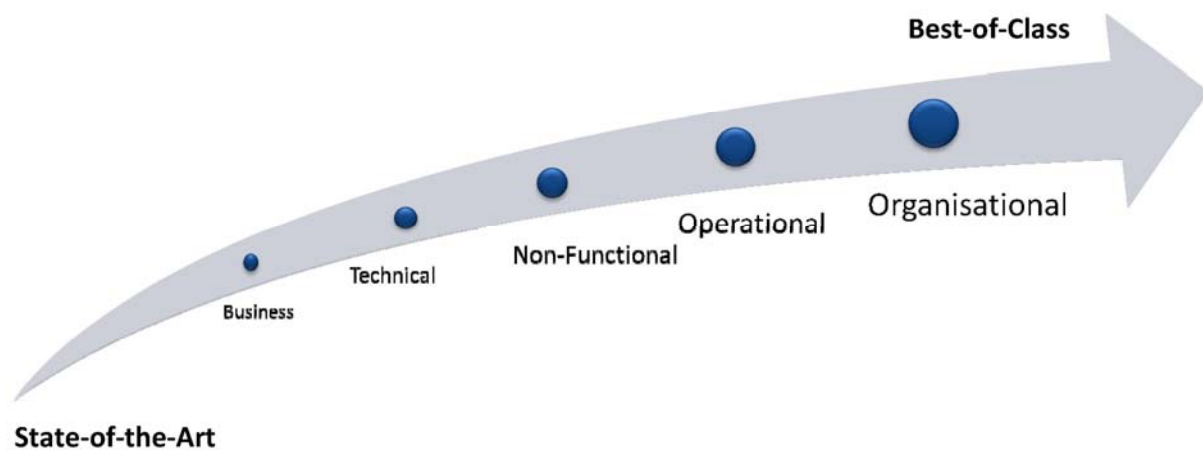
Figure 5-2: Assessment e-GIF

Among general e-Government frameworks, the UK initiative e-GIF is one of the oldest and most important worldwide. The UK e-Government Interoperability Framework was designed to enable the seamless flow of information within and towards the government by defining a set of tools, standards, and specifications. The e-GIF also provides outstanding stakeholder involvement through massive user support, guidance, and orientation papers.

The broad political support is particularly noticeable, promoting the e-GIF policies and specifications as mandatory and featuring XML standards as the core standard for data integration and management.

It is also acknowledged that e-GIF's objectives cannot be achieved "overnight" but rather that the strategy needs to be managed as a very long-term endeavour, and the framework can be changed when necessary. This illustrates the business-oriented strategy of the e-GIF steering group, whose creed is that only technical means that have been proven in the real world and generally adopted or international and open standards should be considered for the use in e-GIF in order to guarantee its business value. This approach is seen as having the greatest potential to reduce the risk and costs for any e-Government application.

The e-GIF also features the "open approach", meaning that all specifications, documentation, and strategy papers are open to the general public. The GovTalk subunit permits commenting and discussion of certain aspects, so that stakeholders may express their ideas as well.

5.2.4. ITAIDE
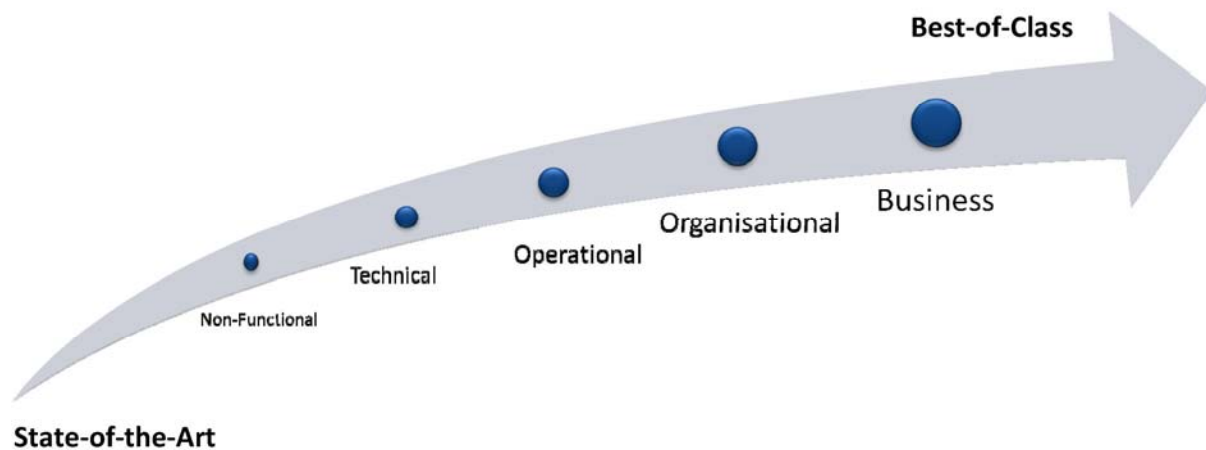
Figure 5-3: Assessmen ITAIDEt

When browsing through various European projects, one aspect of ITAIDE was found to be quite unusual: its budget. As shown in the comparison charts, the ITAIDE budget is almost twice as large as the amounts that are usually granted. Whereas various other e-Government activities suffer from inadequate funding, the ITAIDE business plan and vision papers appear to contain provisions that were capable of convincing the EU to provide extra funding. It should be noted here that this increased funding seems to have had a positive effect on the project's performance. ITAIDE also managed to form a formidable mix of partners, featuring global players such as SAP and IBM as well as universities with excellent reputations.

Apart from the great business potential of ITAIDE and its apparently excellent fund-raising abilities, strong collaboration between academic institutions and business-oriented companies was found in this project. Complex environments are simulated in almost real-world simulations called "Living Labs". This ensures not only the theoretical correctness of any results but also its business value. Other very important stakeholders are also part of the project, such as the UN/CEFACT and public administrations.

ITAIDE's strengths are clearly its adequate funding, the excellent mixture of partners from both the academic and business sectors, and its unusually good documentation and informative facilities.

5.2.5. OIOXML
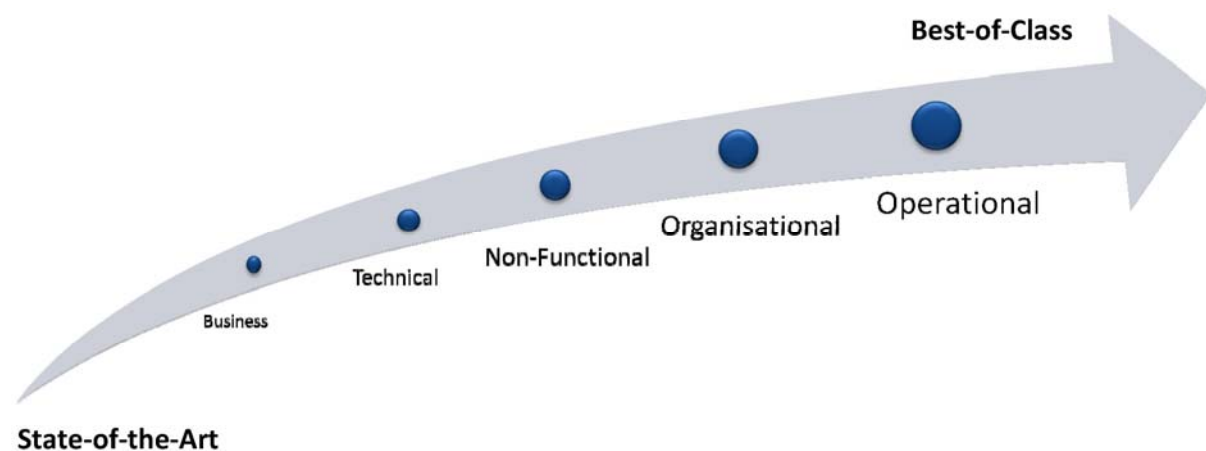

Figure 5-4: Assessment OIOXML

When subjected to a performance evaluation, OIOXML incorporates and addresses most of the vital success indicators. In particular, the political support and the initiative's visibility are truly excellent.

The visibility is guaranteed due to the prominent collection and placement of Demark's e-Gov activities on central websites, which carefully target specific audiences, e.g. http://danmark.dk for the interested citizen or http://oio.dk, which is a central web site for anyone dealing with the implementation of IT for the public sector in Denmark.

Denmark has been a pioneer in many fields because of its concrete parliamentary resolutions, such as the use of OIOXML specifications for invoicing and the strict consideration of business performance indicators when assessing governmental applications. Furthermore, Danish projects have an outstanding international reputation in managing XML standards (OIOXML committee), and it's one of the first countries in Europe to readily share its experience with others. Denmark also rigorously promotes the use of open standards: Parliamentary resolution B 103 of 2006 made the use of open standards mandatory in the public administration from January 1st, 2008.

In summary, the Danish government's strong political pressure in support of the efficient use of an e-Government approach where feasible has engendered a variety of e-Government applications that are generally regarded as being innovative, efficient, and well designed. Denmark's projects - and the experience derived from those projects - provide tangible success factors for other e-Government projects and clearly demonstrate novel, successful approaches to possible challenges.

