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IDABC e-Invoicing and e-Ordering project for public procurement

e-Catalogue Feasibility Study

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Authors:	DIGIT/B4, MARKT/C4
	Contributions from Pieter Breyne, Joao Rodrigues Frade, Maarten Daniels, Yvan Van Wynsberghe, Cécile Guasch, Sophie Dangotte, Olivier Rohas, Julia Ferger, Didier Thunus
Approved by:	Angelo Tosetti

Commission européenne, B-1049 Bruxelles / Europese Commissie, B-1049 Brussel - Belgium. Telephone: (32-2) 299 11 11.

Commission européenne, L-2920 Luxembourg. Telephone: (352) 43 01-1.

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Executive Summary

To support the objectives of the i2010 initiative and the e-Procurement Action Plan, the IDABC e-Invoicing and e-Ordering project was started in the summer of 2007 as a joint action of the Directorate-Generals for Internal Market (DG-MARKT) and for Informatics (DIGIT) of the European Commission. This action aims at setting up a public e-Procurement information system in a cross-border environment, between DIGIT and a number of its Suppliers. It contributes to the IDABC objectives by providing a real-life example of a working system that has overcome all the usual elaboration obstacles, and by contributing to the definition of the emerging standards in the e-Procurement area. Furthermore, in addition to the proprietary system developed for the DIGIT infrastructure, an open-source version of this platform will also be made available to the Member States.

The aforementioned project has already produced several deliverables, including a real-life pilot which has demonstrated the use of the developed platform, called e-PRIOR, for the e-Invoicing functionality. e-Ordering functionalities are currently being added into this platform, and this study is the first formal deliverable of the project which will add the e-Catalogue functionalities and the execution of a pilot. The RUP@EC and the CEAF methodological approaches were used to outline both a business and a technical architecture for this pilot.

A critical success factor for the implementation of e-Catalogue lies in its integration within an overall vision for e-Procurement, which should encompass both pre and post-awarding processes. The pre-awarding processes are fundamental for the standardisation of the catalogue format and contents: the origin of the catalogue structure is often the call for tenders, which includes the Customer-centric catalogue template, inherited by the post-awarding catalogue.

The current procurement processes of the European Commission and DIGIT in particular confirm several conclusions of the preliminary study on functional requirements for e-Catalogues in public procurement released by DG-MARKT in the end of 2007. At present, any catalogue specifications used in the EC's public procurement procedures are defined by the EC as contracting authority. These catalogues are already today exchanged in electronic format, typically in non-standardised Excel files. This lack of standardisation undermines the automation of the catalogue creation, exchange, validation and publication processes for both the Customer and the Suppliers. This situation is even worsened by the numerous updates of the catalogues during the life time of the framework contracts.

The proposed to-be scenario aims at increasing the level of maturity of both the Customer and Suppliers with regards to the adoption of standards, taking into account the current state of play. Many common points exist between this study and the report published by the large-scale cross-border e-procurement pilot project, named PEPPOL, in July 2009, which outlined the necessity of a short and long term solution for the exchange of e-Catalogues. Therefore, this study develops a path to standardisation (including compliance with the CPV nomenclature and use of the CEN/ISSS WS/BII profiles), providing enough flexibility to take Suppliers on board which otherwise would not be able to fulfil the requirements. The longer term scenario foresees that the supplier commits to the automation of the full process of exchange of catalogues and their updates via system to system communication.

Optimisation of the Customer catalogue related processes will be performed in order to lower the administrative burden and improve the time-to-contract. The option of a centralized catalogue has been elected, allowing a standardised way of accessing the catalogue data by the customers, of providing catalogue versioning support and query functionalities, and of avoiding the need for the suppliers to provide punch-out facilities.

e-PRIOR has been chosen to convey the catalogues. Its existing services already fulfil requirements such as security, interoperability, traceability, non repudiation and monitoring. Its message life cycle management, validation services and data storage will be adjusted to cater for e-Catalogue functionalities, and the introduction of e-Catalogue on top of e-PRIOR will tighten the links with the e-Ordering and e-Request processes.

