This paper was prepared for the IDABC Programme by:
Authors’ names: Alain Michard (AM2 Systems), Antoine Rizk (Sopra)
Sopra
19-21 rue du Colonel Pierre Avia
75015 Paris
FRANCE

Contract No. IDA. 20040733, Framework contract ENTR/02/21-MIDDLEWARE-XML,
Specific contract N°9

Disclaimer

The views expressed in this document are purely those of the writer and may not, in any circumstances, be interpreted as stating an official position of the European Commission.

The European Commission does not guarantee the accuracy of the information included in this study, nor does it accept any responsibility for any use thereof.

Reference herein to any specific products, specifications, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favouring by the European Commission.

All care has been taken by the author to ensure that s/he has obtained, where necessary, permission to use any parts of manuscripts including illustrations, maps, and graphs, on which intellectual property rights already exist from the titular holder(s) of such rights or from her/his or their legal representative.

This paper can be downloaded from the IDABC website:
http://europa.eu.int/idabc

© European Communities, 2005

Reproduction is authorised, except for commercial purposes, provided the source is acknowledged.
## Modification history

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Author</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>23/09/2005</td>
<td>0.3</td>
<td>A. Michard</td>
<td>Current draft</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A. Rizk</td>
<td></td>
</tr>
<tr>
<td>11/10/2005</td>
<td>0.4</td>
<td>A. Michard</td>
<td>New Clearinghouse Project Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A. Rizk</td>
<td></td>
</tr>
<tr>
<td>11/10/2005</td>
<td>0.5</td>
<td>A. Michard</td>
<td>Following comments from IDABC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A. Rizk</td>
<td></td>
</tr>
<tr>
<td>26/12/2005</td>
<td>0.6</td>
<td>A. Michard</td>
<td>Following comments from IDABC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A. Rizk</td>
<td></td>
</tr>
<tr>
<td>31/01/2006</td>
<td>0.8</td>
<td>A. Michard</td>
<td>Following comments from IDABC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A. Rizk</td>
<td>Annex A: development budget</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P. Verstichel</td>
<td></td>
</tr>
</tbody>
</table>
# Table of Contents

1 Introduction .......................................................................................................................... 7  
1.1 Background ....................................................................................................................... 7  
1.2 Objectives of the European XML-Clearinghouse .......................................................... 8  
1.3 Tasks .................................................................................................................................. 9  
1.4 Governance ....................................................................................................................... 10  
1.4.1 Sponsoring / Managing Organisation ................................................................ 11  
1.4.2 Steering Committee ........................................................................................... 12  
1.4.3 Technical Advisory Network ............................................................................... 12  

2 Published Content ............................................................................................................. 14  
2.1 Candidate Assets ........................................................................................................... 14  
2.2 Terms of Use .................................................................................................................... 15  
2.3 Asset Documentation ...................................................................................................... 15  
2.4 Structure of Interoperability Assets .............................................................................. 15  
2.5 Guidelines and Reports ................................................................................................. 17  
2.6 Local vs. Central Storage ............................................................................................... 18  

3 Functionality and Architecture ......................................................................................... 19  
3.1 Functionalities of the Clearinghouse Service ............................................................... 19  
3.1.1 Extensions of the Registry Information Model ....................................................... 19  
3.1.2 Asset Publishing ....................................................................................................... 19  
3.1.3 Asset Versioning ....................................................................................................... 20  
3.1.4 Asset Storage ............................................................................................................ 20  
3.1.5 Asset Retrieval ......................................................................................................... 21  
3.1.6 Collection Browsing ................................................................................................. 21  
3.1.7 Browsing a Classification Scheme ....................................................................... 21  

1.5 Asset Storage .................................................................................................................... 20
3.1.8 Asset Documentation Management ......................................................... 21
3.1.9 Workflow Monitoring .............................................................................. 21
3.1.10 Semantic Gateway/Validator ................................................................. 22
3.1.11 User Management ................................................................................... 22
3.1.12 Publish Miscellaneous Documents .......................................................... 22
3.1.13 Generic Web-centric Communication Functionality ................................. 22
3.2 Architecture of the Clearinghouse Service .................................................... 23
3.3 Mapping the Clearinghouse Data-model onto the ebXML Standard .................. 24

4 Organisation and Processes ............................................................................. 27

4.1 Actors ............................................................................................................. 27
4.1.1 Direct Contributor ....................................................................................... 27
4.1.2 Indirect Contributor .................................................................................... 27
4.1.3 Clearing Manager ....................................................................................... 27
4.1.4 Steering Committee .................................................................................... 28
4.1.5 Technical Advisory Network ...................................................................... 28
4.1.6 Server administrator and Webmaster ........................................................... 29
4.1.7 Registered User ........................................................................................... 29
4.1.8 Sponsoring Organisation ........................................................................... 29
4.2 Publishing Process Overview .......................................................................... 29
4.3 Responsibilities and Rights in the Clearing Process ......................................... 30
4.4 IPR .................................................................................................................. 32
4.5 Quality Policy .................................................................................................. 33
4.6 Conflict Resolution ........................................................................................ 34

5 Success Factors ............................................................................................... 35

5.1 Political Commitment of the European Commission ....................................... 35
5.2 Synergy with National and Regional Agencies ............................................... 36
5.3 Permanent Collaboration with EU Entities ..................................................... 37
5.4 Close Follow-up of PCI and PEGS Requirements ................................................. 38
5.5 Choice and Action Capacity of Clearing Manager .................................................. 39
5.6 Technical and Organisational Credibility .............................................................. 40

6 Project Planning and Resources .............................................................................. 41
  6.1 Rationale and Objectives of a Clearinghouse Development Project ...................... 41
  6.2 Work Packages for the Development Project ....................................................... 41
    6.2.1 Set up of the Governance Mechanisms .......................................................... 42
    6.2.2 Development of Guidelines and IPR .............................................................. 43
    6.2.3 Development, Editing and Publishing of Content .......................................... 43
    6.2.4 Development, Management and Hosting of the Technical Platform .............. 44
    6.2.5 Communication and Motivation ................................................................... 51
    6.2.6 Project Management ..................................................................................... 51

7 Conclusions .............................................................................................................. 52

8 Bibliography ............................................................................................................. 53
1 Introduction

1.1 Background

It is a central mission of the IDABC Programme to provide a European Interoperability Framework that facilitates the implementation of pan-European eGovernment Services (PEGS)\(^1\). Along with organizational and technical aspects, semantic interoperability is defined as being the key factor to achieving full interoperability by this framework.

In this context, semantic interoperability is generally concerned with ensuring that the precise meaning of exchanged information is understandable by other parties. Since there are many parties – sectors, Member State administrations at all levels, citizens and businesses – interacting, this complex and difficult objective requires a properly defined strategy in order to apply it to pan-European projects.

As a first step IDABC has already defined a strategy and identified actions and measures to be taken, in order to favour semantic interoperability and content interoperability in general\(^2\). The IDABC Working Paper on Semantic Interoperability recommends setting up a European Interoperability Clearinghouse (=XML Clearinghouse), organising the publication of Interoperability Assets at the European level, as central instrument for the implementation of the semantic interoperability strategy. In this context, a Clearinghouse is defined as a pan-European online information and collaboration platform.

This online information service and collaboration platform may have one or several access points, and may be distributed over several information servers. It is at first a technical facility, which supports a clearing process leading to the publication of Interoperability Assets supporting semantic interoperability.

This clearing process is a publishing procedure, through which the Interoperability Assets are created or identified and collected, transformed (versioning), documented, quality-checked, classified and made available to a user constituency. This implies that the Clearinghouse also has a very important organisational aspect – as any publication activity has. Sponsors and stakeholders have to agree on governance rules, to decide what can be published, when, in which form, by whom. That means that also responsible actors – technical or organisational – and their roles have to be defined.

---

\(^1\) Published in November 2004, the European Interoperability Framework for pan-European eGovernment services outlines the principles of this framework: [http://europa.eu.int/idabc/en/document/2319/556](http://europa.eu.int/idabc/en/document/2319/556). Together with the present paper and other documents it is to constitute the IDABC Interoperability Guidelines.

Last but not least, there is a promotional aspect, as the Clearinghouse will have to actively convince its stakeholders that it delivers added-value in return their efforts and investments. This entails continuous networking activities with users and contributors in sectors and Member States, and in particular with other sectoral or national Clearinghouses.

The nature and the role of the so-called Interoperability Assets (IA) have been described in the Working Paper on Semantic Interoperability Strategy, and are recalled in section 2.1 of this paper. They mainly include the category of Syntactic Assets (SynA) such as XML schemas, core components and Semantic Assets (SemA) such as terminologies, categories etc. Both are to be found in the XML-Clearinghouse together with guidelines, methodologies and general information on projects.

The objective of this study is to assess the feasibility of a European Clearinghouse for Semantic Interoperability Assets. It examines the setting up and implementation of the XML Clearinghouse from both technical and organisational perspectives. It also proposes a raw project plan and gives cost estimations.

1.2 Objectives of the European XML-Clearinghouse


Several Member States have already come to the same conclusion for the national level. They have deployed online services providing information on their interoperability policy, and access to various Interoperability Assets. A European XML-Clearinghouse should not compete with these services, but offer an obvious added value by complementing these national services and setting up partnerships.

Taking into account these preconditions, the European Clearinghouse will have to focus on the following objectives:

- Provide for seamless data exchange: Promote and support the use and reuse of Interoperability Assets in the context of pan-European eGovernment Services (PEGS), IDABC’s Projects of Common Interest (PCI), and similar projects.

- Tackle the challenge of multilingualism: Encourage the production and pursue the promotion of trans-European multilingual assets, which are produced by the sector and which can be used to enable data exchange within future PEGS and PCIs.
Create Pan-European synergies: Identify widely existing national assets that may be exploited (after some possible adaptation) for European usage. Encourage and support the translation of such assets.