5.2.6. RepXML
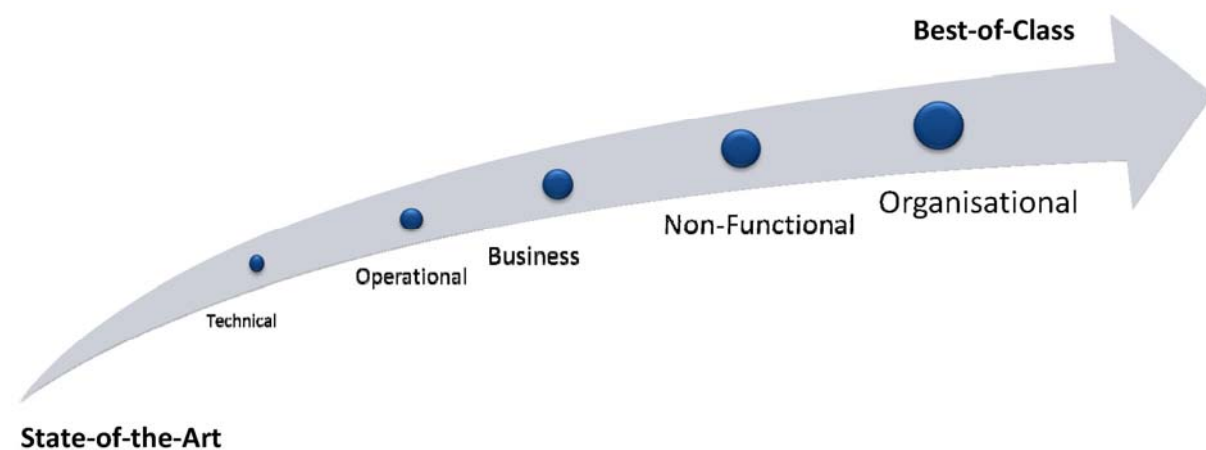
Figure 5-5: Assessment RepXML

The RepXML initiative is based on existing technologies and components, such as the ebXML registry / repository and a key registry. The RepXML application supports the storage of core components in accordance with the ebXML Registry Information Model (ebRIM). Additionally, the RepXML team works closely with the UN/CEFACT groups in order to enhance the ebXML registry / repository model.

The RepXML project (www.RepXML.org) was launched by EDIFRANCE. EDIFRANCE is a non profit organization created in 1990. EDIFRANCE gathers companies, administrations and sectorial communities promoting and developing ICT (Information Communication Technology) in French companies and administrations.

The objective of RepXML was to provide the francophone business communities with shared, reusable technology-neutral e-business components. RepXML can be used to create and validate these data (conformity to the ebXML framework - ISO 15000), or to view/retrieve already approved eBusiness data. The key features of RepXML are:

- RepXML is CCTS compliant
- RepXML uses freebXML (reference implementation of the ebXML standard)
- RepXML implements the Naming and Design Rules v1.1 UN/CEFACT specification
- download the BSs in PDF, ZIP, XMI and XSD format

- Export section from the component view includes XSD generation

RepXML is used in a field trial where user feedback is very important in order to provide a future operational service. The field trial was conducted from the beginning of 2005 and is still on-going. About 50 users from over 30 organizations are using the platform. These organizations come from the e-Government sector (French administration) and various industry sectors.

5.2.7. SmartGov

The SmartGov platform strove to facilitate the implementation of online transaction services (also referred to as e-Forms) by simplifying their development, maintenance, and integration. It primarily aims at public administration personnel and domain experts.

Although the SmartGov initiative produced quite a number of useful scientific findings and papers, its practical success had been expected to have much greater significance than turned out to be the case. Among the reasons - though not the only ones - were that the expertise and will to participate of the stakeholders involved had been overestimated[13] when the initial goals were set. Limited visibility and a lack of political pressure to introduce and use the SmartGov platform may have also contributed to its demise.

The only known remaining use of SmartGov is at the two pilot sites.

5.2.8. SemanticGov

SemanticGov is an EU-funded research project whose objective is the exploration of requirements for a pan-European interoperability framework. One key finding of the SemanticGov initiative is that technology has to be seen as an "enabler" only and that technical considerations are only a small factor in the context of interoperability: *In this paper we only dealt with technology solutions, although we acknowledge that this is only one (small) element to realise real innovation. Real improvement has to come from simplification of regulations, re-engineering of processes and a change in the culture of the civil service providers.* "[14]

The acknowledged focus is the creation of a pan-European interoperability framework and the development of regulations, processes, and back-office re-organisation for interoperability. This point is most important for SEMIC.EU, as it illustrates the fact that it is not the technology that needs to be improved but the general e-Government environment. Organisational and administrative collaboration at the pan-European level is a critical success factor nowadays and needs to be addressed as soon as possible. The technical means to achieve interoperability have been well researched and are widely available.

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[13] Evaluation of project results in SmartGov D91: "Public employees are reticent to new technologies and resistance to change may occur" and "Some public authorities may lack necessary expertise to implement the suggested solution."

[14] An Interoperability Framework for Pan-European E-Government Services (PEGS) in Proceedings of the 40th Hawaii International Conference on System Sciences, page 9, 2007

5.2.9. SourceForge
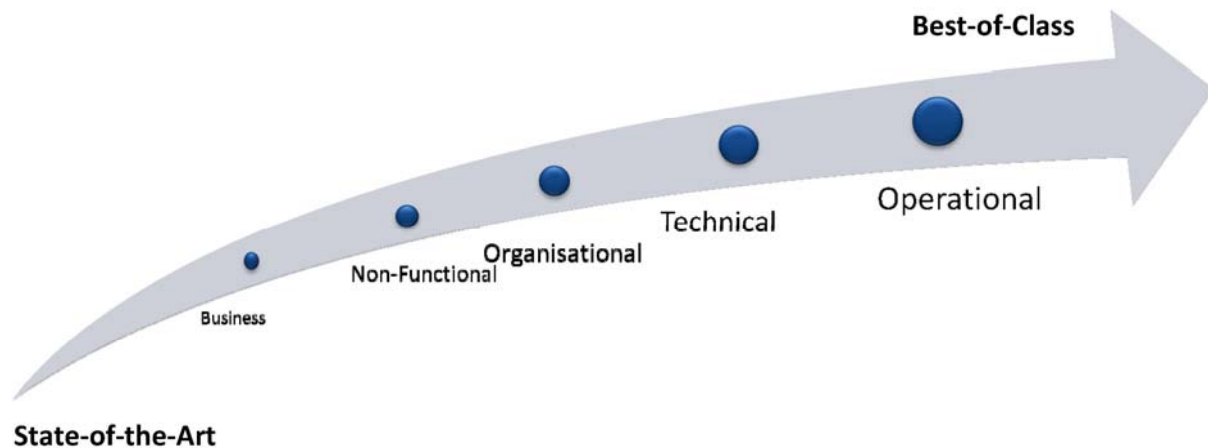
Figure 5-6: Assessment SourceForge

In contrast to all other projects presented, SourceForge is not a e-Government initiative, but rather an open repository/collaboration/revision control tool for all kinds of software.

One critical success factor of SourceForge is the sheer number of its assets. SourceForge is recognized internationally as being the first address for open source software. Additionally, SourceForge has managed to serve as the home for some of the most famous open source projects, such as "The Gimp" and "PostgreSQL". The extremely high visibility of these and other mass-appeal projects is beneficial for SourceForge's reputation and popularity, as well as the trust it generally commands. Therefore, the asset quality and the asset composition are known to be of extreme importance for the acceptance of the repository system.

Yet another success criterion is SourceForge's extremely open and free participation principle. SourceForge does not discriminate and hosts all kinds of projects; it also features a good set of collaboration and discussion tools. Those tools significantly help in bringing potential developers and asset contributors together.

Another finding was that numerous projects with initial funding but no additional operational backing have been contributed to SourceForge in order to attract potential developers and maintenance personnel, which would be not available elsewhere. This social networking also constitutes an important aspect of SourceForge's success.

5.3. Comparison Charts

For every of the eleven projects evaluated, a detailed comparison chart was compiled and interpreted in order to identify fields of excellence and outstanding performance. Those are the anchor points for extracting good practices required for the next step. In the above description of the key projects, specific hints about outstanding performance derived from the comparison charts are provided. Please see Appendix A "Comparison Charts" and Appendix B "Individual Project Charts".

5.4. Good Practices

By investigating and analyzing appropriate and interesting projects and initiatives, mainly from the e-Government area, specific key findings have been identified. Those findings have been specifically validated by applying them onto the most interesting and best performing projects and initiatives.

These are the criteria of great importance of past and present e-Government applications, and those need to be considered quite carefully in SEMIC.EU. The greater the presence of these factors, the higher the likelihood of the project's long-lasting success.

Another interesting side finding of the study is that technology does not matter to the extent it did previously. The basic tools, technical processes, and integration principles required have been well researched and are usable today; the current main issues are located in the area of back-office business process reorganization.