1. INTRODUCTION

Public procurement plays an important part in the single market. Consequently, it is governed by rules intended to remove barriers and open up markets in a non-discriminatory and competitive way. According to the i2010 e-Government Action Plan (see [REF 15]), the high-level take-up of public e-Procurement is highly desirable for Europe. Its widespread usage could result in savings in total procurement costs of around 5% and reductions in transaction costs of 10% or more. As a final effect, this could lead to savings of tens of billions of euro annually and easier access to public procurement markets for SMEs. For this reason, this Action Plan points out e-Procurement, and in particular cross-border e-Procurement, as the area on which to focus in the application of key electronic services. The cross-border concern is made clear: e-Government at national level should not create new barriers to the single market due to fragmentation and lack of interoperability. In this context, IDABC was set up by EC's Directorate-General DIGIT as a community-managed programme to fund EU-wide cooperation on e-Government related initiatives.

In particular, IDABC contributes to implementing the i2010 e-Government Action Plan and the EU e-Procurement Action Plan (see [REF 19]). IDABC activities are not limited to producing guidelines; they also entail implementing infrastructures which enable interoperability. To support these objectives, the e-Invoicing and e-Ordering project was started in the summer of 2007 as a joint IDABC action of DG-MARKT and DIGIT. A main objective of this IDABC action was to set up e-Invoicing and e-Ordering functionalities as part of a Public e-Procurement Information System, in a cross-border environment, between DIGIT and a number of its Suppliers. This action aimed at the practical implementation of IDABC's guidelines for the provision of interoperable e-Services at a pan-European level. In 2008, the scope was extended to include a proof of concept pilot on e-Catalogues as well, in support of the system's procurement and ordering functionalities.

At the moment of writing this study (hereinafter referred to as 'the Study'), a number of deliverables, including the real-life pilot of the e-Invoicing module, have already been presented to IDABC. e-PRIOR (see [REF 16]) is the acronym of the service-oriented platform currently being developed by DIGIT. This hub system aims at simplifying the exchange of documents between the Customer and its Suppliers. Conceptually, e-PRIOR acts like a mailman so that the documents which are today conveyed on paper, via the postal service or fax (e.g. invoices, catalogues, orders, etc), can in the future be submitted in a standard electronic format via a secure communication channel. When electronic services are exposed by an organisation, in this case by the Customer, its use by another organisation, in this case by the Supplier, may result in low interoperability given that the legacy e-Procurement systems are often designed and optimised for the internal requirements of the organisation. In order to avoid this, e-PRIOR promotes loose coupling and interoperability by exposing electronic services. These web services use open standard message formats and open standard message definitions. As an example, the several services related to e-Invoicing, available via e-PRIOR, enable the Suppliers of DIGIT to send Invoice, Credit-Note and Attached Document messages using an open standard format with standardised message contents (see [REF 7]). The documents received from the Supplier are routed by e-PRIOR to the appropriate e-Procurement system of the Customer. The Customer may also submit documents to the Supplier via e-PRIOR's Inbox service.

The Study is the first formal deliverable of the e-Catalogue project part of the aforementioned IDABC action. In line with the e-Invoicing component of this action, this project aims at a practical and significant contribution to the objectives set by IDABC within the domain of e-Procurement.

e-Catalogues are electronic documents created by the Supplier that can serve to automate the submission of offers and orders in a public procurement process. In particular, e-Catalogues are expected to be useful in repetitive purchasing procedures, where the same data (administrative or item-related) may be exchanged and re-used many times.

It should be noted that at the EC, catalogues, unlike e.g. invoices, are (when used) often exchanged in electronic format, typically in Excel files, following the (pre)awarding phase of the procurement process. However, their format and content is not standardised nor the communication channel secured. Normally, the exchange happens via e-mail. This lack of standardisation is a potential cause of the various manual intensive processes linked to the creation of catalogues by Suppliers and afterwards their upload and use by the Customer.