Support pan-European collaboration: Provide support for cross-border collaboration on Interoperability Assets for sectors and Member States.

1.3 Tasks

In pursuing its objectives, the Clearinghouse has to take up a number of different tasks:

- The Clearinghouse serves as a central information and exchange platform for XML-related projects in the context of European Institutions.

  It will publish Interoperability Assets, which are used, modified or created at the European level. This entails publicizing existing or forthcoming assets produced by European organisations (e.g.: EU Parliament, EU Patent Office, EUROSTAT, EURODACAUTOM, various directorates of the Commission) that might be valuable – or even requested – to deploy PEGS and PCIs. The very first role of the Clearinghouse is to facilitate a publishing process through which such assets are identified, documented, quality-checked, and distributed to potential users.

  The IDABC Working Paper on Semantic Interoperability has already identified a number of Interoperability Assets produced by various EC directorates, EU entities or national agencies that would prove valuable to public bodies or to private companies for setting-up pan-European information systems. They only have to be easier to find and to access.

- The Clearinghouse will offer functionalities for the search and retrieval of these semantic assets (registry and repository).

- The Clearinghouse will publicize and link to comparable institutions providing Interoperability Assets at the national level or in specific sectors.

- The Clearinghouse will technically and organisationally support the production of new Interoperability Assets in the sectors, which are required by PCI- and PEGS-related projects. This applies in particular for assets in support of multilingualism.

  However, the Clearinghouse is not supposed to develop Interoperability Assets as an own initiative.

- The Clearinghouse will in particular promote the creation of specific Interoperability Assets by reusing modules or fragments of existing assets. In other words, one
objective of the Clearinghouse is to demonstrate a modularity mechanism enabling building new assets from existing fragments that may themselves evolve through independent versioning processes. It will actively collect reusable elements.

- The Clearinghouse will establish/publish methodologies, disseminate best-practices, return on experience regarding standards and tools that may help national agencies and companies – as well as their counterparts at the European level – in their efforts for creating, validating and updating Interoperability Assets.

- The Clearinghouse will provide collaborative tools and methods that sectoral communities, who develop assets (potentially in collaboration with Member States), can use. Those tools should be as open as possible, using latest collaborative web applications and tools.

- The Clearinghouse will actively network among the XML-communities in public administration, organizing meetings, workshops, seminars, online consultancy etc. and providing means for information exchange. It will thus motivate stakeholders to become users and even more important: contributors who publish their assets via the Clearinghouse.

In addition:

- If requested by the stakeholders, the Clearinghouse may provide facilities to check and validate the content-transcoding mechanisms that may be needed to exchange content between local (national, regional) information systems while preserving the meaning and the accuracy of the content that is exchanged. Concretely, the Clearinghouse service should enable a user to submit a data-sample to the entry-point of a transcoding pipeline and obtain the resulting (transcoded) data-sample, compatible with some target local system. To provide this functionality, the Clearinghouse must implement the semantic gateway functionality as described in the IDABC eGovernment Infrastructure Study\(^3\).

### 1.4 Governance

Since the Clearinghouse is to provide guidance specifications to Member States and Sectors, its governance has to be underpinned by transparent and open processes. This is needed to induce credibility among the users and to motivate stakeholders to contribute.

---

\(^3\) Technical description of target eGov infrastructure for delivering PEGS. Architecture for delivering pan-European eGovernment services Version 1.0 - IDA / CapGemini, Dec. 2004
At least in its starting phase the Clearinghouse is likely to be organised as a Commission project with a manager and staff to do the operational work, which will be provided by an external contractor.

The Clearinghouse governance should be based on three entities, which will provide 1) the sponsoring and supervision of the project, 2) the strategic steering of its activities, and 3) the provision of technological expertise. Member States and sectors will have their stake in all three entities.

1.4.1 Sponsoring / Managing Organisation

This is the organisation, which funds the direct expenses of the Clearinghouse service, nominates its manager, and supervises the management of the project.

The IDABC Unit of the European Commission has already supported a number of projects aiming either at developing new Interoperability Assets, or at developing PCIs and PEGs that exploited such assets and this policy will continue in the future⁴. Setting-up and supporting the Clearinghouse is perfectly consistent with this policy and with the general objectives of IDABC. Moreover, IDABC has the managerial capacity to be a credible sponsor for the pan-European Interoperability Clearinghouse. However, it should be noted that setting-up and supporting a European Clearinghouse must be considered as a permanent policy and cannot be managed as a limited-duration project.

A central organisation such as IDABC is considered more apt to commit to persistency and sustainability than a virtual network of stakeholders, since the Clearinghouse implies permanent and reliable operational activities as well as coordination tasks. However, IDABC as it stands today cannot fully cater for this operational model. Adequate measures must therefore be taken in order to ensure that IDABC has the required long-term persistency and the financial means to act as a supporting and supervising organisation. The IDABC work programme includes for 2006 a “Study into the financing and management options for cross-border eGovernment”⁵. This is the adequate action to deliver answers concerning the sustainability of the Clearinghouse.

As a result, the operational processes of the Clearinghouse may lead to administrative and managerial practices that may differ substantially from the past and current practices of IDABC. As IDABC operates today, it will have to discuss and approve the strategic

---

⁴ IDABC tenders the services for its projects according to European procurement law.

orientations with Member States delegates, via its PEGSCO and the related Technical Working Group.

Although it will still take some time to clarify the long-term perspective of the Clearinghouse sustainability, it is recommended to start the project as soon as possible:

1) There are a perceivable lack of guidance and a need for orientation in the fast moving area of XML-related Interoperability Assets. Early coordination efforts will save later mapping and transformation activities between the many partners of European eGovernment – or at least reduce them.

2) The experience gained in the development phase will enter in the concept of the final solution.

1.4.2 **Steering Committee**

This is the committee responsible for defining the general strategy, which the Clearinghouse should apply in order to optimise its contribution to content interoperability in Europe. The Steering Committee advises the *Sponsoring Organisation* and recommends further actions. It notably advises the sponsor on the relevance and the priority of possible projects aiming at developing new Interoperability Assets. It ensures that the supported projects and initiatives are aware of the relevant activities carried-out in the Member States at national or regional level, and that everything is done to maximize synergy between European-level actions and local ones.

The Steering Committee should be composed of representatives from Member States and sectors, who are able to contribute the interests of their stakeholders. A chair may be elected by the Committee members for an annual mandate. Alternatively, the Steering Committee may be chaired by the representative of the Sponsoring Organisation.

The Steering Committee should hold face-to-face meetings at least twice a year.

1.4.3 **Technical Advisory Network**

The Technical Advisory Network is a European network of experts (consultants, researchers, documentation specialists, staff of contributing organisations etc.), who will validate the technical and publishing performance of the Clearinghouse. Member States and sectors may nominate experts for different areas. For each task in which technical expertise is needed (e.g.: Validate possible assets, Check Submitted assets, Check new versions) a few experts
from this network (two or three) are selected to check the Clearinghouse activities and products for quality.

The Advisory Network will also be responsible to outline and approve Clearinghouse policy papers and guidelines.

Technical members may be invited to participate and bring their expertise to the working sessions of the Steering Committee.
2 Published Content

The XML-Clearinghouse will provide a wide range of general information, international news, technical documents, links etc. like any other thematic website. The detailed description of those shall be left to the technical specification for the project implementation. The following remarks emphasize therefore the specificities of the Clearinghouse, namely the Interoperability Assets.

2.1 Candidate Assets

Any information asset that is or has been actually used to provide syntactic or semantic interoperability in a distributed information system may be considered as candidate to be published in the pan-European Clearinghouse. These “candidates” notably include:

- Formal specifications of data structures used for data interchange among heterogeneous sub-systems or components. Such specification may be encoded using various formats e.g.: XML schema (XSD), XMI files, UML documents.

- Hierarchical classification scheme such as thesauri, products and/or services nomenclatures. They may be encoded using various machine-readable formats, e.g.: RDF, Excel files (.xls), ad-hoc XML format generated by the export procedure of a relational database management system.

- Hierarchical directories or registries. In most cases they will be available encoded in an ad-hoc XML format generated by the export procedure of a RDBMS or LDAP directory system.

- Flat dictionaries encoded in cvs, xls, or XML format.

The criteria that should be considered to eventually decide to publish a candidate asset are (open list):

- Usage: importance of potential applications for e-Gov sectors
- Usable under an open licence
- Sufficiently documented, at least in one language, preferably in several
- Originality: an equivalent asset can’t easily be produced from scratch
- Overall quality: completeness, consistency.
- Expected long-term support and maintenance by the producer

These criteria and perhaps others will be used for carrying-out the task “Validate candidate asset” described in section 3.1.
Principles and operational method for identifying and selecting candidate assets are described in section 4.

2.2 Terms of Use

To encourage reuse of Interoperability Assets and production of new ones incorporating part or all of existing ones, it is of high importance to ensure that those assets selected for publication by the Clearinghouse are distributed with an explicit and open licence.

Explicit means that the terms and conditions of reuse must be clearly stated in a formal document distributed with the asset.

Open means that non-profit usage of assets should be free to any user, private company or public body.

2.3 Asset Documentation

Any asset must be documented in one or preferably several languages. Documentation should include:

- Technical documentation explaining how the asset is built and how it is supposed to be exploited in an information system;
- Various information about the origin of the asset, its history, identification of the producer, indications on the future evolution of the asset;
- Information on the actual information systems in which the asset is used.

2.4 Structure of Interoperability Assets

The various categories of Interoperability Assets (IA) are described in the Working Paper on Semantic Interoperability. An IA may be an XML Schema (specification of a data structure), a dictionary, a thesaurus or nomenclature, an ontology, a mapping-table between two existing thesauri, a directory or registry of other assets. Assets are encoded using a formal data structure, e.g.: XSD, RDF, CSV. A single Interoperability Asset may be spread onto several physical files.