5.4.1. Use of Open and Accepted Standards

In the current e-Government environment, a strong trend to unify and generalize is clearly identifiable. Both the asset designer and user focus nowadays on the semantic interoperability and take syntactic interoperability for granted. Syntactic interoperability usually refers to the ability of a system to exchange information by using common protocols, interchange formats, and messaging standards. In modern computer systems, this is a pretty straightforward procedure using a set of internationally recognized and accepted standards, such as TCP/IP, HTTP, ISO 15836 (Dublin Core) and XML.

Open standards like XML and UN/CC in particular are widely adopted and used in most e-Government initiatives. The main benefits of their adoption are:

- "everyone"[15] uses XML
- availability and less dependency on individual proprietary producers
- numerous experience reports on their integration are available
- key global players (e.g. OASIS and UN/CEFACT) are advertising aggressively
- stability and robustness
- easily adjustable and upgradeable

Most operational and e-Government initiatives have published strategic and mandatory decisions about the standards to be used: *"The main thrust of the e-GIF is to adopt the Internet and World Wide Web specifications for all government systems. Throughout this section, use of the term 'system' is taken to include its interfaces. There is a strategic decision to adopt XML and XSL as the core standards for data integration and management. This includes the definition and central provision of XML schemas for use throughout the public sector. The e-GIF only adopts specifications that are well supported in the market place. It is a pragmatic strategy that aims to reduce cost and risk for government systems while aligning them to the global Internet revolution."*

In Governments and Member States, the recognition of e-Gov processes has shifted towards seeing all administrative processes as business processes/cases. As a result, business methodologies widely used in industry but which were previously unknown to the e-Gov sector are quickly being adopted and adjusted to the new field of operation.

Within this study, a number of standards were identified that which are used consistently across all major e-Government projects:

- W3C XML / XSL as primary means for data integration
- Web service interface standards of OASIS and WS-I
- Metadata based on ISO 15836 (Dublin Core)
- UN/CEFACT CCTS as means to standardize message items
- ebXML Messaging Service Standard of OASIS

In the majority of the reviewed e-Government projects and initiatives, the use of these standards is not optional but mandatory. In particular, the UK's e-GIF, Denmark's OIOXML, and Germany's Deutschland-Online - to name some key players - unambiguously specify the use of these widely used open standards.

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[15] P. Spencer on e-Government in the UK: "With two systems sending bytes […] and this is where we, like so many others, use XML.", 2004

5.4.2. Unified Services

The design principle within the e-Government area has significantly changed from offering domain-specific applications that manifested hardly any integration to the presentation of loosely coupled services within a Service-Orientated Architecture (SOA). Using the principles of SOA, all processes and interaction points are formally generalized, which means that after obtaining an interface description manually or automatically, all required data and all parameters are available in a common way. Application-specific programming, integration, and implementation are no longer necessary; the service can be used as-is, with no further adjustments.

5.4.3. Kinds of Assets

The range of asset granularity spanned by the projects examined starts with fine-grained code tables and ends with coarse-grained core components and even architectures. The following list summarizes the kinds of assets maintained by the various initiatives:

- Constant and enumeration definitions (e. g. taxonomies)
- Type definitions
- Service definitions (core components)
- Process definitions
- Architecture definitions (foreseen but not instantiated by any initiative)

With respect to the recommendation in favour of maximised openness, SEMIC.EU should provide all the kinds of assets listed above. To fill the gap between types and services, "Mechanisms" should be introduced as a sixth kind of assets. Mechanisms in the context of SEMIC.EU are mainly algorithms and problem-solving solution classes (e.g. encryption to preserve privacy).

To support semantic interoperability, further types of assets are required to map semantically overlapping assets of the various kinds:

- mapping tables for defining intersections, correspondences, and gaps between constants and enumerations
- transformation scripts and guidelines for mapping types onto each other syntactically and semantically
- wrappers for encapsulating interfaces of mechanisms and services in order to assure that they match various interface definitions
- correspondence tables for mapping processes and workflows in order to denote similarities and differences that can be handled by profiling

As the kinds of assets should correspond to a set of descriptive guidelines and encoding standards, constants should be divided into instance identifiers (e.g. OIDs), taxonomies, and ontologies. Since each asset kind is itself a type, a meta-type should be defined that describes how asset types are to be defined. By handling both the meta-type and the asset types as assets in their own right, the collaboration mechanisms of SEMIC.EU can be used for further discussion and elaboration.

Assets and its artifacts can support "packaging", which means that an asset could consist of a set of artifacts, a set of artifacts and other assets, or vice versa.

Most of the initiatives examined use asset kinds as first-level navigation. Doing that can be seen as established and accepted practice which should be adopted by SEMIC.EU.

5.4.4. Asset Pool Composition

Research has shown that a well-filled repository is more successful than a rather empty one. It is vital that SEMIC.EU does not start "empty"; the composition of the initial assets, though, is not of great importance. While there are some kinds of assets that are considered more important than others, SEMIC.EU should focus on getting as many assets as possible into its repository and not concentrate

on presenting special kinds of assets from the outset. All interoperability assets have their justification within SEMIC.EU.

However, it is advisable to demonstrate the full potential of SEMIC.EU as soon as possible, so aspects such as Multilingualism should be taken into account among the first assets. Designing assets and artifacts for pan-European use is much more complex than designing ones for national use only, so it is of great importance to show a significant number of "good examples" in SEMIC.EU. The initial assets are guideposts for other contributors, and the overall quality generally correlates with the quality of the given examples.

Furthermore, a number of specific asset kinds exist about which there is little expertise in regard to their international composition. This addresses generalized ontologies for e-Government use in particular, where good examples and guidelines on how to develop them are rare. Code lists and mapping tables are a good "bread-and-butter" way of having interoperability assets that can be used out of the box and applied to real-world systems quickly and easily.

In brief, the asset library should not just consist of one particular kind of asset but incorporate a good mixture of rather basic and widely used mappings or code lists, truly multilingual assets that can be expected to engender innovative, generalized ontologies. This mix ensures a wide interest throughout the audience and can help ensure support for SEMIC.EU.

5.4.5. Community and Discussion

When the first e-Government interoperability asset repositories were developed, no project implemented a community discussion facility. Today, only the Hong Kong Registry of Data Standards is operated without a collaboration / discussion tool. In contrast, almost all the other major repository sites (OIOXML Wiki, CORE Wiki, SAGA Forum) have added those functionalities in various ways to their portfolios over time.

The discussion boards were implemented after an understanding emerged that broad user participation and a direct link to the user base produces much better results and greatly improves public acceptance. In particular, the Danish OIOXML-Wiki and the U.S. Intergovernmental Communities[16] are well-visited boards with a wide variety of helpful articles.

5.4.6. Ease of Use

For an interoperability asset repository, it is of vital importance to provide adequate browse and search capabilities. Potential users must find assets that interest them in a quick and straightforward way. When analyzing e-Government applications and state-of-the-art industrial solutions, a clear focus on category and search capabilities was discovered.

Bigger systems usually use a rather sophisticated and flexible category system, whereas smaller ones rely on flat search models. The navigation tree of well-filled repositories is deep and implemented in great detail. For SEMIC.EU, it is advisable to start with a rather flat search model and to code the search tree in an asset directly on the platform. This adds the required flexibility to easily adjust the search function when more assets are collected.

5.4.7. Intellectual Property Rights

All interoperability assets must be marked with a clear, understandable statement of their license terms. These should be noted in an assets metadata so that a user is able to determine any issues as soon as possible. Especially in the e-Government area, simple, flat, and flexible license models are the first choice because only through their use can true interoperability be achieved and assured. The EU itself promotes very open license models.

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[16]http://www.gsa.gov/Portal/gsa/ep/channelView.do?pageTypeId=8203&channelPage=%2Fep%2Fchannel%2FgsaOvervie w.jsp&channelId=-17664

5.4.8. Barrier-free Access

With an evolving marked such as the e-Government applications and their progressing integration, the services offered need to be adjusted in order to comply with the basic accessibility regulations within the European Union and the national counterparts. Compliance with regulations becomes increasingly important over time, as more and more mandatory regulations come into force. Austria, for example, has passed a law that stipulates that all e-Government applications have to be barrier free by January 2008. Therefore, it is be advisable to comply with barrier-free codes[17] at the design level in order to obviate the need for major adjustments in the future.

5.4.9. Front-end towards Back-end Integration

The first e-Government applications were designed as barely-integrated, domain-specific applications. With further organizational and technical improvement, this design principle is hardly suited in order to achieve full integration, not only within a single department but also in organizations or agencies. The state-of-the-art approach has shifted from just linking data to the complete modelling and integration of business processes and data well beyond the various administrative levels and agencies. It is not sufficient just to bring one application "online" through a website; rather it is now required to bundle all back-office services and make all of them accessible via a unified interface. This requires the drastic reorganization of the governmental back offices and their processes and data.

It is vital to identify components that are required for the process and can be re-used in almost all government departments as well. These "core components" establish a sound basis for semantic interoperability and can serve in the modelling of the required processes. SEMIC.EU should encourage users to develop core components rather quickly in order to push the process integration forward.