The Study is the first step in the preparation of a pilot between DIGIT and a number of its Suppliers (hereinafter referred to as 'the Pilot') to exchange catalogues in electronic format with standard format and content. With this primary goal in mind, the Study re-uses the results of the report on preliminary functional requirements for electronic catalogues in electronic public procurement released by DG-MARKT in the end of 2007 (see [REF 1] through [REF 4]). Taking the results of the 2007 preparatory study as a starting point, the Study addresses the same theme, e-Catalogue, from a more practical perspective, forming a concrete action in response to the main findings of these reports (i.e. the need to standardise the use of e-Catalogues, the need to standardise product and service descriptions within the e-Catalogues and the need to enhance existing systems towards using e-Catalogues).

From a strategic point of view, this e-Catalogue initiative aims at close cooperation with the ongoing PEPPOL pilot project and the ongoing CEN/ISSS WS/BII standardisation workshop, both co-sponsored by the Commission. Although at different levels, from conception, all these initiatives aim at contributing and facilitating European-wide interoperable public e-Procurement through standardisation.

The table below provides an overview of the alignment between this initiative and IDABC's e-Procurement objectives.

IDABC e-Procurement objective	Current context	Contribution to the objective
Implement the 2004 EU Action Plan for e-procurement	The Action Plan seeks to support Member States in transposing and implementing the new legal framework for e-procurement, set by the 2004 EU Public Procurement directives, in a timely, correct and coherent way. In particular, the Action Plan is geared towards 3 goals: - Create well-functioning cross-border e-procurement in the Internal Market; - Improve competitiveness, efficiency and good governance in national public procurement markets in the EU; - Work towards an international framework for e-procurement.	Following the conclusions of the Study, DIGIT will pilot the exchange and use of e-Catalogue with a number of its Suppliers. This will contribute to the implementation of the Action Plan's recommendations on the use of e-Catalogue, one of the most innovative features of the EU directives.

Achieving interoperability	Increasing demand for practical cases of interoperable services between Public Institutions and their external environment.[1]	As mentioned above, a pilot of e-Catalogue will be set up by DIGIT. Given the federated organisational and IT environment of the European Commission, the Study is carried-out in collaboration with several other Directorates Generals and analyses the federated use of e-Catalogue.
		NOTE The aforementioned Pilot may involve other Directorates Generals of the EC and other Institutions of the EU.
Facilitating electronic Public Procurement (e.g. by providing functional requirements, tools or generic services)	Public Institutions throughout Europe, more and more, strive to implement e-Procurement services based on requirements and open standards which go beyond their borders (e.g. CEN/ISSS BII/WS is, at the moment this document is written, active in creating common e-Procurement specifications).	The Study includes detailed descriptions of straightforward 'as is' models and 'to be' scenarios of how catalogues are submitted, validated and used. It is produced by members of the CEN/ISSS BII/WS.
Promoting the use of e-Procurement in Europe	The PEPPOL project is aiming to set up integrated pilot solutions across borders to disseminate e-Procurement.	This project aims at supporting the EC's strategy of promoting e-Procurement. The Study aims at re-using the work of PEPPOL's WP3 (electronic catalogues). Specific references are included throughout the Study.

Table 1 Alignment between the Study and IDABC's e-Procurement objectives

WRAP UP The current lack of standardisation of format and content of the e-Catalogues is a potential cause of the various manual intensive processes, from the creation of the catalogue by the Supplier to its upload and use by the Customer. As a consequence, this project will cooperate with the ongoing European-wide initiatives to support the further development of open standards for e-Catalogues.

1.1. Purpose

The purpose of the e-Catalogue project is to provide the IDABC programme with a practical pilot for the use of e-Catalogues, in a cross-border environment, by a large public sector institution (i.e. EC, DIGIT).