To enable reuse by third parties, any asset must be distributed with companion metadata and documentation that must include at least (non limitative list):

- Name of the asset
- Version number
- History of versions mentioning possible incompatibilities from one version to another
- Date of last modification
• Name and contact address of the person or entity responsible for correcting errors or bugs
• Brief technical description and instructions for use
• Terms of use (licence) only if the Clearinghouse standard licence is not applicable (see below section on the process).

The companion documentation may also include additional contextual documentation.

This companion metadata and documentation is produced and updated by the same person or entity producing the asset itself, and is called “internal documentation”. In the sequel we call “published asset” (or in short “asset”) a package of files associating the Interoperability Asset itself and its companion internal metadata and documentation. This package may be distributed as a .zip file, or any other convenient mean.

The Clearinghouse, acting as a publisher, may decide to provide additional documentation with the assets that it distributes. This external documentation may include items such as (non-limitative list):

• Overview presentation of the asset, and associated use-cases
• Description of projects and operational information systems in which the asset is used
• Translations of the technical descriptions in one or several additional EU languages
• Data samples in several languages when relevant
• Links to other related published assets

The external documentation must include:

• Terms of use (licence). The nature of this licence is discussed in the section “Terms of use”.

Last but not least, to enable effective search and retrieval of published assets by users, and to support various asset management activities, the Clearinghouse must describe these assets with metadata elements. The metadata system used to index assets must include elements used for asset management and for asset retrieval.

A minimum list of metadata elements is (non-limitative list):

• Asset name
• Asset category
• Encoding
• Supported languages (if relevant)
• Version number
• History track
• Identification of origin (administrative entity or company providing the asset)
• Identification of the project in which the asset has been produced if relevant
• Contact person, e-mail, address, phone number
• Target sectoral domains
• Brief summary

In summary, a published asset is a set of associated information elements, represented in figure 1.

Figure 1: Document Model of an Interoperability Asset

It may be noted that an Interoperability Asset has quite similar structure and properties than a software package, except that its key-component is not an executable code but either a schema, a mapping-table or an encoded terminology or ontology. As a result, an Interoperability Asset Clearinghouse shares many features with a software-distribution service.

2.5 Guidelines and Reports

This category includes guidelines, project reports, technical reports that are considered as valuable contributions to its task to "establish/publish methodologies, disseminate best-practices, return on experience regarding standards and tools that may help national agencies and companies – as well as their counterparts at the European level – in their efforts for creating, validating and updating Interoperability Assets." (See chapter 1.3)
2.6 Local vs. Central Storage

Asset Packages, External Documents and Miscellaneous documents may be stored either on a national or regional server under the control of a direct or indirect contributor. In that case, they are called Locally Stored Resources or in short Local Resources in the sequel.

These assets and documents may alternatively be stored on the central Clearinghouse server. In that case, they are called Centrally Stored Resources or in short Central Resources in the sequel.

As explained in next section “Functionality”, named links and references may be freely created between Local and Central Resources. As a general principle, location of the resources is transparent to the end-user.
3 Functionality and Architecture

Note: Functionality is only briefly described in this section. The “who” and “how” are described in section “General Process overview”.

This section describes the functionality and architecture of the Clearinghouse service.

Functionality is described in terms of the major functions and features that the Clearinghouse should offer to the user. It is described in logical terms, regardless of the way the underlying service is implemented.

The proposed architecture is a logical one, which describes one possible way of organising software modules in order to provide an implementation of the recommended functionalities.

3.1 Functionalities of the Clearinghouse Service

The major functionalities that should be offered to the user and/or administrator are as follows.

3.1.1 Extensions of the Registry Information Model

As mentioned in the previous section, the metadata system used to index assets must be extensible. The Clearinghouse server must therefore provide the possibility to easily enrich the descriptive system, adding new attribute declarations without any programming. This is done by defining new Slot Instances (see definition in the section on Data Model) by the Server Administrator (see definition of this role in the actors’ section).

3.1.2 Asset Publishing

This is to enable users with an adequate level of authorization to publish assets on the server. Asset publishing includes:

- Extract internal metadata and use to fill-in relevant external metadata fields (manual task with quality control and possibly translation);
- Fill-in the form(s) through which external metadata describing the asset is created;
- Upload the asset on the Clearinghouse server in case of central storage, or validate the HTTP link pointing to the original asset in case of local storage;

6 The term “user” refers to a general category of roles and attached rights such as “publisher”, “contributor” etc.
• If the asset is a classification scheme (thesaurus, ontology, nomenclature etc.), automatically create a formal representation of this scheme that can be used by the gateway functionality described hereafter;

• Publish the associated external documentation such as overview presentations in several languages, relevant licence document, etc. and create the links associating these documents to a given Interoperability Asset.

3.1.3 Asset Versioning

This is to enable users with an adequate level of authorization to replace a published asset by a new version. The old version is kept in the service, with an indication that it is obsolete and replaced by the new item. Versions are automatically or manually numbered. Versioned assets are time-stamped at publication time.

Except for the version number and time-stamp, the metadata descriptors are kept untouched from one version to another of a given asset. However, the administrator (or any user with adequate authorization level) may modify any metadata element from one version to another.

3.1.4 Asset Storage

Published assets may be stored either:

• On a server managed by the entity in charge of producing and updating the asset (local resource). In that case, the Clearinghouse server acts as a pure registry. It contains only the external documentation that may have been associated with the asset at publication time, and the indexing metadata. This metadata is of course associated with a URL pointing to the original asset.

• On a central server managed by the Clearinghouse Manager. In that case, the Clearinghouse server is both an asset registry and an asset-storage.

Local storage is of course more scalable and should be preferred whenever it is technically and economically feasible. Local and central storage are not exclusive. It is likely that part of the collection of published assets will be stored centrally because some contributors will not want to bother running their own distribution servers.

Seen from the Clearinghouse end-user, local and central storage should be equivalent. Storage location should be transparent.

The internal documentation is always stored on the same server than the asset itself. The external documentation (if any) may be stored indifferently as local or central resources.
The indexing metadata used for asset retrieval is always stored on the Clearinghouse central server. Local metadata may exist in any language but is not used by the Clearinghouse indexing and retrieval mechanisms, to avoid putting strong constraints on all contributors regarding their own classification schemes.

3.1.5 Asset Retrieval

This functionality is twofold:

- Enable end-users to search the collection of published assets, using a query form in which values may be selected for a subset of metadata elements.
- Enable agents (i.e.: programs) to query the collection database using a query language over a communication protocol.

3.1.6 Collection Browsing

Collection browsing is generally associated to asset retrieval. The retrieval functionality returns a list of assets. The collection browser enables the user to explore this list, choosing a sorting criterion (e.g.: by date, by category, by origin etc.). The list is presented by pages. The user and/or the Webmaster may choose which metadata elements are displayed in the table.

3.1.7 Browsing a Classification Scheme

This comprises online browsing of any registered classification scheme such as a thesaurus, a nomenclature, or an ontology. The user selects one scheme and may unfold sub-trees. Selection of a leaf node leads to displaying its properties, e.g.: scope note, references to other published resources, and equivalent terms in other taxonomies.

3.1.8 Asset Documentation Management

This is to enable the Clearing Manager or any user with adequate authorization level to publish an external document and associate it to all versions of an asset or to a specific version of it. Also enables the same users to un-publish external documents.

3.1.9 Workflow Monitoring

A permanent monitoring of the Clearing Process is provided, ensuring that all actors are informed of the occurring events that are relevant for their role, and that they perform the actions that they are supposed to do within a fixed allocated time.

The workflow is specified as a set of rules using a declarative or a graphical language. Each rule associates an event (creation/modification/deletion of some information element by some Actor), a state (set of values for some metadata elements and workflow indicators) and an
action. The action in most cases results in sending a message (warning, reminder, etc.) to some user or group of users.

3.1.10 Semantic Gateway/Validator

This tool should enable an end-user to check if some data sample is consistent against a given Interoperability Asset (validation). It can also be used to transform a given data sample by applying a mapping mechanism from one Interoperability Asset to another (gateway).

Example: Let us suppose that a standard European classification of life events has been published on the Clearinghouse, and that mappings are available between each of the national classifications used in the U.K., Germany and Spain, and the European standard one. The gateway/validator should enable a user to interactively select a source term in one of the national classifications, a target classification, and obtain immediately the corresponding term if a mapping exists. The same functionality should also be accessible to programme invocation through SOAP.

3.1.11 User Management

The user management will provide for user registration and their allocation to one or several group(s) corresponding to different roles. It will control the access to the service, allocation of access-rights to user groups, etc.

3.1.12 Publish Miscellaneous Documents

This category of document is defined in chapter 2 “Published Content”. This functionality enables users with adequate authorization level to publish such documents, i.e.: to associate to the URI of the resource indexing metadata that can be used later for document classification, for information retrieval, and for announcement to other users via RSS news feed.

It is suggested that the metadata system used for the "miscellaneous documents" should conform to the Dublin-core standard.

The functionality also enables to create links between already published assets of any category, and the newly published miscellaneous document.

3.1.13 Generic Web-centric Communication Functionality

This is to enable Actors to communicate among each other and with the Clearinghouse management, notably:

- Submit new candidate assets to the Clearing Process;
• Publish comments and evolution requests related to assets;
• Publish requests for new assets;
• Freely discuss the pros and cons of existing assets, and their emerging requirements.

3.2 Architecture of the Clearinghouse Service

The Clearinghouse is a distributed service associating local asset repositories, a central metadata registry associated to a middleware implementing content lifecycle management and workflow monitoring functionality, a central asset repository, and a web-service access point.