5.4.10. Vitality Measures

Among the most prominent arguments for the reuse of someone else's work is "saving development costs". However, development costs are only part of the costs a reused asset causes over its lifetime ("total cost of ownership"). In particular, the efforts involved in the maintenance and constant adaptation of an asset to changing environmental conditions and requirements must be considered. From this perspective, reusing assets that do not implement established, well-supported standards is a risk, as one can never be sure whether the asset will have to be adapted repeatedly to fulfil new regulations, which is a key issue, especially in the domain of e-Government. For this reason, asset re-users have great interest in finding and selecting that are vital in terms of an active community, the existence of a long-term "care taker" for the asset, and the ability to bring one's own requirements into the asset's further development.

To support users in finding these vital assets, platforms usually provide some kind of "vitality measures" for each of their assets. A prominent example of this is the "trackers" at sourceforge.net, where one can find information about the size and the awareness of the community undertaking the further development of an open source software project.

As an asset's vitality is a crucial indicator of the forthcoming costs of its reuse, SEMIC.EU should provide this information as part of an asset's quality measures.

5.4.11. Openness

One of the most important success factors is the "openness" of the system. Contributors and interested parties should be able to participate without any unnecessary obstacles and should experience no discrimination. These success criteria have been approved by three key players among the repository operators: CORE (US), Registry of Data Standards (HK) and the OIOXML (DK), as well as included

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[17] http://www.w3.org/TR/WCAG10-CORE-TECHS/ describes techniques for authoring accessible content that apply across technologies. It is intended to help authors of Web content who wish to claim conformance to "Web Content Accessibility Guidelines 1.0" ([WCAG10] <http://www.w3.org/TR/WCAG10-CORE-TECHS/#ref-WCAG10>).

into the core policy of the UK e-GIF: *"openness – the specifications are documented and available to the public*[18] *".*

The credo of these repositories appears to be "apply pressure where required, but keep the system as open and un-bureaucratic as possible". In reality, this usually translates into systems in which government authorities are legally required to publish their interoperability assets, and business companies can discuss and download interesting assets quickly and easily at no cost.

5.4.12. Coaching

Designing and publishing interoperability assets for a wide and heterogeneous audience is quite a challenge. Other repositories, such as CORE.gov, quickly understood that there is a significant need for guidelines, how-to documents, and assistance in general.

Therefore, from the very outset, SEMIC.EU needs to provide adequate guidelines on how to collaborate and publish successfully. Additionally, it is very advisable to set up initial coaching schemes for the first contributors. The early contributors and their assets are of vital importance for the success of the platform because potential participants may evaluate the usefulness of the whole platform by the first assets published in SEMIC.EU. If he encounters an unfinished and incomplete asset collection and a significant number of unanswered help calls in the discussion boards, a potential user is likely to decide not to use the SEMIC.EU system.

In order to minimize this risk, an initial coaching process should be put in place for the first key contributors to ensure the usability of the system and to guide an effective way through the process. It is safe to assume that positive experiences and success stories will spread through the user base, greatly increasing the potential and value of the SEMIC.EU platform.

5.4.13. Active Requestor Policy

In its early stages, SEMIC.EU is highly dependent on suitable asset input. Simply providing a platform and passively wait for contributors is not recommended because, as pointed out previously, the number of interoperability assets in stock is a great success factor. It is thereby recommended to communicate actively with potential Member States and operational repositories in order to negotiate asset contributions. Furthermore, it is strongly advised to exploit all available official channels, which usually have significant political weight amongst the Member States.

5.4.14. Transparent, Tailored Processes

In the context of SEMIC.EU, every potential platform user needs to be seen as a potential contributor. Contributors help assure the platform's success, and therefore it is of crucial interest to have all users understand the most important processes of SEMIC.EU and their possible results. In particular, the processes dealing with the quality assurance of interoperability assets need to be designed in a way that they are:

- non-discriminating in regard to access
- open in participation
- comprehensible in application
- transparent in implementation
- fair and equal in execution
- foreseeable in outcome
- disputable in disaccord
- effectual in result

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[18] e-Government Interoperability Framework, Version 6.0, 30.04.2004, UK

A process design that follows these rules supports a fair and efficient process execution and minimizes the risks of a contributor's being put under pressure or treated unfairly. This may increase the motivation to contribute and to participate and thereby maximize the value of the platform.

5.4.15. Initial Content Fill

The business and community value of any collaboration platform is determined by the number and quality of its assets: content counts. An empty platform is not beneficial for most participants and therefore its acceptance and the motivation to contribute are usually reduced. In order to strategically ensure a successful placement for SEMIC.EU, it is extremely important not to start with an empty asset collection. It is advisable to use any existing contacts in order to identify an adequate number and selection of early adaptors who will help fill the platform with assets and provide their experience and success stories. In preparation of the SEMIC.EU project, a questionnaire has been communicated through official channels, and some potential contributors have already agreed to play a key contributory role[19]. When applied properly, this may result in a massive bonus for the platform and greatly boost its visibility and public acceptance.

5.4.16. Performance Baseline Rationale

Almost all funded European projects show a significant benefit or great savings potential for themselves. However, an objective and provable business performance baseline on how well a particular project is performing from a business point of view is often missing. Additionally, supporting documents for a future business roadmap or funding after the project's completion are rarely provided. SEMIC.EU must avoid these shortcomings.

SEMIC.EU incorporates the potential for savings by design, such as savings due to the fact that interested parties have no need to implement their own system, but those potential savings are highly dependent on the success of the platform. In order to justify future investments and sufficient operational funding, adequate reporting facilities need to exist to provide interested Member States with up-to-date information about the platform's current business status.

Implementing and enforcing a performance baseline is required by law in the U.S. and usually implemented in EU projects with strong industry partners. The importance of performance measurement and enforcement may be illustrated by U.S. official regulations: *"Under the Clinger-Cohen Act of 1996, agencies are required to submit business plans for IT investments to OMB that outline the steps they have taken to ensure they have adequately planned each investment to promote success. The information under review within the business cases includes acquisition strategies, security and privacy plans, and its organizational design. If the agency's investment plan contains one or more planning weakness, it is placed on OMB's Management Watch List and is targeted for follow-up action to strengthen the project's management and potential to produce results.[20]"*

5.4.17. Active Advertisement

Alongside the active participation requests, the visibility of the platform needs to be promoted as well. A desirable result is for the SEMIC.EU platform to be recognized as *THE* pan-European collaboration-and-exchange platform; it must become the first site any interested party searches first in regard to interoperability assets. This can only be achieved by active and adequate advertisement and a strong web presence with as few barriers as possible.

Furthermore, it is advisable to use common marketing means in order to reach and interest potential new users. This may be done by regular newsletters, an "asset-of-the-month" competition, and dissemination of "success stories". It is strongly advisable to form a Public Relations group that

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[19] Fahl-Spiewack]init[, Questionnaire: Germany has agreed to contribute a selection of its current national interoperability asset specifications to SEMIC.EU.

[20] U.S. Office of Management and Budget, Information Policy, http://www.whitehouse.gov/omb/egov/b-1-information.html, last visited: 02/01/2008.

bundles and focuses any advertising and communication activity. As discussed previously, insufficient visibility definitely leads to failure for the platform, and this must be avoided.

5.4.18. Support for Profiling

A common and efficient way for the reuse of existing types, mechanisms, and service specifications is profiling. Profiling denotes the interpretation and application of a given specification for a certain purpose by defining conventions of use. In contrast to versioning or specialisation, profiled assets still comply with the normative definitions of the "parent" asset.

Even many existing standards such as X.509 certificate encodings, SAML assertion encoding, and XACML subject and rights definitions must be profiled in order to be usable in practice.

Profiling is a mechanism to implement a given asset for a more specific abstraction layer. For example, by means of profiling, a standard such as SAML can be made usable for a certain domain or even a business process.

It can be assumed that many of the assets of SEMIC.EU will also have to be profiled before they can be reused within other activities than their original projects. None of the initiatives examined provides special support for profiling or denotes asset relationships from which one can easily find profiles of a given asset.

Profiling is strongly demanded by users, but it is not generally being supported by other projects. This appears to make it an excellent candidate to become one of the unique selling points best suited to attract users to SEMIC. Potential ways of supporting profiling could include:

- providing guidelines on how assets of certain kinds should be set up and encoded in order to support profiling
- producing guidelines for certain assets on how to profile them
- recognising profiling aspects as part of an assets metadata that enables users to find existing profiles of a given asset easily
- making tools available to support profiling of certain assets. These tools could be used for guided, interactive implementation of selected assets for certain purposes. As a result, users would get an adapted specification (e.g. XML schema) bundled with documentation. Profiles generated this way are assets in their own right and could automatically be registered at SEMIC.EU.

Profiling support could be a "killer feature" for SEMIC.EU. It is therefore recommended to implement minimum support from the outset (e.g. guidelines and examples). Further features and functionalities (e.g. tools) should be conceptually elaborated in parallel in order to incorporate them into the next release of SEMIC.EU in 2009.

5.4.19. Domain Models

While profiling (see above) provides guidelines on how a single asset can be adapted for a domain or a business process, domain models provide guidance on how various assets can interoperate within a domain.