This experiment will evaluate if a higher degree of standardisation of the business processes, information contents and message formats linked to e-Catalogue is likely to improve operational efficiency for Suppliers and Customers.

[1] Launched in June 2007, the ePractice.eu portal is a knowledge base of good practise and real-life cases. A specific e-Procurement Forum collects the case studies on this domain:

http://www.epractice.eu/community/eprocurement

Nevertheless, a preliminary study is required to determine whether and how the Pilot can be successfully carried out. Therefore, the purpose of the Study is to assess:

- The feasibility to use open standards for the format and contents of e-Catalogues;
- The feasibility of streamlining the exchange of e-Catalogues;
- The impact of this e-Catalogue project in the current business processes, mostly linked to purchasing, of the EC and DIGIT in particular.

As a result, the Study will determine the impact of such potential changes at several levels of this organisational structure (e.g. business processes, applications, infrastructure, etc). Ultimately the Study will put forward the roadmap of the e-Catalogue Pilot.

WRAP UP The e-Catalogues project aims at realising an e-Catalogue Pilot which promotes standardised business processes, information contents and message formats in line with European wide initiatives such as the CEN/ISSS WS/BII and PEPPOL and using open standards. By doing this, it embraces the goal of a better, simplified and more secure public procurement and alignment with the PEPPOL project.

1.2. Audience

The target audience of this document includes both business and technical experts in the e-Procurement domain. Everyone interested in effective design and implementation of e-Catalogue may be interested in reading the Study. More in particular, the Study is written for:

- All parties involved in the initiation and undertaking of IDABC's e-Invoicing and e-Ordering project for public procurement. This includes members of DG MARKT, DIGIT, IDABC's PEGSCO and contractors.
- Member-States and the PEPPOL consortium;
- All internal and external stakeholders who contributed to the making of the Study.

1.3. Scope

Typically, a catalogue, in electronic or paper format, is a document created by the Supplier to describe its products and/or services, their price and, potentially, additional information to facilitate the ordering process.

According to the European public procurement directives, e-Catalogues may, under certain conditions, constitute a tender in a public procurement procedure. Once the (pre)awarding process is concluded, the e-Catalogue is used to facilitate the post-awarding processes, in particular e-Ordering. This e-Catalogue is a living document which is subject to controlled updates according to the contractual agreement between the Customer and the Supplier.

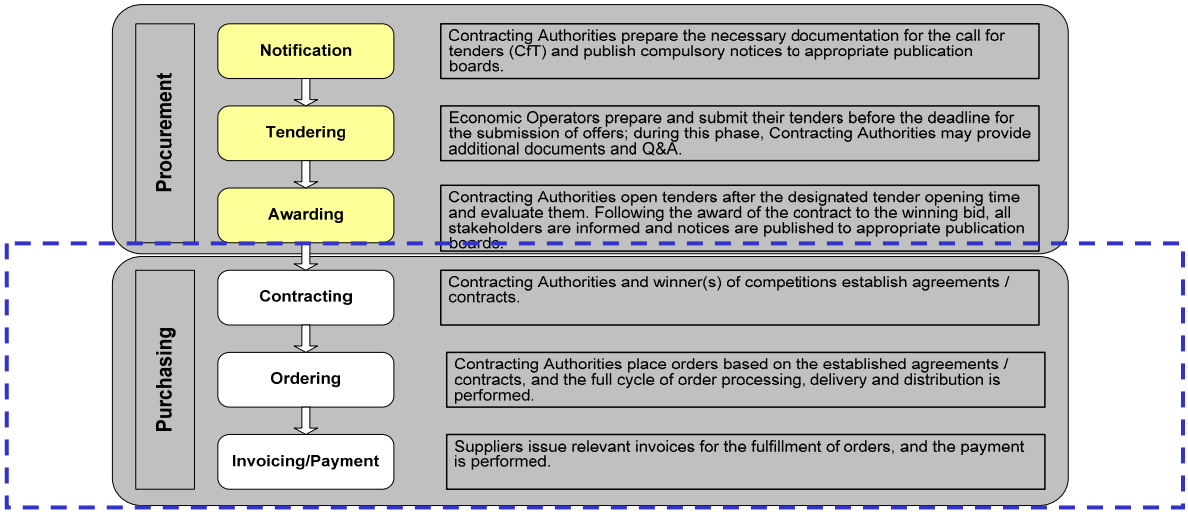

Figure 1 Main phases of public procurement procedures according to [REF 1].