![Component diagram of the Clearinghouse](image)

Figure 2: Component diagram of the Clearinghouse

The core component of the system is the metadata registry. The metadata registry provides both a data-model, and an API implementing the software services requested by the user-level functionality.

We recommend basing the Clearinghouse metadata registry on the ebXML Registry set of standards: OASIS/ebXML Registry Information Model, and OASIS/ebXML Registry Services Specification in their latest approved version. The reasons for this recommendation are as follows:
This standard has been specifically designed to support distributed metadata systems identifying Interoperability Assets such as schemas, domain-specific registries, specifications, terminologies and web-services. The standard therefore fits well with the structural and functional requirements of the Clearinghouse.

The ebXML Registry Information Model proposes a Classification Model that is well suited to implement the Gateway functionality that is required by the Clearinghouse;\(^7\)

The standard is made available in form of commercial products as well as in form of Open Source implementations, hence enabling easy developments of proofs-of-concept.

The standard is supported by a large constituency of industries, IT providers and/or users.

The standard is consistent with the technical choices already made by the Commission, in particular by IDABC, and by the Member States regarding interoperability architecture.

### 3.3 Mapping the Clearinghouse Data-model onto the ebXML Standard

The following table describes how the Clearinghouse data-model may conform to the ebXML Registry Data Model. The left column provides brief definitions of the most relevant ebXML classes and the right column explains how each class can be used for the actual implementation of the Clearinghouse data-model.

We conclude from this table that the model is well-adapted and that the mapping is straightforward.

<table>
<thead>
<tr>
<th>EbXML Classes</th>
<th>Clearinghouse objects and concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>RegistryObject</td>
<td>The RegistryObject class is an abstract base class used by most classes in the model. It provides minimal metadata for registry objects. It also provides methods for accessing related objects that provide additional dynamic metadata for the registry object.</td>
</tr>
<tr>
<td>External Metadata</td>
<td><em>External Metadata</em> as defined in section 2.4 should be implemented as instances of the RegistryObject class, hence providing basic information retrieval functionality to search the content published on the Clearinghouse. RegistryObjects are also used to describe registered users and contributing organizations.</td>
</tr>
</tbody>
</table>

---

\(^7\) (ebRIM) OASIS/ebXML Registry Information Model v2.5 - OASIS/ebXML Registry Technical Committee, June 2003;
(epRS) OASIS/ebXML Registry Services Specification v2.5 - OASIS/ebXML Registry Technical Committee, June 2003.
### EbXML Classes

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RepositoryItem</strong></td>
<td>A RepositoryItem class is an object (e.g., an XML resource) that resides in a repository (local or central) for storage and safekeeping. Each RepositoryItem instance is associated with a RegistryObject instance. The RegistryObject catalogs the RepositoryItem with metadata.</td>
</tr>
<tr>
<td><strong>Slot</strong></td>
<td>Slot instances provide a dynamic way to add arbitrary attributes to RegistryObject instances. This ability to add attributes dynamically to RegistryObject instances enables extensibility within the Registry Information Model.</td>
</tr>
<tr>
<td><strong>Association</strong></td>
<td>Association instances are RegistryObject instances that are used to define many-to-many associations between objects in the information model.</td>
</tr>
<tr>
<td><strong>ExternalLinks</strong></td>
<td>ExternalLink instances are RegistryObject instances that contain a named URI to content external to the central Registry. Unlike managed content, such external content may change or be deleted at any time without the knowledge of the Registry. A RegistryObject instance may be associated with any number of ExternalLinks. The ExternalLink enables this capability. A potential use of the ExternalLink capability may be in a GUI tool that displays the ExternalLinks to a RegistryObject. The user may click on such links and navigate to an external web resource referenced by the link.</td>
</tr>
<tr>
<td><strong>ClassificationScheme</strong></td>
<td>ClassificationScheme instances are RegistryEntry instances that describe a structured way to classify or categorize RegistryObject instances. The structure of the classification scheme may be defined internal or external to the registry, resulting in a distinction between internal and external classification schemes.</td>
</tr>
<tr>
<td><strong>ClassificationNode</strong></td>
<td>ClassificationNode instances are RegistryObject instances that are used to define tree structures under a ClassificationScheme, where each node in the tree is a ClassificationNode and the root is the ClassificationScheme. Classification trees constructed with ClassificationNodes are used to define the structure of Classification schemes or ontologies.</td>
</tr>
</tbody>
</table>

### Clearinghouse objects and concepts

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asset Packages, External Documents, and Miscellaneous Documents</strong></td>
<td>All are represented as RepositoryItems. This applies to Local resources as well as to central ones.</td>
</tr>
<tr>
<td><strong>Slots</strong></td>
<td>Slots are used to provide the extensibility functionality described under section 3.1.1 «Extensions of the Registry Information Model». For example, if the Clearing Manager wants to add a “CheckedBy” attribute to each RegistryObject instance that is submitted by a Contributor, it can do so by adding a slot with name “CheckedBy” and value containing the identification of the contributor. Specific slots will also be needed to support Assets versioning mechanisms.</td>
</tr>
<tr>
<td><strong>Association</strong></td>
<td>Association is used to represent (a) relations between Asset Packages, and (b) relations between an Asset Package and External Documents.</td>
</tr>
<tr>
<td><strong>ExternalLinks</strong></td>
<td>ExternalLinks may be used in the Clearinghouse to link Asset Packages to contextual information. For example, an organization submitting a DTD could use an ExternalLink to associate the DTD with the organization's home page.</td>
</tr>
<tr>
<td><strong>ClassificationScheme</strong></td>
<td>A ClassificationScheme instance is metadata that describes a registered taxonomy. Thesauri, nomenclatures or ontologies are described in the Clearinghouse using instances of ClassificationScheme Class.</td>
</tr>
<tr>
<td><strong>ClassificationNode</strong></td>
<td>Any node of a registered Thesaurus, nomenclature or ontology is represented as an instance of ClassificationNode. Associated methods are available to implement the browsing functionality described in section 3.1.7, whatever may be the original encoding format of the Asset.</td>
</tr>
<tr>
<td>EbXML Classes</td>
<td>Clearinghouse objects and concepts</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Classification</strong></td>
<td>This Class enables to index published Assets using entries of one or several taxonomies. This may be useful for instance to associate an Interoperability Asset to one or several target sectors or business domains for which the Asset is relevant.</td>
</tr>
<tr>
<td>Classification instances are RegistryObject instances that are used to classify other RegistryObject instances. A Classification instance identifies a ClassificationScheme instance and taxonomy value defined within the classification scheme.</td>
<td></td>
</tr>
<tr>
<td><strong>RegistryPackage</strong></td>
<td>RegistryPackage is suitable for representing the relationship among several linguistic versions of an Interoperability Asset. It can also be used for representing the set of successive versions of a given Asset.</td>
</tr>
<tr>
<td>RegistryPackage instances are RegistryEntry instances that group logically related RegistryObject instances together.</td>
<td></td>
</tr>
<tr>
<td><strong>AuditableEvent</strong></td>
<td>AuditableEvent should be used directly as proposed by the ebXML standard to provide traceability of modifications from one version of an Asset to the next.</td>
</tr>
<tr>
<td>AuditableEvent instances are RegistryObject instances that are used to provide an audit trail for RegistryObject instances.</td>
<td></td>
</tr>
<tr>
<td><strong>User</strong></td>
<td>User Class should be used by the Clearinghouse as proposed by the ebXML standard.</td>
</tr>
<tr>
<td>User instances are RegistryObject instances that are used to provide information about registered users within the Registry. User objects are used in audit trail for RegistryObject instances.</td>
<td></td>
</tr>
<tr>
<td><strong>PostalAddress</strong></td>
<td>PostalAddress should be used by the Clearinghouse as proposed by the ebXML standard.</td>
</tr>
<tr>
<td>PostalAddress is a simple reusable Entity Class that defines attributes of a postal address.</td>
<td></td>
</tr>
<tr>
<td><strong>EmailAddress</strong></td>
<td>EmailAddress should be used by the Clearinghouse as proposed by the ebXML standard.</td>
</tr>
<tr>
<td>EmailAddress is a simple reusable Entity Class that defines attributes of an email address.</td>
<td></td>
</tr>
<tr>
<td><strong>Organization</strong></td>
<td>Organization should be used by the Clearinghouse as proposed by the ebXML standard.</td>
</tr>
<tr>
<td>Organization instances are RegistryObject instances that provide information on organizations such as a Submitting Organization. Each Organization instance may have a reference to a parent Organization.</td>
<td></td>
</tr>
<tr>
<td><strong>Service</strong></td>
<td>The three classes Service, ServiceBinding and SpecificationLink are provided to offer web-service functionality to third-party software. The Clearinghouse implementor may consider using the web-service architecture to provide the functionality described in section 3.1.10 “Semantic Gateway Validator”. According to this technical choice, the SOAP interface to the validator would be published as a Service that would have a Binding to a WSDL specification describing the exact structure of the supported SOAP messages.</td>
</tr>
<tr>
<td>Service instances are RegistryEntry instances that provide information on services (e.g., web services).</td>
<td></td>
</tr>
<tr>
<td><strong>ServiceBinding</strong></td>
<td></td>
</tr>
<tr>
<td>ServiceBinding instances are RegistryObject instances that represent technical information on a specific way to access a specific interface offered by a Service instance. A Service has a collection of ServiceBindings.</td>
<td></td>
</tr>
<tr>
<td><strong>SpecificationLink</strong></td>
<td></td>
</tr>
<tr>
<td>A SpecificationLink provides the linkage between a ServiceBinding and one of its technical specifications that describes how to use the service with that ServiceBinding. For example, a ServiceBinding may have a SpecificationLink instance that describes how to access the service using a technical specification in the form of a WSDL or a CORBA IDL document.</td>
<td></td>
</tr>
</tbody>
</table>
4 Organisation and Processes

4.1 Actors

A Clearinghouse is a collaborative project with an extensive networking function. Not only does it require a solid strategy and efficient management, it is as well dependent on motivated contributors and on reliable users. Since its assets are valuable and the processes must be efficient, rights and functionalities of the different “Actors” must be defined.