A prominent example for a domain model is the HL7 CDA Reference Information Model (RIM), which defines the semantic types to which assets can be assigned. By following the combination and interaction rules of the RIM, one can easily see how different assets can work together to implement a certain task.

The major benefit of a domain model (where domains can even be fine-grained business areas) is that it allows a semantic assortment of assets. Interoperability is incorporated by design, as each asset designer must define the semantic type to which an asset belongs and the rules that must be followed to implement it. Other users can then take these semantically annotated assets and set up business processes in accordance with the rules of the domain model.

SEMIC.EU should support domain models as asset types, even though the HL7 CDA RIM is currently the only elaborated instance of this asset type. Further research should be done throughout 2008 to define a concept for ways assets can be linked to domain models and how domain models can provide further benefit for users (e. g. by introducing semantic search capabilities or by automatically generating semantic linkages between assets).

6. RECOMMENDATIONS

The good practices identified in the preceding step, reflect state-of-the-art technologies and approaches. Almost every successful project within the e-Government sector applies these good practices. This means that these practices are neither innovative nor do they represent unique selling points. The SEMIC.EU platform however should feature potential unique selling points which need to be exploited in order to unfold the full potential of the SEMIC.EU vision and opportunities.

5th Step • Deriving specific recommendations for SEMIC.EU

6.1. Strong Political Backing

In particular, adequate political support is one of the most important success criteria for any e-Government project. In general, projects with strong political backing (or even political pressure) perform significantly better than those without it. Positive real-world examples are Germany's Deutschland-Online, the e-GIF-Framework in the UK, BRITE and IT-AIDE as EU projects, and the Danish project OIOXML. In Denmark, the political intention to strengthen the position of OIOXML was manifested in the declaration that all invoices sent to government agencies[21] had to be generated in compliance with the OIOXML specifications.

> Adequate political support and backing is one of the most important success criteria for any e-Government project

6.2. Positioning

Although SEMIC.EU is certainly not the only repository platform within the European Union, it might greatly benefit from its unique state. Created within IDABC as the Commission's coordination head, accompanied by the CEN/ISSS eGov Focus Group as the coordination / standardization head, and working in federation with the national various repository projects, SEMIC.EU can put itself into a extremely promising position: the single point of exchange for all the above.

In particular, the potentially close coalition between the eGov Focus Group and SEMIC.EU enables the joint initiative to gain a level of political support that neither would able to garner as an individual project. The trusted assets of the platform, the intended pan-European collaboration space, and the platforms significant contributor participation help create a possible audience for the e-Gov Focus Group that could determine the need for further coordination or direct standardisation of the SEMIC.EU platform.

To put it succinctly, it is highly likely that SEMIC.EU will produce exactly the kind of input and trends required by the focus group in order to identify possible standardization candidates. As an additional benefit, SEMIC.EU's "branded" assets do conform to an extremely high-quality baseline, which might also contribute to the acceleration of the standardisation process.

> Therefore, the SEMIC.EU platform should be positioned between the CEN/ISSS eGov Focus Group on one side and the national repositories on the other side.

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[21] Statute on information in the OIOXML Electronic Invoice for use with invoicing of public sector organisations, November 11, 2004.

The national repositories are usually filled with monolingual assets of national concern that are mainly geared for distribution within a national scope.

However, many of these assets are interesting for other parties as well, such as other Member States or local or foreign businesses. Additionally, there are increasing numbers of regulations that require interoperability assets to be published in a pan-European format, which is a great challenge to the individual national repository operators and smaller interested parties. SEMIC.EU can assist here by creating a single point of exchange for contributors and other stakeholders. This will lessen the burden on all sides and possesses massive potential for engendering beneficial synergy effects.

The IDABC committee has a key role in achieving all of the above. IDABC's level of support correlates directly with the predicted success of SEMIC.EU. SEMIC.EU has almost no power on its own to create strong political support (or pressure); it can only achieve this by convincing the national repositories to make massive contributions of assets. Additionally, SEMIC.EU requires commitment from the Member States in order to be considered as the platform-of-choice by the majority of contributors.

6.3.   Networking and Anchors

As also described elsewhere in this study, the formation of strategic networks with SEMIC.EU at their centre is imperative for the platform's success. The timing of SEMIC.EU is quite good, as a lot of European countries either have started their own semantic interoperability initiatives or are about to do so. In both cases, Member States are interested in exchange and collaboration on a pan-European level. This current momentum and the arising opportunities should be beneficial.

Strategic partnerships with key contributors and potential political bodies should be embraced sooner rather than later in order to provide the potential user base a set of fully-integrated services.

This may mean exchanging interoperability assets with national repositories, working all the way through the SEMIC.EU processes, and passing on the results to standardization bodies such as the CEN/ISSS e-Gov Focus Group. The added value for the user, apart from potentially significant time and money savings, is to have the perspective that his asset traverses the European processes in a well-defined, well-guided, and rather foreseeable way.

This may prove greatly beneficial to the user, as he is merely using the SEMIC.EU platform as a single-point-of-contact and is not required to contact and negotiate with a huge number of regulatory or standardization bodies on his own. SEMIC.EU can serve as an anchor point for contributors by providing the necessary domain processes, contacts, and workspaces. Fully integrated life cycles such as the one described are available in certain national projects like GovTalk in the UK and OIOXML in Denmark, but they are not yet offered at a European level. SEMIC.EU might be able to fill the gap by rigorously creating networking effects and strategic alliances with other key players within the e-Government environment.

The advantage for any standardization body is that consolidated input is received which fulfils a certain level of quality, and, – which is almost more importantly – considered to be an interesting asset by the user community. Therefore, SEMIC.EU not only assures a quality level but is able to identify interesting assets as well.

6.4.   Funding

"Being an example of good practice can have its costs!" [22]
Hardly a repository exists that finances itself completely. Due to the nature and purpose of the assets, it is almost impossible to force users to pay to participate. However, properly used, positioned, and applied, the SEMIC.EU platform is readily able to cut costs for all participating Member States.

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[22] Quote taken from: "Back Office Reorganization Vol. 3", ROS Ireland Analysis, DTI & IIB, 2004

Therefore, it is of the greatest importance to ensure constant funding as well as sufficient coaching and support services in order to position SEMIC.EU as a reliable, independent, and trustworthy source for e-Government interoperability assets within the European Union. The failure to provide adequate funding will result in an immediate loss of trust and reliability; it might also be interpreted as a lack of political support. This could accumulate to provoke a total failure of SEMIC.EU. It is therefore imperative to identify potential sources of financing in advance and to operate an effective fund-raising program that ensures the operational capacity to fulfil the intended objectives.

Inadequate funding - some efforts are actually launched with no funding plan for constant operation whatsoever! - is one of the most critical life-or-death aspects of e-Government projects. Usually, funding concentrates exclusively on the short term or a precisely defined run time of a given project. The identification of long-term benefits and costs grows rather short, and therefore the overall calculations and financial implications are often inadequate.

A project positioned like SEMIC.EU may turn out clearly beneficial in a business and collaboration point of view; however it requires constant funding in order to keep the platform in operation.

A business-performance rationale that indicates significant cost-savings and estimates the asset value of the platform is definitely required in order to justify long-term funding. An outstanding example of an adequate business-performance rationale is given by IT-AIDE, where the long-term aspects of the funding are properly addressed.

6.5.   Trust

A major point that definitely needs to be addressed in SEMIC.EU is trust. On the one hand, potential asset contributors need to be convinced that their investment (the actual asset that is uploaded and published in SEMIC.EU) is safe, well treated, and beneficial. Potential asset users, on the other hand, need to be convinced that their using an asset is legal and proper and that there are no additional unforeseeable strings or terms attached. SEMIC.EU needs to advertise its quality assurance process aggressively in order to create a sufficient level of trust within its user base. Branded assets need to be actively recommended by official EU bodies to send out a clear signal: those assets are good, free to use, and beneficial for the public.

Although SEMIC.EU is an IDABC project and may involve a large number of official key players, the project and platform itself do not possess major political power.

By implementing open, free, and transparent processes; expert groups; and community balloting, paths are laid that create mutual trust between the user base and the platform operators.

Users need to be sure that they can legally use, discuss, and exchange interoperability assets in a well-defined way within SEMIC.EU. Vital information, such as license agreements, legal information, or use restrictions need to be communicated adequately and correctly.

6.6.   Visibility

Another point of significant importance is a project's visibility.

Highly visible projects tend to perform much better and are also able to benefit greatly from their visibility; hence visibility has a self-energising effect.

The importance of the visibility factor has been recognized by all involved parties to an extent where nationwide publicity campaigns have been established for e-Government applications. The costs and size of the target audiences of those campaigns were formerly unknown to the e-Gov sector. One of the most noticeable publicity campaigns of this type ever run was the one by the UK's Inland Revenue as part of the Government Gateway.

6.7.   First dedicated Pan-European Collaboration Platform

To date, SEMIC.EU is the only dedicated pan-European collaboration platform for interoperability assets, which may be greatly beneficial for its successful launch and future operation.

SEMIC.EU needs to fill the empty spaces at the European level as quickly as possible in order to position and consolidate itself as the leading collaboration and exchange point for Quality Assured Content.