The e-Catalogue is normally uploaded into the purchasing system of the Customer which facilitates its consultation and use to start the ordering process, usually via a requisition process. Another widespread scenario is the integration of the Customer's system with the Supplier's system hosting the e-Catalogue. In this case, the e-Catalogue may not be uploaded in the purchasing system of the Customer, instead the Customer 'punches out' from its system to use the e-Catalogue located in the Supplier system.

Additionally the catalogue may be created according to the buyer specifications (hereinafter referred to as a Customer-centric catalogue) or according to the supplier specifications (hereinafter referred to as a Supplier-centric catalogue).

Having all the above in mind, several meetings were held by the project team to define the appropriate breath and depth of the Pilot and consequently the one of the Study. The following table provides the reader with the debated topics and decisions taken on the scope:

Question?	Answer
Should the Pilot cover both the pre-awarding and post-awarding phases of public procurement?	The ultimate goal of the e-Catalogue project is the piloting of standardised e-Catalogues with the Suppliers of DIGIT. It was agreed that, in this context, it makes more sense to depart from existing catalogues and run the Pilot with Suppliers already having a contractual relationship with DIGIT and an agreed product and/or service catalogue[2]. Hence, the Study only covers the use of e-Catalogue in post-awarding phases of public procurement: • The exchange of e-Catalogues, being a full catalogue, in relation to its creation in the back-office of DIGIT. This happens once the tendering process is concluded. • The exchange of e-Catalogues, being a full catalogue or part of it, in relation to updates (e.g. revision of prices or item related updates, etc).

[2] DIGIT has several current framework contracts concerning computers or IT goods or services (hardware, software and related services, including telecommunications). For further information, see http://ec.europa.eu/dgs/informatics/tenders/index_en.htm

Question?	Answer
	• The use of e-Catalogues to initiate the ordering process. As a general rule, the information in the catalogue is used to fill-out a requisition form.
Regarding the kind of contracts to be covered, should the Pilot cover direct contracts, framework contracts and Dynamic Purchasing Systems (DPS)?	Direct contracts, often, do not require the creation of a well defined catalogue of products and/or services. In this type of contracts, the product and/or service, the volume and timing of delivery are already defined and are usually definitive and self-sufficient. Regarding repetitive purchases which involve multiple steps to define the actual purchase: • At present, DPS is not used by DIGIT; • Framework contracts are commonly used to set out the contractual performance framework (in general, the characteristics and price of the products and/or services which the Supplier will provide). The Study focuses on catalogues related to framework contracts. At present, the catalogue specifications used in the EC's public procurement procedures related to framework contracts are by large Customer-centric. Currently, the format and content of these catalogues are optimised for the purpose of the particular call for tenders. Thus, their specification is, as a general rule, bespoke. This means, that e-Catalogue standards, related to format or content, are also not used. As a result, there is a need of a standardised approach for the format and content of the Customer-centric catalogue.
Should the Pilot cover the 'Punch-Out' mechanism?	The 'Punch-Out' mechanism is offered by a limited number of large Suppliers. Each Punch-Out mechanism makes available its particular interface to the Customer. Since all EC procurement must comply with the principles of transparency, proportionality, equal treatment and non-discrimination, it is clear that this mechanism should be part of the Pilot only in such a way that those requirements are respected.
Should the Pilot cover the case of multiple framework contracts with reopening of competition?	At present, DIGIT is not using the mechanism of multiple framework contracts with reopening of competition. Therefore, this situation will not be directly covered by the Study.