4.1.1 Direct Contributor

This is a person, a company or a public body who produces an Interoperability Asset and grants the Clearinghouse with the right to distribute this asset. The granted right may be exclusive or non exclusive. The direct contributor is (except for a few exceptions) responsible for maintaining and updating the Interoperability Asset.

In practice, a direct contributor may be for instance the documentation service of a public organisation, the directorate of computer systems of an administration, a cultural organisation, a scientific society, a private IT company, etc.

4.1.2 Indirect Contributor

This is a person, a company or a public body who owns exploitation rights of an Interoperability Asset and grants the Clearinghouse with the right to distribute this asset. The granted right may be exclusive or non exclusive. The indirect contributor is not directly responsible for maintaining and updating the Interoperability Asset.

National Agencies in charge of setting-up interoperability infrastructures and of promoting interoperability standards in their country are typical indirect contributors.

4.1.3 Clearing Manager

This refers to the role in charge of managing the Clearing Process (see chapter 4.2). The Clearing Manager should be nominated by the Sponsoring Organisation (see below) in consultation with the Steering Committee. The role may be allocated to a person within the staff of the Sponsoring Organisation, or may be subcontracted to a private entity (e.g.: a consultant, a service company). In any case, the Clearing Manager reports to the Sponsoring Organisation at the relevant level (see below for this Actor).

Ideally the role of the Clearing Manager should be attributed to the same person, who is responsible for all operational tasks of the Clearinghouse: Apart from the clearing process, he will manage the networking and promotion activities as well as the technical operation.
4.1.4 **Steering Committee**

This is the committee responsible for defining the general strategy that the Clearinghouse should apply to optimise its contribution to improving content interoperability in Europe. The Steering Committee advises the Sponsoring Organisation and recommends actions. It notably advises the Sponsoring Organisation on the relevance and the priority of possible projects aiming at developing new Interoperability Assets. It ensures that projects and initiatives (PEGS, PCIs etc.) supported by the Sponsoring Organisation are aware of the relevant activities carried-out in the Member States at national or regional level, and that everything is done to maximize synergy between European-level actions and local ones.

The Steering Committee should be composed of representatives of Member States and sectors, who are able to contribute to the interests of their stakeholders. All Indirect Contributors are invited to nominate a permanent representative to the Steering Committee. A number of active Direct Contributors should be invited to participate to the working sessions of the Steering Committee. The Clearing Manager participates to the debates of the Steering Committee. The Sponsoring Organisation has a permanent representative in the Steering Committee.

The Committee members may elect a chair for an annual mandate. Alternatively, the Steering Committee may be chaired by the representative of the Sponsoring Organisation.

The Steering Committee should hold face-to-face meetings at least twice a year.

4.1.5 **Technical Advisory Network**

This is the role in charge of quality checking the candidate assets and the new versions of already published ones. The Technical Advisory Network reports to the Clearing Manager.

It is recommended that the Technical Advisory Network should take the form of a European network of experts (consultants, researchers, documentation specialists, staff of contributing organisations etc.). For each task in which technical expertise is needed (e.g.: Validate possible asset, check submitted asset, check new version) the Clearing Manager should select a few experts from this network (two or three) and ask them to check the Clearinghouse activities and products for quality.

The Advisory Network will also be responsible to outline and approve Clearinghouse policies and guidelines.

Network members may be invited to participate and bring their expertise to the working sessions of the Steering Committee.
4.1.6 **Server administrator and Webmaster**

A Webmaster and Server Administrator (including back-office database administration) will take care of the Clearinghouse online service.

The role may be allocated to a person within the staff of the Sponsoring Organisation, or may be subcontracted to a private entity (e.g.: a service company). In any case, the Server Administrator reports to the Clearing Manager.

4.1.7 **Registered User**

This refers to any user who is allowed to retrieve information from the Clearinghouse online service. It is recommended that Registered Users should be identified (real name, work organisation, physical address, phone number). However, because possible users and contributors of a pan-European Interoperability Clearinghouse may come from very diverse private and public organisations, it is recommended that anybody providing valid identification information should be allowed to become a Registered User.

4.1.8 **Sponsoring Organisation**

The organisation which funds the direct expenses of the Clearinghouse Service, nominates its manager, and ultimately decides on the priority among pan-European projects aiming at developing new assets (see section 1.3.1).

4.2 **Publishing Process Overview**

Any information resource managed by the Clearinghouse may be in either of the two possible states “submitted” or “approved”.

Any registered contributor may decide to publish an asset or a report on the Clearinghouse. The contributor fills-in the mandatory *External Metadata* fields, and decides on the location of the published resource (local or central). After publishing, the resource has the status “Submitted”.

Submitted resources may be visible by all Registered Users with a clear visible graphical flag showing that the resource has been submitted but is not yet approved.

Users may send comments on the submitted resource, discuss about it in the forum, propose modifications, etc.

The Clearing Manager is automatically informed by the workflow system of the publication of any new submitted resource. The Clearing Manager must verify that the external metadata are complete and consistent. He may modify or complete the metadata created by the
contributor at publication time. *External Metadata* are under the responsibility and control of the Clearing manager. Links to *External Documents* are considered as external metadata.

The Contributor himself (and not the Clearing Manager) must create a link from the published asset to a license document stating clear terms of reference for reusing the asset. The Contributor is encouraged to link to a standard Clearinghouse licence, available on the central server in several EU languages. However, the contributor may decide to link to his own licence document. In that case, this licence document must be published as external document in at least two EU languages.

It is the responsibility of the Clearing Manager to organize the technical assessment of the resource. Resource validation may take several months and involve several members of the Technical Advisory Network and a large user-group, or may be very short and straightforward. It is likely that newly submitted versions of already approved resources will be validated quite easily and rapidly.

Remarks and proposed modifications (if any) provided by early users and by the Technical Advisory Network are forwarded to the Contributor who may consider them and publish new versions of the submitted resource.

It is the responsibility of the Clearing Manager to decide that a published resource may have the status of an approved resource. When the resource is approved, a clear graphical flag shows to all users that the resource has been approved.

As a general rule a resource should be approved only after it has been *actually used* in a pan-European information system, either prototype or operational. This rule is a guarantee that Interoperability Assets approved by the European Clearing Process meet the criteria that make them usable in pan-European systems.

### 4.3 Responsibilities and Rights in the Clearing Process

<table>
<thead>
<tr>
<th>TASK</th>
<th>Resp. Actor</th>
<th>Involved actors</th>
<th>Trigger event</th>
<th>Short description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology surveillance</td>
<td>Clearing Manager</td>
<td>Steering Committee Technical Advisory Network</td>
<td>Permanent</td>
<td>The permanent activity through which the Clearinghouse staff (represented in the model by the Manager), the Steering Committee members, the Technical Advisory Network members, the contributors and the users detect the announcement of new standards, technologies or Interoperability Assets that may be relevant to their mission, and inform</td>
</tr>
<tr>
<td>Action</td>
<td>Role</td>
<td>Other Role</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------------------</td>
<td>---------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Submit new asset</td>
<td>Direct or Indirect Contributor</td>
<td>Modified asset</td>
<td>The task through which a Contributor submits an Interoperability Asset for publication to the Clearinghouse manager.</td>
<td></td>
</tr>
<tr>
<td>Submit new version</td>
<td>Direct or Indirect Contributor</td>
<td></td>
<td>The task through which a Contributor submits a new version of a published Interoperability Asset to the Clearing manager.</td>
<td></td>
</tr>
<tr>
<td>Validate candidate asset</td>
<td>Clearing Manager</td>
<td>Technical Advisory Network</td>
<td>The task through which a new asset submitted for publication is assessed by members of the Technical Advisory Network and the Clearing Manager takes an informed decision on publishing it or not. The assessment results either to immediate publication, or to the decision to produce additional external documentation, or to the decision to reject the asset.</td>
<td></td>
</tr>
<tr>
<td>Check new version</td>
<td>Clearing Manager</td>
<td>Technical Advisory Network</td>
<td>The quality assessment of a new version submitted for publication, and the verification of its backward compatibility with the existing version.</td>
<td></td>
</tr>
<tr>
<td>Request asset</td>
<td>Reg.User</td>
<td>Actor choice</td>
<td>The task through which a User informs the Clearinghouse Manager and (presumably through him) the Steering Committee, that some specific asset is required by a given PEGS Project and cannot be found on the Clearinghouse service.</td>
<td></td>
</tr>
<tr>
<td>Search asset</td>
<td>Reg.User</td>
<td>Actor choice</td>
<td>The task through which a User tries to identify through the Clearinghouse an Interoperability Asset that he needs for a given project.</td>
<td></td>
</tr>
<tr>
<td>Return on experience</td>
<td>Reg.User</td>
<td>Actor choice</td>
<td>The task through which registered user may provide feedback on the quality, adequacy, usability, etc. of an Interoperability Asset. The feedback is collected by the Clearinghouse service and forwarded to the asset producer. All feedback messages regarding a given asset may be consolidated and classified in a single document that is forwarded to the Steering Committee and to the asset producer. The Clearing Manager may propose to the Support organisation to support the production of such “feedback documents”.</td>
<td></td>
</tr>
</tbody>
</table>
| Develop new asset             | Direct                        | Supporting                      | The task through which one or several:
<table>
<thead>
<tr>
<th></th>
<th>contributor</th>
<th>organisation</th>
<th>choice</th>
<th>contributors produce a new Interoperability Asset.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Modify Asset</strong></td>
<td>Direct contributor</td>
<td>Return on experience</td>
<td>Modification of an existing asset taking into account the requests or remarks from its users.</td>
<td></td>
</tr>
<tr>
<td><strong>Produce Miscellaneous documents</strong></td>
<td>Any user or contributor</td>
<td>Actor choice</td>
<td>Production of a Miscellaneous Document (MscDoc) by any Actor or non Actor, i.e.: an external entity without any role in the Clearinghouse. Production of a MscDoc may be recommended of requested by the Steering Committee and/or by the Support Organisation.</td>
<td></td>
</tr>
<tr>
<td><strong>Publish Miscellaneous documents</strong></td>
<td>Clearing Manager</td>
<td>Technical Advisory Network</td>
<td>Available Document</td>
<td>Publication of a Misc. document, including the production of its associated metadata and the creation of the links with the already published assets. (see definition of misc. documents in section 2 on Published Content).</td>
</tr>
<tr>
<td><strong>Publish Asset</strong></td>
<td>Clearing Manager</td>
<td>Technical Advisory Network</td>
<td>New version approved</td>
<td>Make available online, an approved new version of an asset, including the production of its associated metadata and the creation of the links with the already published assets.</td>
</tr>
</tbody>
</table>

### 4.4 IPR

*Responsible actor:* Steering Committee

*Objective:* Reach agreement on terms of use for Interoperability Assets.