Almost all national repositories implement a quality baseline rationale in order to have consolidated assets at their disposal. These assets usually fulfil any regional requirements and regulations but are of limited usability within a pan-European context. Therefore, a more flexible quality baseline that adequately reflects pan-European interoperability needs in general is required, which also provides specific quality aspects. This new quality baseline is implemented as one of the core processes of the SEMIC.EU platform.

Conformity with this baseline, however, is completely voluntarily. When asset owners needs more time to adjust their asset pool, no discrimination of assets can be enforced in any way. When the asset owner sees fit to have his assets (or a selection of his assets) quality checked, he simply moves those asset candidates into the conformance process. After successfully passing through the steps, those interoperability assets are termed "branded assets", which means the asset quality is assured by an expert group.

Branded assets are a clear quality indicator for the contributor and greatly increase *interest* and *trust* of other parties in those assets.

7. CONCLUSION

Semantic interoperability is one of the most important topics in the pan-European communication between the public administrations. A definite requirement for further harmonisation of the IT applications is already identified and overcoming the current limitations is put onto the agenda of most e-Government integration initiatives.

Therefore the timing for establishing the pan-European coordination, collaboration and exchange platform for semantic interoperability assets in the e-Government sector is excellent and certainly holds the potential to reach its objectives. However, in order to perform the SEMIC.EU launch and its ongoing operation as smooth as possible, a number of key recommendations should be considered most carefully when operating the platform.

One of the most important aspects is the adequate political support and backing of the platform. The success of SEMIC.EU is greatly dependent on the number of member states actively participating and the amount of useful assets in the repository. This means, that a number of key players needs to be convinced, that the SEMIC.EU platform is the right place to publish their assets. The platform itself may only advertise itself but has no other means in order to force participation. Therefore other parties, such as the IDABC committee, with more political power and a broader audience should be convinced to state an official commitment for SEMIC.EU as *THE* platform for semantic interoperability assets. IDABC's level of support correlates directly with the predicted success of SEMIC.EU. All other opportunities of creating more political backing and networking need to be exploited to its full extent as well. This specifically includes a close coalition to the CEN/ISSS eGov Focus Group and an obligatory tight binding with the existing national repositories holding interoperability assets. This intended tight coalition leads to a specific and well-desired positioning as a mediator and communication agent between the national repositories and the high-level working groups, such those from CEN.

However in order to be a coalition candidate, the SEMIC.EU platform needs to be advertised and made know to its audience. It is most likely insufficient to passively advertise the platform by the traditional means of newsletter or web pages, but needs to be advertised aggressively and actively. High visibility leads to more potential platform participants, which again potentially leads to more assets causing more users to accept the platform. Once this cycle has been established, SEMIC may well be considered as THE pan-European platform, therefore reached its objective.

In order to achieve a wide acceptance and a certain trust in the platform by all involved parties, the platform needs to provide adequate means in order to assure for the confidence which has been placed in SEMIC.EU. This particularly addresses the issue of adequate funding. The potential assets of the participants represent a certain value, therefore:

- asset owners want their assets to be visible, safe and valued
- asset developers need a stable, supportive platform to collaborate
- asset users want a stable, robust and easy to use platform with many assets
- national repositories may use the SEMIC.EU to overcome a potential national lock-in
- Member States want positive synergy effects and a return on investment
- anchors, such as the e-Gov Focus Group may utilise the platform as a source for ideas & trends
- the IDABC committee wants to support the delivery of cross-border public sector services

Those different targets may only be achieved by proper and adequate operational funding. However, financial backers usually exclusively invest, when a return on their investment somehow is foreseeable. Therefore the funding directly correlates with the trust of the participants in the platform and – again – with the appropriate political backing of SEMIC.EU.

This clearly highlights, that the unique selling points are not to be seen independent from each other but directly correlate to each other in a way, that one unique selling point is actually amplifying

another. For instance, political backing and adequate funding leads to increasing trust. A highly trusted platform causes more asset providers to upload and publish interoperability assets. A platform with a massive amount of interoperability assets attracts significantly more users. Having more developers and users on the other hand creates more political backing, because the platform seems to be widely accepted and of good reputation. This may be formulated as a *circle of success (see figure 6-1)*, which holds the unique opportunity of being *self-energised*.
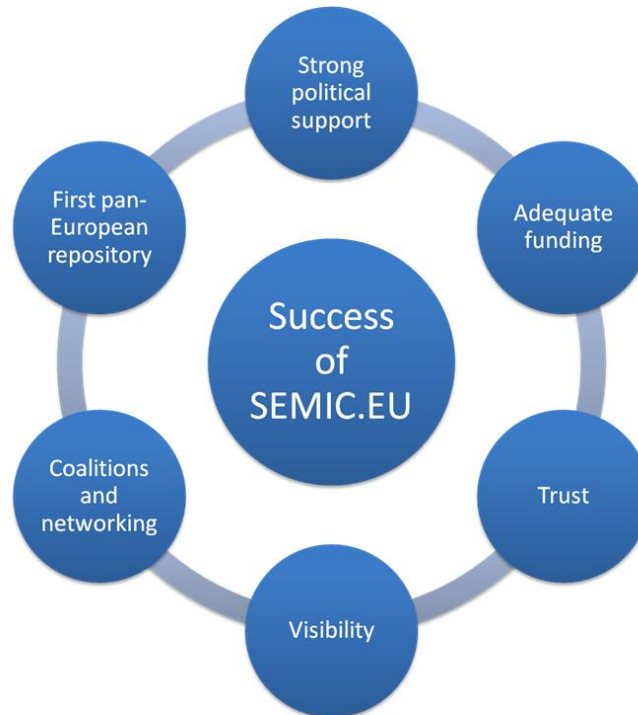

Figure 6-1: cyclic self-energising success process

It is strongly advisable that SEMIC.EU fully exploits this fact by intentionally energizing those positive catalysts in order to create a *cyclic self-energising success process*.

A.   COMPARISON CHARTS

The examination of the key projects is structured along a list of viable criteria (see section 3 "Viable Criteria Identification and Selection") in order to achieve the objectives of:

- Identifying good practices by looking at what existing projects are doing
- Identifying candidates for unique selling points by looking at what existing projects are not doing
- Investigating key success factors by looking at how existing project do what they do

A.1.   Technical Indicators

	Priciples						Used Standards			Services	Mappings	Metadata Ontology Mediation	
	- Framework	- Repository	- Service Directory	- Standardisation	- Semantic Gateway	Application	- Data Storage Formats	- Data Exchange Formats	- Core Components			Metadata	Ontology Mediation
ACCESS-eGov			X		X	~		WSDL		SWS	X	X	X
ARTEMIS			X	X				HMD		~	X	X	X
BRITE				X	X	X	XML	XML		HTTP	X	X	X
CEN/ISSS eGov Focus		~	X	X	X						X	X	X
CORE.gov	~	X		X	X			XML	X	SWS	X		
Deutschland-Online „XRepository"	X	X		X	X		XML	XML	X	HTTP	X		X
e-GIF	X	X	X	X	X		XML	XML	XML	HTTP	X	X	X
IETF		X		X	X								
Infrastructure Framework		X		X			XML	ebXML	X				X
ISO				X	X								
ITAIDE				X	X	X	XML	ebXML	X	SWS	X	X	~
JUSTIN		X		X	~	X	SQL	XML		SWS	~		X
OASIS		X		X	X								
OIOXML		X		~	X		XML	XML	X				X
OntoGov			~		X			WSDL		SWS	X	X	
OneStopGov					X	X		WSMO		SWS	X	~	
RepXML		X		~				ebMS	X	HTTP			X
RIDE				X	X		XML	HLCDA			X	X	X
SAKE	X	X		X			DAISY	XML		HTTP	X	X	X
SemanticGov		X	X	X	X	~	ORDI	WSMX		SWS	X	X	
SmartGov			X		X	~	XML	XML		HTTP	X	X	X
SourceForge		X		X									X

UN/CEFACT		X	X		X	X					XML	ebXML	X			X	X	

X   supported, existing or fulfilled

~   partly supported, existing or fulfilled

Empty   not supported, existing or fulfilled

A.2.   Operational Indicators

		Operational Status	Public Acceptance	"Visibility"	Project Objectives
ACCESS-eGov		IP	X	~	POC
ARTEMIS		NO	~	~	POC
BRITE		IP	X	~	PS
CEN/ISSS eGov Focus		OP	X	X	PS
CORE.gov		OP	X	X	PS
Deutschland-Online / XRepository		IP	X	X	PS
e-Gif		OP	X	X	PS
IETF		OP	X	X	PS
Infrastructure Framework		OP	X	X	PS
ISO		OP	X	X	PS
ITAIDE		IP	X	X	POC
JUSTIN		OP	X	~	PS
OASIS		OP	X	X	PS
OIOXML		OP	X	X	PS
OneStopGov		OP	~	~	POC
OntoGov		OP	~	~	POC
RIDE		NA	~	~	POC
RepXML		IP	X	~	PS
SAKE		IP	~	~	POC
SemanticGov		IP	~	~	POC
SmartGov		NO	~	~	POC
SourceForge		OP	X	X	PS
UN/CEFACT		OP	X	X	PS