Table 2 Scoping Questions and Answers

Following the decisions detailed above, the following table provides a short summary of the scope of the Study and of the e-Catalogue Pilot.

Topic	Within the study's scope?
Use of e-Catalogue in Pre-Awarding processes. ***NOTE*** In 2010, in addition to the Study, a Gap analysis between pre- and post-awarding business requirements for e-Catalogues will also be produced by this project. For additional information	**No**

please see section 6.4.	
Use of e-Catalogue in Post-Awarding processes (creation and update of e-Catalogue). ***NOTE*** This also entails the study of standard classification schemes and the relationships with the pre-awarding processes which originated the framework contract specifications.	**Yes**
Use of e-Catalogue in the context of direct contracts.	**No**
Use of e-Catalogue in the context of DPS.	**No**
Use of e-Catalogue in the context of framework contracts concluded between one or more contracting authorities and one or more economic operators.	**Yes**
NOTE The reader should be aware that: - The specific case of multiple framework contracts with reopening of competition is currently not used by DIGIT and therefore not covered; - The case of supply channel within a framework contract is also covered by the Study. Generally, an offering process applies to the items which are managed in the supply channel mode. This process allows the Institution to acquire (in a controlled way) products which do not appear in the supply channel list or to request the replacement of existing products. However, the details of this process are not provided in the Study since this is part of [REF 17].	
Provision of a punch-out mechanism controlled by the Supplier.	**No**
Use of e-Catalogue in the context of the ordering process.	**Yes**

Table 3 Scoping table

WRAP UP The Study will look into the creation, update and use of e-Catalogues in post-awarding processes linked to the execution of framework contracts. DIGIT has several framework contracts which cover computers, IT goods and IT services (hardware, software and related services, including telecommunications).

2. APPROACH

2.1. Methodological Approach

This project follows the guiding principles of the Rational Unified Process at the European Commission (a.k.a. RUP@EC) complemented by the guidelines of the Commission Enterprise Architecture Framework (a.k.a. CEAF) and IDABC's European Interoperability Framework.

The RUP@EC method promotes an iterative Use-Case driven approach to software development. This framework, in addition to best practises and architectural standards, defines the full software engineering process including its disciplines, workflows, roles, activities and artefacts. This document is an assembly of chapters from standard RUP document templates: the Vision document, Business Architecture Document and System Architecture Document.

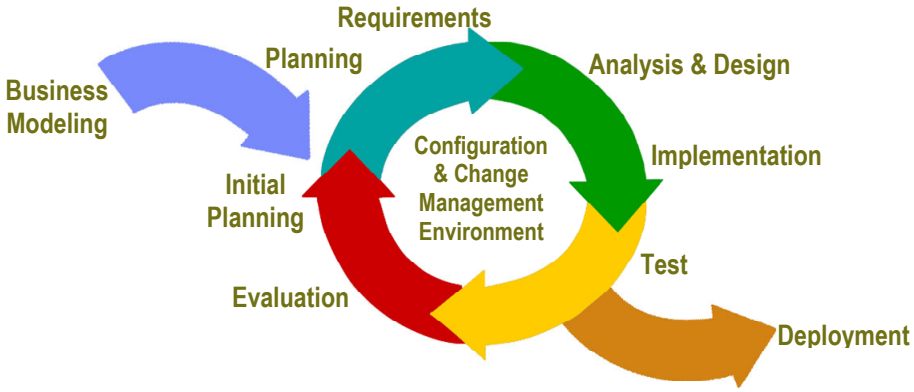

Figure 2 The disciplines part of RUP@EC

In addition, the CEAF methodology promotes the Business-to-IT alignment in the context of change. In this specific case, the automation of paper-based processes (e.g. exchange of paper catalogues or manual approval and loading of catalogue data). These assembled guiding principle are used in the analysis of the impacts, at all levels of the organisation, caused by the transition process of the current state (a.k.a. 'as is') to the future state (a.k.a. 'to be').