*Method:* The Clearing Manager should propose a first version of a possible licence for assets reuse, inspired by the EUPL, if it is approved by the Commission, or by the Gnu Public Licence. The supporting organisation should distribute the draft to the Steering Committee members, collect feedback, and organize a meeting to have the Steering Committee discuss the text and possibly agree on some modifications.

---

Contributors will not all agree with the Clearinghouse policy, and the Clearinghouse should not prevent the publication of assets with different IPR policies. However, putting in place a reference IPR policy must be central to the Clearinghouse, and contributors must be constantly encouraged to use it. Such a policy will have many advantages:

- Contributors might come from various institutions with different backgrounds. The existence of the IPR policy will provide contributors with a well thought-out framework of work;
- The existence of the IPR policy will alleviate the legal barriers for contributors who are more interested in work on the subject matter;
- The Clearinghouse IPR policy, like the Clearinghouse registry, is a tool that will be put at the disposal of contributors, thereby facilitating their work;
- Having a single IPR policy will simplify the sharing, reuse and cross-referencing of assets available on the Clearinghouse;
- Having a single IPR policy will simplify their use by PEGS and other projects, since such policy will be defined with the needs of these projects in mind;

### 4.5 Quality Policy

The Quality Policy ensures that Interoperability Assets published by the Clearinghouse meet a number of explicit quality criteria. The Quality Policy notably defines:

- How new assets proposed for publication are assessed:
  - Syntactic conformance to standards (e.g.: RDF for semantic assets, XML schemas for syntactic structures, ebXML framework for orchestration of data exchange⁹).
  - Semantic coverage of the target domain (is the asset sufficiently complete for an actual operational use)
  - Internal consistency
  - Compatibility with other assets e.g.: if the asset is a semantic taxonomy, can it be used out-of-the-box with some identified structural assets, i.e.: core-component or XML schema?
  - Actual use of the asset in an existing system
- Multilingualism
- Availability and quality of technical documentation

- How proposed modifications leading to a new version are assessed:
  - Backward compatibility of the new version with existing applications exploiting the asset in the currently released version
  - Non-redundancy of the proposed modification with other proposals already in the assessment pipeline
  - Has the new version already been tested in a prototype application or a new version of a deployed application

The Quality Policy should be fully defined in a Quality Document. This document should be produced by a consultant acting on behalf and under the control of the Commission. The Quality document should be validated by the Steering Committee.

### 4.6 Conflict Resolution

**Note**: In business-process modelling, “conflict” is a generic term, which does not refer to emotional situations. A conflict occurs whenever one Actor generates an event (action, no-action or choice), which creates a state in the process that precludes another actor to progress in its own task towards normal achievement.

Conflicts may be solved through negotiation, through mediation, through task interruption or cancellation, or by modifying the process flow.

Conflicts that are likely to occur should preferably be foreseen, and their resolution method should be explicit, known and understood by all actors potentially involved in the conflict.

<table>
<thead>
<tr>
<th>Conflict description</th>
<th>Possible resolution method(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A potential Contributor does not accept to grant rights related to his asset along the standard Clearinghouse licence</td>
<td>If the asset is considered as sufficiently valuable and original, publish it with specific licence requested by contributor. Inform clearly and visibly users at download time of this particular licence. Actor: Clearing Manager</td>
</tr>
</tbody>
</table>

9 For a list of relevant standards, see reports: “Use of XML based Business Frameworks for IDA” and “Technical description of target eGov infrastructure for delivering PEGS, Technology and Market Trends”
A candidate asset does not meet the requested quality criteria and the contributor does not have the necessary means to comply.

<table>
<thead>
<tr>
<th>Case 1: Insufficient Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the asset is considered as sufficiently valuable and original, support production of additional documentation on Clearinghouse budget.</td>
</tr>
<tr>
<td>Try to ask users of the asset to supply missing information (if relevant).</td>
</tr>
</tbody>
</table>

A candidate asset does not meet the requested quality criteria and the contributor does not have the necessary means to comply.

<table>
<thead>
<tr>
<th>Case 2: Low Quality, Inconsistencies, Incompleteness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Find a second level contributor: indirect contributor or third party interested in the product and able to produce a substantially improved version.</td>
</tr>
<tr>
<td>Obtain agreement for considering the second level contributor as responsible for future versions.</td>
</tr>
</tbody>
</table>

A contributor does not produce a new version within expected period

<table>
<thead>
<tr>
<th>Case 3: No New Version Produced</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the asset is considered as sufficiently valuable and original, propose some support (financial, human) for producing the new version.</td>
</tr>
<tr>
<td>Setup a user group who can contribute to the work.</td>
</tr>
</tbody>
</table>

Several independent contributors propose different competing assets for the same application domain

<table>
<thead>
<tr>
<th>Case 4: Multiple Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask detailed assessment of pros and cons of each asset to Technical advisory network.</td>
</tr>
<tr>
<td>Publish the competing assets meeting requested quality criteria, and let users decide which is best for their needs.</td>
</tr>
</tbody>
</table>

Several users request divergent changes in a given asset

<table>
<thead>
<tr>
<th>Case 5: Divergent Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propose to the contributor to ask an independent recommendation from the Technical advisory network.</td>
</tr>
</tbody>
</table>

Several users request a modification in an asset, on which the contributor does not agree.

<table>
<thead>
<tr>
<th>Case 6: Modification Disagreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organize meeting with all interested parties, plus one or several Technical Advisory Network members.</td>
</tr>
</tbody>
</table>

5 Success Factors

The Working Paper on Semantic Interoperability as well as the national experiences with Clearinghouse initiatives suggests that there may be several decisive success factors when implementing a European XML-Clearinghouse.

5.1 Political Commitment of the European Commission

The Clearinghouse is an operational entity offering a service. This is very different from a public entity realizing a project via public tender or via a grant.

---

10 Another operational service entity supported by the EC but controlled by a consortium is the European Software Institute (ESI), installed in Bilbao, Spain.
Expectations from actors regarding an operational entity are much more demanding than they are towards a funding agency. One may expect from an operational entity long-term sustainability, reliability and quality of service. To meet these expectations, an operational Clearinghouse will obviously need recurrent financial support. It will also need a visible long-term political support. All national and sectoral actors at EU-level should be convinced that the European Clearinghouse is here permanently to offer high quality services and will not vanish in two years at the end of some support contract – or Commission programme.

Building such political presence and acceptance will take time. Section 6.1 proposes to start with a two-year long Clearinghouse Development Project that will confirm the relevance of the objectives, validate the operational process, and will make the Clearinghouse present on the European scene as a credible actor. National and sectoral actors ("stakeholders") will be tightly associated to this Clearinghouse Development Project, notably through their participation in the Steering Committee (see section 1.4.2). Thanks to this direct participation, they will have increasing confidence that the Clearinghouse is a good instrument to help them collectively build a true pan-European information space.

5.2 Synergy with National and Regional Agencies

Several EU Member States have already deployed some form of an Interoperability Clearinghouse. The most advanced of these facilities are briefly described in the Working Paper on Semantic Interoperability

Others may be started in a near future. Of course, a large part of the content published on these local services is targeted to domestic usage: it is quite often documented only in the local national language, and it matches the requirements and practices of the local administrations and organisations that contribute to or use it.

However, part of this content may prove valuable for pan-European usage, possibly after adding some documentation in one or several EU languages, and/or possibly mapping it to their equivalent asset used in other countries or organisations. Moreover, the actors who act as contributors or users to these local Clearinghouses are likely to be also actors in existing or future PEGS in which their organisation may get involved.

Such national or regional services should therefore be considered as local nodes of a global pan-European Interoperability Clearinghouse.

In other words, the pan-European Clearinghouse targeted by the present feasibility study must clearly demonstrate its European added-value and its ability to create synergy with its local and/or national correspondents\(^{12}\). Practically this means that the Clearinghouse (represented by its Manager and the Sponsoring Agency) should

- Stay well aware of the national initiatives regarding interoperability, identify good practices, deployment of new technical facilities, publication of new Interoperability Assets by local contributors, and try systematically to encourage the internationalisation, dissemination and publication of those assets that may be useful to other parties or projects.

- Do not try to impose to national public bodies to change the data structures or the classification schemas used in operational systems, but rather try to help these partners to understand which practical solutions may be designed to provide the requested pan-European interoperability while preserving as far as possible legacy data, services and software systems. One such solution can be the development of pivot (or canonical) classification schemas, onto which national schemas can be mapped. In no other region of the world, the concept of pivot classification schemas is as relevant as it is in Europe.