X   supported, existing or fulfilled

~   partly supported, existing or fulfilled

Empty   not supported, existing or fulfilled

IP   In Progress

NA   Not Applicable

NO   Not Operational

OP   Operational

POC   Proof of Concept

PS   Production System

A.3. Non-Functional Indicators

	Multilingualism	Semantic Integration	Target Groups	Best Practices	Scalability	Usability Potential	Reporting Facilities
ACCESS-eGov	X	X	PA, I, R	X	~	~	
ARTEMIS		X	PA, I, R		X	X	
BRITE	X	X	PA, I, R		X	X	
CEN/ISSS eGov Focus			PA, I		X	X	
CORE.gov		X	PA, I	X	X	X	X
Deutschland-Online / XRepository		X	PA	X	X	X	X
e-Gif		X	PA	X	X	X	
IETF			PA, I		X	X	
Infrastructure Framework		X	PA	X	X	X	
ISO	X		PA, I		X	X	
ITAIDE		X	PA	X	X	X	X
JUSTIN		X	PA, I		X	X	
OASIS			PA, I		X	X	
OIOXML		X	PA	X	X	X	
OneStopGov		X	PA, I, R	X	~	~	
OntoGov		X	PA, I, R		~	~	
RepXML		X	I		~	X	
RIDE		X	PA, I, R	X	~	X	
SAKE		X	PA, I, R		~	~	
SemanticGov	X	X	PA, I, R		~	~	
SmartGov	X	X	PA, I, R	X	~	~	
SourceForge		~	OPEN		X	X	
UN/CEFACT			PA, I		X	X	

X   supported, existing or fulfilled

~   partly supported, existing or fulfilled

Empty   not supported, existing or fulfilled

I   Industry

PA   Public Administration

R   Research

A.4.   Organisational Criteria

	Knowledge Transfer	Owner	Road Maps	Internationalism	Partners	Standardisation	Certification	Harmonisation
ACCESS-eGov	X	RC	X	X	RC			X
ARTEMIS	X	RC		X	RC			X
BRITE	X	RC	X	X	RC			X
CEN/ISSS eGov Focus		PA		X	PA	X		
CORE.gov	X	PA	X	X	PA		X	
Deutschland-Online / XRepository	X	PA	X		PA	X	X	X
e-Gif	X	PA	X	X	PA	X		
IETF		NP		X	NP	X		
Infrastructure Framework	X	PA	X	X	PA	X		
ISO		PA		X	PA	X		
ITAIDE	X	RC	X	X	RC	X		X
JUSTIN		PA	X		PA			X
OASIS		NP		X	NP	X		
OIOXML	X	PA	X	X	PA	X		
OneStopGov	X	RC		X	RC			X
OntoGov	X	RC		X	RC			X
RepXML		NP	X		NP	X		
RIDE	X	RC		X	RC			X
SAKE	X	RC		X	RC			X
SemanticGov	X	RC		X	RC			X
SmartGov	X	RC		X	RC			X
SourceForge	X	NP	X	X	NP			
UN/CEFACT		PA		X	PA	X		

X   supported, existing or fulfilled

~   partly supported, existing or fulfilled

Empty   not supported, existing or fulfilled

NP   Non Profit

PA   Public Administration

RC   Research Consortium

A.5. Business Indicators

	Performance Baseline	Operational Funding	Project Funding (in Euro)	Business Objectives	License Modells	Public Relation
ACCESS-eGov			1,98 Mio	PI		~
ARTEMIS			1,99 Mio	PI		~
BRITE	X		6,3 Mio	PI		~
CEN/ISSS eGov Focus		PA	PA	PT	X	X
CORE.gov	X	PA	PA	PT	X	X
Deutschland-Online /XRepository		PA	PA	PT		X
e-Gif		PA	PA	PT	X	X
IETF		NP	NP	NP	X	X
Infrastructure Framework		PA	PA	PT	X	X
ISO		PA	PA	PT	X	X
ITAIDE	X		5,8 Mio	PT		X
JUSTIN		PA	PA	PI		~
OASIS		NP	NP	NP	X	X
OIOXML		PA	PA	PT	X	X
OneStopGov			2,1 Mio	PI		~
OntoGov			1,71 Mio	PI		~
RepXML		NP	NP	BA	X	
RIDE			1,16 Mio	PI		~
SAKE			1,84 Mio	PI		~
SemanticGov			2,72 Mio	PI		X
SmartGov			1,95 Mio	PI		X
SourceForge		NP	NP	BA	X	X
UN/CEFACT		PA	PA	PT	X	X

X   supported, existing or fulfilled

~   partly supported, existing or fulfilled

Empty   not supported, existing or fulfilled

BA   Business Activity

NP   Non Profit

PA   Public Administration

PI   Pilot Implementation

PT   Public Task

B.   INDIVIDUAL PROJECT CHARTS

B.1.   CORE.gov

Technical	Design Principle	Coordination/collaboration facility
	Architecture	Collaboration platform
	Used Standards	There is no restriction to standards, since in the scope of CORE.gov are components of various type and complexity. XML Schema.
	Services	No
	Asset/Data Formats	No restriction
	Core Components	Yes
	Syntactic Interoperability	Not explicitly
	Ontology Mediation	No
	Fixed Mappings	No
	Metadata	Yes: author, short description, key words, resource type, etc.
Operational.	Operational Status	In production
	Public Acceptance	- few cross-references - latest entry to news section about 2 years old
	"Visibility"	- 3.000 page hits on google (low)
	Project Objectives	Production system
Functional	Multilingualism	No
	Semantic Integration	Via XML Schema
	Best Practices	Yes
	Community/Profiling	No
Org.	Owner	Several American public agencies
	Operational Funding	No. Operated by public agency.
	Project Funding	Funded by public administration
Business	Target Groups	Open
	Business Objectives	No, operation of repository is considered as public task
	License Models	No
	Internationalism	Used internationally though not aimed at.
	Standardisation	Partly.
	Certification	Approval process for components.

| | Harmonisation | Cross-agency collaboration shall be facilitated by common models, policies, procedures and protocols. |
| | Public Relations | No / advertised/enforced internally only |

B.2.   Deutschland Online / XRepository

Technical	Design Principle	Coordination/collaboration facility
	Architecture	Collaboration platform in development, based on the Open Source Software freebXML Registry
	Used Standards	CCTS, XML, XMI
	Services	Repository services not yet available
	Asset/Data Formats	no technical restrictions
	Core Components	Yes
	Syntactic Interoperability	Via XML Schema, a tool for automatic generation of XML Schema und documentation (XGenerator) is provided
	Ontology Mediation	No
	Fixed Mappings	Yes
	Metadata	Yes
Operational.	Operational Status	In development
	Public Acceptance	Yes
	"Visibility"	Yes, as subproject of Deutschland-Online
	Project Objectives	Production system
Functional	Multilingualism	No
	Semantic Integration	Via XML Schema
	Best Practices	Yes
	Community/Profiling	No
Org.	Owner	German Government
	Operational Funding	Yes. System will be operated by public agency.
	Project Funding	Funded by public administration
Business	Target Groups	German administration
	Business Objectives	No, operation of repository is considered as public task
	License Models	No
	Internationalism	Can be used internationally, results will be publically made available.
	Standardisation	Yes

	Certification	Approval process for components.
	Harmonisation	Cross-agency collaboration shall be facilitated by common models, policies, procedures and protocols.
	Public Relations	Advertised through Deutschland Online initiative

B.3.   e-Gif Registry

Technical	Design Principle	Exclusive Repository
	Architecture	Web application
	Used Standards	XML Schema, UML, Metadata Standards
	Services	No / by e-GIF governmental framework
	Asset/Data Formats	zip, pdf
	Core Components	Yes
	Syntactic Interoperability	Via XML Schema
	Ontology Mediation	No
	Fixed Mappings	No
	Metadata	Yes
Operat.	Operational Status	In production
	Public Acceptance	- 100 cross-links - news section rather current
	"Visibility"	- 22.000 hits on google (high)
	Project Objectives	Production system
Functional	Multilingualism	Yes
	Semantic Integration	Via XML Schema
	Best Practices	Yes
	Community/Profiling	No / partly by govtalk
Org.	Owner	British Cabinet Office, Content owned by different organisations, e.g. British Standards Institute, Delivery and Transformation Group
	Operational Funding	No. Operated by public agency.
	Project Funding	Funded by public administration
Business	Target Groups	Public administration projects
	Business Objectives	No, operation of repository is considered as public task

	License Models	Copyright regulations
	Internationalism	Yes
	Standardisation	Yes
	Certification	Yes
	Harmonisation	No.
	Public Relations	Partly