- Identify the common classification schemas needed by PCI and PEGS projects and be proactive in suggesting to these projects to consider existing national assets that either may give good insights or examples for the creation of the pivot structure, or should be mapped onto this pivot to ensure interoperability with existing local systems.

The Steering Committee will be instrumental in maintaining close and regular contacts with the national and regional public agencies in charge of defining an interoperability strategy in the Member States. The Clearing Manager should have a personal contact with all Steering Committee members, and visit each of them in their premises at least once at the beginning of the process, and then each time the business requires it.

### 5.3 Permanent Collaboration with EU Entities

Many different EU entities have a strong interest in deploying interoperable pan-European systems. One can think notably of the IST Programme, the sectoral Directorates of the

---

\(^{12}\) This principle is perfectly consistent with the Austrian initiative, first launched at the Ministerial Conference in Como in 2003, for a European eGovernment Resources Network. The proposal is summarized in the document "European eGovernment Resource Network" published by the Bundeskanzleramt from Austria.
Commission, EUROSTAT, the European Patent Office, the European Parliament, the Court of Justice. The Clearinghouse entity should work to demonstrate to all these actors and perhaps others that it is an effective and available resource centre where they can get support, technical advice and assets to address content interoperability issues. It should also offer them a showcase through which these entities may publicize their own contribution to the pan-European global information space.

The Clearing Manager should develop a closely-knit network of contacts at the adequate level in the various EU entities, which are actually or potentially involved in interoperability-related projects.

5.4 Close Follow-up of PCI and PEGS Requirements

This is by far the most important success factor, which should govern the Clearinghouse activity for at least two reasons:

- These projects, because of their European dimension, require specific Interoperability Assets, which cannot be (or are very unlikely to be) developed either by other international standardisation groups or by any isolated national entity. This is due both to the multilingualism of Europe, but also to the fact that the European Union is built on an original model in which no federal agency or entity has the possibility to impose technical standards to national administrations for their operational information systems. In no other region of the world, the concept of pivot classification schemas on which national ones may be mapped onto is as relevant as it is in Europe. The European Interoperability Clearinghouse will fully demonstrate its specific usefulness if it is able to answer to the specific requirements of projects, which are originating in the European dimension.

- These projects were and will be funded (at least partly) by public money awarded by the European Commission and in many cases by Member States. Therefore they can't ignore their obligation to optimise their resource spending nor should they underestimate the importance of demonstrating in a visible and tangible way that they have done the best to meet this commitment.

Collaborating with the European Interoperability Clearinghouse will be a clear sign that these projects have taken seriously their obligation, by attempting to reuse existing assets whenever possible, by applying proven methods established through past EU projects, and by offering to other future projects to benefit from their own experience and developments. For those projects directly supported by IDABC, this active collaboration with the European Interoperability Clearinghouse should even be
a contractual obligation that partners should accept to benefit from Commission funding.

Existing pan-European information systems may encounter the need to improve their service, hence develop new functionality based on Interoperability Assets. Future Projects of Common Interest (PCI), and those aiming at deploying PEGS will likely require Interoperability Assets (see some examples in the Working Paper). To ensure that PCI and PEGS benefit directly from the services provided by the Clearinghouse, it should be a permanent strategy to establish and maintain contacts with the entities designing and exploiting these systems, to assess their needs related to content interoperability, to check with them how the Clearinghouse may help in detecting and validating Interoperability Assets.

The very first assets that should be published on the Clearinghouse server should be chosen in relation with ongoing PCI and PEGS projects at the time when the Clearing Process will actually become operational.

5.5 Choice and Action Capacity of Clearing Manager

According to the organisational scheme proposed in this report, the Clearing Manager is a key-person in the Clearing Process and his/her motivation and skills are determinant in the success of the whole venture. The person should be chosen carefully. He should have the adequate technical background to understand the content interoperability issues and especially semantic interoperability challenges, the relevance of new standards and technologies, to detect the possible competition and/or redundancy of different candidate assets. He should have the ability and personal credibility to take contact with national and EU public entities and be able to "sell" the whole Clearinghouse idea. He should have been personally in charge of managing a pan-European information Project, e.g.: a PCI or a large IST Project.

The Clearing Process must be reactive and adapt itself permanently to the requirements of new projects and actors. The Clearing Manager must have the requested decision capacity to react to relevant events: unexpected requirements emerging from a Project, publication of possibly competing standards by some international body, etc.

He must also be able to take any contact at the adequate decision-making level with potential project partners, asset producers, administrative entities, and discuss the terms for possible cooperation with the Clearinghouse, speaking on behalf of the Commission Interoperability Clearinghouse.
5.6 Technical and Organisational Credibility

As an organisation aiming to drive the development and adoption of interoperability standards, the Clearinghouse will be accepted only as far as it will demonstrate high technical capability and transparent governance and operating procedures. The Clearinghouse must become within a very few years a reference body. Other actors e.g.: national agencies, EU entities, etc. should become confident that they can rely on its expertise and ability to organize the production, the evaluation and the exploitation of Interoperability Assets.

The IT scene is moving fast: new standards and enabling technologies appear frequently, requirements for new PEGS may emerge from societal events or emerging risks. The Clearing Process should be flexible enough to adapt itself to this changing world. The actors in charge of running the Clearinghouse, and first of all its Manager, should be evaluated notably on their capacity to react in a proactive way to the changes in the societal, political and technical environment.

If the Clearinghouse is organized – as recommended in this report – as a permanent entity, a regular evaluation should be carried-out by independent experts at least every three years. It is suggested to carry out this evaluation at a period where results should be available just before a decision of renewal of contract with the Clearinghouse Manager – and maybe the entire team – should be taken. Evaluation should bear notably on:

- The volume of submissions and publication handled by the Clearinghouse;
- The number of contributors and of registered users;
- The number of projects (PCI, PEGS) actively collaborating with the Clearinghouse;
- The visibility, the credibility and the usefulness of the Clearinghouse (f.e.measured through surveys).
6 Project Planning and Resources

6.1 Rationale and Objectives of a Clearinghouse Development Project

The analysis of the Clearing Process, and of the Actors and responsibilities involved have clearly demonstrated that the set-up of a European Clearinghouse is even more an organisational and motivational challenge than a technical one. The success of the project strongly depends on the amount of contributions it gets and the number of users it is able to attract. This implies that substantial efforts have to be made to win partners for the project and provide services at a convincing quality level.

Although there are already some national Clearinghouses in operation, their experiences can only partly relate to such an institution at the European level, where many more independent partners are involved with differing legal, cultural and linguistic background. Although we are able to define the required functionalities, it is very difficult at this point in time to give solid estimates on the amount of technical and organisational resources to be invested in the long run. This suggests a step-wise approach. In addition, IDABC does not currently have the administrative and financial instruments to commit on supporting a long-term operational activity. Obtaining such instruments will take time, since they will need a legal basis to be approved by the Commission.

For these reasons, it is recommended to start with a Clearinghouse Development Project. This project should last for two years. At the end of this project, the Clearinghouse Prototype should be fully operational: actors should be identified, the main policies guidelines should be in place as well as the links to other Clearinghouses in Europe; the process should be validated, a first set of Interoperability Assets should have been published, and collaboration with selected PCI or PEGS should be on-going. Based on these experiences, a valid evaluation of future requirements can be included in the final project report – as well as proposal for the migration of the project, if needed, due to changing external conditions.

6.2 Work Packages for the Development Project

We start from the assumption that the Development Project will be a Commission project, funded and supervised by the IDABC Programme. This implies that the operational work will be accomplished by external contractors whereas the organization of the governance and Member State contacts are tasks to be performed by Commission staff. However, since the project requires substantial communication and exchange with European partners, we will foresee external support for these activities.
The following sections describe the various work packages that we envisage for the development project.

6.2.1 Set up of the Governance Mechanisms

This work package comprises the following tasks:

- **Establishing and managing the Steering Committee.**
  Responsible: IDABC with organizational support by external contractor.

  The task includes the following activities:
  - Identify potential direct and indirect *contributors* in the Member States and in the relevant EU entities. Identify a contact-person in each of them at the adequate level using mail, phone and on-site visit. Obtain agreement for regular participation to the Steering Committee. A rough estimation of the number of organizations to be contacted during the Project is between 15 and 25.
  - Organize Steering Committee meetings: agenda, invitations, minutes, etc. Three meeting should be organized during the two years of the Project. The first meeting should notably discuss and agree on a precise Mission Statement for the Committee.

- **Establishing and managing the Technical Advisory Network.**
  Responsible: IDABC with organizational support by external contractor.

  The task includes the following activities:
  - Identify a first list of experts with relevant skills. Experts may come from private entities as well as from public organizations. They may be identified notably by screening past and current IST projects and PEGS dealing with interoperability issues. Experts may also be recommended by the Steering Committee members.

- **Establishing and managing partnerships with PCI and PEGS.**
  Responsible: IDABC with organizational support by external contractor.

  Contacts should be taken with project leaders to agree on the practical means and procedures for effective interaction between the Projects and the Clearinghouse. It is likely that only a few PEGS will be active and have relevant interoperability activities during the duration of the Clearinghouse Setup Project. All of them should be contacted.

- **Establishing and managing the Clearing Process** as described in the present paper.
  Responsible: external contractor (Clearing Manager) on behalf of IDABC. The workload related to this task will be highly dependant on the number of contributors and the number of published assets.
6.2.2 Development of Guidelines and IPR

This work package comprises the following tasks:

- Drawing a general policy paper for the Clearinghouse containing details about Clearing Process, quality policy, security requirements etc. Producing this set of documents should have very high priority. A first version should be available not later than three or four months after the start of the Project. The documents should be presented for discussion to the Steering Committee.

- Drawing of a license policy including the adoption of a standard license. The task includes screening the license documents currently used by potential contributors, and proposing a « default » license reflecting international best-practices in (non-commercial) digital assets publishing.