B.4.   ITAIDE

Technical	Design Principle	Domain-specific Application (eCustoms)
	Architecture	Service oriented approach based on IBM and SAP products
	Used Standards	XML Schema
	Services	Web Services
	Asset/Data Formats	Not addressed
	Core Components	Yes
	Syntactic Interoperability	extremely domain specific
	Ontology Mediation	Partly
	Fixed Mappings	Yes
	Metadata	Yes
Operat.	Operational Status	In progress
	Public Acceptance	- few cross-references - periodically issued news on the home page
	"Visibility"	- 3.800 page hits on google (medium)
	Project Objectives	Production system
Functional	Multilingualism	Yes
	Semantic Integration	By data transformation
	Best Practices	Yes
	Community/Profiling	No
Org.	Owner	International Research Consortium with partners from research, industry and public administration
	Operational Funding	Perspective by Customs authorities
	Project Funding	5,8 Mio Euro EU funding
Business	Target Groups	eCustoms projects

	Business Objectives	4 pilot implementations
	License Models	No
	Internationalism	Yes
	Standardisation	Yes, standardisation of eForms, core components
	Certification	No
	Harmonisation	By mediation.
	Public Relations	News section

B.5.   OIOXML

Technical	Design Principle	Framework
	Architecture	Repository with additional Web Services
	Used Standards	UDDI, WSDL, CCTS. XML Schema, UML
	Services	WebDav and Web Services with and without authentication
	Asset/Data Formats	See Used Standards
	Core Components	Yes
	Syntactic Interoperability	Via XML Schema, WSDL
	Ontology Mediation	No
	Fixed Mappings	No
	Metadata	Yes: author, short description in Danish and English, object term, label, taxonomy, key words
Operational.	Operational Status	In production
	Public Acceptance	- 600 assets - 200 references to OIOXML - Public administration enforces use of OIOXML
	"Visibility"	17.200 page hits on Google (high)
	Project Objectives	Production system
Functional	Multilingualism	Danish and most parts also in English
	Semantic Integration	Via XML Schema
	Best Practices	Yes
	Community/Profiling	No
O Org.g.	Owner	Danish XML Committee
	Operational Funding	Operated by public agency.

	Project Funding	Funded by public administration
Business	Target Groups	Projects in the public administration, industry partners.
	Business Objectives	No, operation of repository is considered as public task
	License Models	Copyright regulations
	Internationalism	Partly. Aimed at Danish public administration and stakeholders, but repository is in English, English documentation.
	Standardisation	Yes. Mature standardization process.
	Certification	No
	Harmonisation	Yes, but only as prerequisite to standardisation
	Public Relations	News section, last news from 2006

B.6.   OneStopGov

Technical	Design Principle	Framework
	Architecture	Portal including life-event ontology, life-event reference models, a live-event workflow execution module and integration middleware
	Used Standards	OWL DL
	Services	Web Services and Semantic Web Services
	Asset/Data Formats	Not addressed
	Core Components	No
	Syntactic Interoperability	Not explicitly
	Ontology Mediation	Yes
	Fixed Mappings	Yes
	Metadata	No
Operat.	Operational Status	Pilots operational
	Public Acceptance	- 11 cross-references - latest entry to news page about 4 years old
	"Visibility"	3.200 page hits on google (medium)
	Project Objectives	Proof of concept
Functional	Multilingualism	Yes
	Semantic Integration	Ontology based
	Best Practices	No
	Community/Profiling	No

Org.	Owner	International research consortium with partners from research, industry and public administration
	Operational Funding	No
	Project Funding	2.115.000 €EU Funding
Business	Target Groups	Public administration projects
	Business Objectives	4 pilot implementations
	License Models	No
	Internationalism	Yes
	Standardisation	No
	Certification	No
	Harmonisation	No
	Public Relations	News section, last news from 2008

B.7. OntoGov

Technical	Design Principle	Framework
	Architecture	Broker-architecture enhanced by meta ontologies, domain-oriented ontologies and administration ontologies
	Used Standards	SOAP, WSDL, OWL-S, WSMO
	Services	Semantic Web Services
	Asset/Data Formats	Not adressed
	Core Components	No
	Syntactic Interoperability	Not explicitly
	Ontology Mediation	Yes
	Fixed Mappings	No
	Metadata	No
Operat.	Operational Status	Not operational
	Public Acceptance	- 6 cross-references - last updated: January 2006
	"Visibility"	1.800 page hits on google (medium)
	Project Objectives	Proof of concept
Functional	Multilingualism	Yes
	Semantic Integration	Ontology based
	Best Practices	No

	Community/Profiling	No
Org.	Owner	International research consortium with partners from research, industry and public administration
	Operational Funding	No
	Project Funding	1.710.000 €EU Funding
Business	Target Groups	Public administration projects
	Business Objectives	3 pilot implementations
	License Models	No
	Internationalism	Yes
	Standardisation	No
	Certification	No
	Harmonisation	By ontology based .mappings
	Public Relations	News section, last update 2006.

B.8. RepXML

Technical	Design Principle	Exclusive Repository
	Architecture	Based on the Open Source Software freebXML Registry 3.1 (lastest version).
	Used Standards	CCTS, XML, XMI
	Services	Editor Component for editing and submitting ABIEs (Aggregated Business Information Entities), XML Schema export
	Asset/Data Formats	ABIEs
	Core Components	Yes
	Syntactic Interoperability	Via XML Schema
	Ontology Mediation	No
	Fixed Mappings	No
	Metadata	Organizational metadata as name, company, status. Keywords.
Operational	Operational Status	Field trial
	Public Acceptance	- 600 assets (approved and candidates) - nearly no references to the project home page - most current news entry by August 2005
	"Visibility"	500 page hits on google (low)
	Project Objectives	Is planned as a production system for the future
Functional	Multilingualism	No
	Semantic Integration	Via XML Schema

	Best Practices	No
	Community/Profiling	No
Org.	Owner	Edifrance
	Operational Funding	NP
	Project Funding	NP
Business	Target Groups	Industry
	Business Objectives	BA
	License Models	No
	Internationalism	No
	Standardisation	Yes
	Certification	No
	Harmonisation	No
	Public Relations	News section, date of last news is 08/2005

B.9.   SemanticGOV

Technical	Design Principle	Semantic Gateway
	Architecture	Service oriented architecture with mediator functionality to integrate semantic web services.
	Used Standards	WSDL, WSML, WSMO, WSMX.
	Services	Semantic Web Services
	Asset/Data Formats	Not addressed
	Core Components	No
	Syntactic Interoperability	Not explicitly
	Ontology Mediation	Yes
	Fixed Mappings	No
	Metadata	No
Operational	Operational Status	In progress
	Public Acceptance	237 pages linking to project homepage
	"Visibility"	2.200 page hits on Google (low)
	Project Objectives	Proof of concept
Functional	Multilingualism	Yes
	Semantic Integration	Addressed by mediation

	Best Practices	No
	Community/Profiling	No
Org.	Owner	International research consortium with partners from research, industry and public administration
	Operational Funding	No
	Project Funding	2,72 Mio Euro EU funding
Business	Target Groups	Public administration projects
	Business Objectives	Pilot implementation
	License Models	No
	Internationalism	Yes
	Standardisation	No
	Certification	No
	Harmonisation	By mediation.
	Public Relations	News section, many entries.

B.10. SmartGOV

	Design Principle	Framework
Technical	Architecture	Based on DreamWeaver. Repository with additional functionality for developing e-form-based services, agent-based integration functionality
	Used Standards	XML
	Services	No
	Asset/Data Formats	Not addressed
	Core Components	No
	Syntactic Interoperability	Not explicitly
	Ontology Mediation	No
	Fixed Mappings	Yes
	Metadata	No
Operat.	Operational Status	Not operational
	Public Acceptance	- 11 cross-references - latest entry to news page about 4 years old
	"Visibility"	5.000 page hits on google (medium)
	Project Objectives	Proof of concept

Functional	Multilingualism	Yes
	Semantic Integration	Addressed by gateway
	Best Practices	No
	Community/Profiling	No
Org.	Owner	International research consortium with partners from research, industry and public administration
	Operational Funding	No
	Project Funding	1,95 Mio Euro EU funding
Business	Target Groups	Public administration projects
	Business Objectives	2 pilot implementations
	License Models	No
	Internationalism	Yes
	Standardisation	No
	Certification	No
	Harmonisation	By mediation.
	Public Relations	News section, last update 2004.

B.11. SourceForge

Technical	Design Principle	Framework
	Architecture	Portal, integration of collaboration and version management tools as CVS, Subversion etc.
	Used Standards	Not applicable
	Services	No
	Asset/Data Formats	Not applicable
	Core Components	No
	Syntactic Interoperability	No
	Ontology Mediation	No
	Fixed Mappings	No
	Metadata	Name, project registration, latest file release
Operational	Operational Status	In production
	Public Acceptance	- 168.00 running development projects - 18 million visitors per month - 74.100 cross references

	"Visibility"	46 million page hits on google (very high)
	Project Objectives	Production system
Functional	Multilingualism	No
	Semantic Integration	Not applicable
	Best Practices	No
	Community/Profiling	No
Org.	Owner	SourceForge, Inc
	Operational Funding	By owner
	Project Funding	By owner, revenues through ads
Business	Target Groups	Not restricted
	Business Objectives	BA
	License Models	Open Source Model for all projects
	Internationalism	Aimed at international use
	Standardisation	No
	Certification	No
	Harmonisation	No
	Public Relations	Newsletter, RSS, comprehensive community activities.