- Drafting other topic-related guidelines on semantic interoperability, and notably technical guidelines that may be published on the Clearinghouse web server.

- Observation of market trends and standards. The Clearing Manager should allocate approximately 20% of his time to market and technology watch and observation of international standardization efforts in relevant areas.

- Managing Commission-internal and external consultation and approval processes - IDABC with organizational support by contractor.

6.2.3 Development, Editing and Publishing of Content

The editorial team is resourced by an external contractor and should ideally work closely with the technical provider. Following a “content management” approach, the team will be responsible for defining and implementing the three main processes i.e. creation/collection, management and publishing of the semantic assets held in the XML metadata registries/repositories.

Interfaces with providers (up-stream), administrators (operational users) and end-users (down-stream) will have to be designed and implemented with a consistent look-and-feel using a web portal approach.

The main activities of this team will consist of analysis of the business processes and interactions with the XML Clearinghouse. Based on scenario definitions, the team will build the whole structure of the Website as well as document the administration processes in order for developers of the system to feed the workflow engine.
Another activity will be the graphical design of the Website according to existing standards. A framework will have to be developed, which will be used by the developers during the implementation of the GUI.

Tasks include

- Analysis of the internal and external business processes
- Documentation of the standards and guidelines
- Documentation of the workflow engine rules
- Set-up of the entire navigation of the website,
- Lay-out,
- News services and interactive sections,
- Project databases,
- As well as the environment of the technical services of the Clearinghouse.

Based on the number of workflow rules to be modelled and the foreseen number of pages of the Website, that is 350 pages, we can estimate the number of different layouts to be designed and set up. Allowing for re-usability of similar pages, not more than 35 different layouts will have to be crafted.

A budgetary estimation for such a project is highly dependent on the technologies used for developing the Website. The team would comprise a “technical” analyst, a graphical designer (part time) and a web master/web designer with programming experience and portal knowledge. The “technical” analyst would need to have an appreciation of the “Content Management” techniques. This team would also be acting as technical authors for some of the documentation.

6.2.4 Development, Management and Hosting of the Technical Platform

For the development part of the project, the technical facility shall be developed and hosted by an external contractor. It is assumed that the contractor will provide the required hardware and calculate the offer accordingly.

The XML Clearinghouse should be developed as a “One Stop” publish & subscribe infrastructure for Semantic and Syntactic Assets as defined in the previous chapters. Without going into too much detail, the technical platform should display the following features:
- Web portal-based User Interface
- Standards-based Web Services access
- Tools to support automatic semantic assets registration
- Workflow for reviewing and posting semantic assets
- Subscription support for change monitoring (push mechanism)
- Tools to support namespace or communities administration
- Point of contact information and forums for semantic assets discussions
- Role-based user administration and authentication mechanisms (security)
- Tools and middleware to support gateway functionalities or mediation services
- Extensive search capabilities within or across semantic assets categories
- Repository and registry based on ebXML standards
- Effective and efficient versioning tools (with impact analysis)
- Usage metrics collection
- Online help and support

The following diagram gives an overview of a possible technical architecture:

---

13 This has been estimated from the number of use cases (see following section) and an average number of pages per use case according to its complexity
Figure 3: Possible technical architecture for the Clearinghouse

Leverage of COTS (commercial-off-the-shelf) components will reduce implementation risks and development time, though the above diagrams shows up the complexity of the required architecture necessary to match the requirements of the XML Clearinghouse (see features list).

The modularity of the architecture and the classification of Semantic Assets argue the case for an iterative development approach. Starting with a first iteration delivering core functionalities for one category of asset, say XML Schemas, the project would then progress towards a final build offering an extended set of features. The “portlet” technology also leads itself to the quick availability of an operational system. During the analysis and design phase, one would have to pay attention to the design of a coherent common class model reusable...
within each “portlet”. Design would be based on the kernel classes’ model underpinning the ebXML registry (see diagram below) taking into account the concepts mapping described in section 3.3.

Having sketched the features, architecture and basis of the domain classes to be designed, a final element necessary to give a budgetary estimate of the project is a list of potential use cases. We will limit ourselves to the use cases where the actor is an external provider. Also, the scope of each use case will be quite large, leading itself to a potentially large number of derived use cases. Following a Semantic Asset lifecycle thread, the following business use cases are deemed necessary to develop an effective pilot XML Clearinghouse (the list is non-exhaustive and complexity is indicated with S=simple, A=Average, C=Complex):

- Register User (or a Community of Interest's Member) - S
- Authenticate User - S
- Edit User details - S
- Enter new Semantic Asset - A
- Register Semantic Asset manually (including structural metadata – internal documentation) - C
- Register Annotation to Semantic Asset (including resource metadata – external documentation) - C
- Generate Asset Identification information (allow unambiguous identification of assets) - A
- Modify Semantic Asset entry (including versioning) - A
- Verify Semantic Asset (before publishing) - A
- Publish Semantic Asset - S
- Subscribe to Semantic Asset - A
- Record Registry Status change (when repository items are modified) - S
- Publish guidelines and reports manually - S
- Browse Classification Schemes (taxonomies, references, etc.) - S
- Check Interoperable Asset Instance (gateway validation) - C
- Search Contents - A
- Synchronize entries (changes to local repositories and/or versions) - A
- Manage metadata slots - S
- Generate packages - S
- Post/Reply to Messages (forum) - S
Figure 4: Class model of ebXML registry

(Source: ebXML / OASIS)
Due to the iterative approach and the nature of the project, adequate support should be provided for change management with a view at collecting as much feedbacks or refinements as possible from end-users. The following diagram emphasizes the "proof of concept" mindset of the project with very important loop back mechanisms ensuring we “get it right”.

![Diagram](image)

**Figure 5: Loop-back mechanisms for POC**

During the testing phase, it is important to have feedback from all the communities involved, including developers who will be mostly interested in the XML Clearinghouse.

On the support and technical side, the scope entails the following items:

- Setting up of Servers
- Setting up Registry
- Setting up Repository…
- Setting up Content Management System – decentralized access
- Setting up Security measures. Data protection
- Technical support and consultancy for partners wanting to connect to the project

Besides building up the infrastructure, operational support and audit will be a key element towards the success of the project. As emphasized above, the feedbacks will be very important to ensure buy-in by the end-users community.

For the project management and software development methodologies, the team would have to comply with the recommendations of the European Commission, especially the architecture framework. Nevertheless, as this project is more akin to a “Content Management” development project, a suggested approach would be to use a RUP-like methodology for the development project overarched by the TEMPO methodology.

Within TEMPO, both the “Small project Lifecycle” and “Operational Services” packages would need to be used, though adapted to the XML Clearinghouse peculiarities such as a potentially high number of stakeholders and involvement of several Member States.

Also, interfaces with other PEGS or PCI project will probably require time and effort, which should also be accounted for in the budgetary estimation.

Last but not least, we would like to suggest a potential CM Project Management approach as depicted in the following diagram:
6.2.5 Communication and Motivation

Apart from the website, which is instrumental for communication, the project has to provide the opportunities for face-to-face encounters and personal exchange, since semantic interoperability is a very complex issue:

- Workshops with interested partners in and outside the Commission - IDABC with organizational support by contractor
- Information Meetings in Member States - IDABC with organizational support by a contractor
- Systematic presentation at conferences - IDABC with organizational support by a contractor

6.2.6 Project Management

A two-year development phase has been recommended for the establishment of the Clearinghouse prototype.

The aim of this transversal work is to ensure timely completion of the project and to meet the project objectives through proper coordination.

The tasks involved include:

- Establish the Project Management and Quality Plan document
- Liaison with EC project officer
- Organization of Project Management Board meetings
- Coordination and monitoring of the technical work done in the various work packages
- Production of meeting minutes
- Production of progress reports
- Production of Final Report
- Organization of special events, project result presentations
- Administering a specific Interest Group under the Commission’s CIRCA tool

The deliverables related to Project Management will be as follows:

1. Project Management and Quality Plan (PMQP) delivered in the first two weeks of the project;
2. Bi-monthly Progress reports that will be sent to a week prior to the progress meetings including when relevant:
   - Other deliverables produced for acceptance
   - Milestones for the next period
   - Any other document relevant to the meeting.

3. Minutes of the Progress meetings a week after the meeting.

4. A set of presentations and promotional material to communicate on the results with the Commission and the Member states, and other stakeholders

5. Publication of the documents

7 Conclusions

The study has shown that creating a pan-European Interoperability Clearinghouse is feasible and can considerably facilitate addressing content interoperability issues in general, and semantic interoperability issues in particular, encountered in future Projects of Common Interest and future pan-European eGovernment Services projects.

The study identifies some conditions for successful deployment and operations. The most notable conditions appear to be:

- Position the Clearinghouse as a lightweight structure aiming at facilitating sharing of information assets, of experience and good practices, in all domains related to content interoperability for pan-European information systems.
- Nomination of a highly motivated Clearing manager, with adequate background and skills.
- Tight cooperation of the Clearinghouse with the Projects developing new PCI and PEGS.

The study recommends to launch the initiative with a two-years project during which actors should be identified and nominated, technical facilities should be set-up, process and quality-plan should be precisely defined and validated, and IDABC should adapt its financial and administrative instruments to be able to support a long-term action.
8 Bibliography

*European Interoperability Framework for Pan-European e-Government Services, V 1.0, November 2004*


*IDABC Working Paper on Content Interoperability strategy, First Draft by Valoris (Sopra group), published in September 2005*

*(ebRIM) OASIS/ebXML Registry Information Model v2.5 - OASIS/ebXML Registry Technical Committee, June 2003*

*(ebRS) OASIS/ebXML Registry Services Specification v2.5 - OASIS/ebXML Registry Technical Committee, June 2003*
http://europa.eu.int/idabc