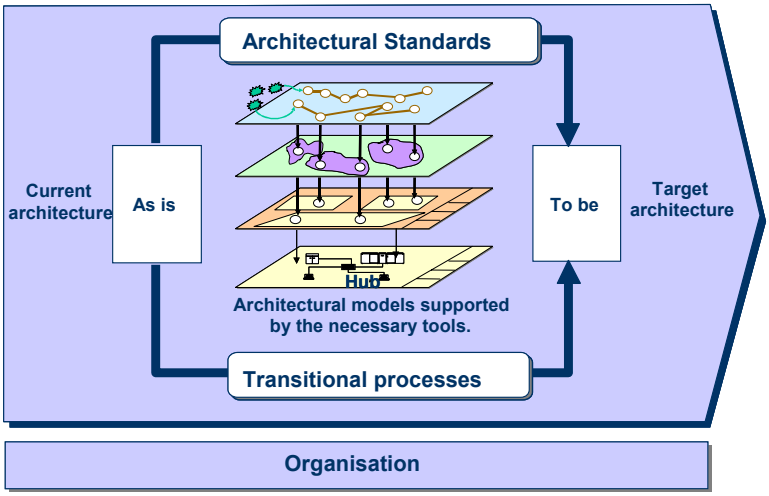

Figure 3 Overview of the CEAF methodology

In line with these principles, the work performed during the Study started from the analysis of the business needs expressed by different stakeholders to make sure that IT automates the relevant activities in an aligned way. The following steps were performed:

(Step 1) Model the business;

(Step 2) Gather the requirements;

(Step 3) Detail the requirements and constraints;

(Step 4) Describe the overall e-Catalogue technical architecture and data elements.

The reader should note that these steps were not carried out sequentially. Since they complement each other the listed steps were completed, more or less, simultaneously following an iterative approach. The final goal being that the requirements, architecture and plans are stable enough, and the risks sufficiently mitigated to be able to run the Pilot.

2.1.1. (Step 1) Model the Business

When analysing the feasibility of a system, it is essential to understand the business purpose it serves. In particular when the business needs related to e-Catalogue vary across Directorate Generals and the business units of the EC. The business modelling exercise serves to provide adequate information about the organisational synergies and autonomy requirements regarding the e-Catalogue related business processes. To explore process automation, the relevant stakeholders are identified and the current relevant business processes are described (i.e. as is business models). Following these steps, the changes to the business processes are identified (i.e. to be business models). By combining discussion of technical solutions with business process design, the significance of making an e-Catalogue Pilot becomes better understood by the several stakeholders.

2.1.2. (Step 2) Gather the Requirements

After identifying the key stakeholders of the project, the team delivering the Study collected, analysed and defined the business needs, and features linked to the use of e-Catalogue. Therefore, this step focused on understanding the capabilities required by the stakeholders, including its target users, and the risks which could decrease the likelihood that the e-Catalogue Pilot is delivered. Aiming at a holistic view of the potential implications of the e-Catalogue Pilot the following categories of stakeholders were interviewed:

- Internal Stakeholders:
    - Departments of DIGIT;
    - Other Directorate Generals of the European Commission;
    - Organisational roles of the European Commission.
- External Stakeholders:
    - Suppliers of DIGIT (Hardware, Software, Simple Services);
    - Member States using the result of PEPPOL's questionnaire.

The interview process influenced the other steps in the process of analysing the feasibility of the Pilot. Following each interview, a summary report was distributed to all participants and the outcomes formally approved.

Since a significant number of countries had answered to the questionnaire performed by PEPPOL WP3, the team conducting the Study decided to not carry out a similar questionnaire. The results of this questionnaire were published by PEPPOL in its report released in July 2009 (see [REF 5]).

In the Study, the e-Catalogue subject is analysed using a multi-dimensional approach according to the guidelines of IDABC's Interoperability Framework which is depicted in the figure below.

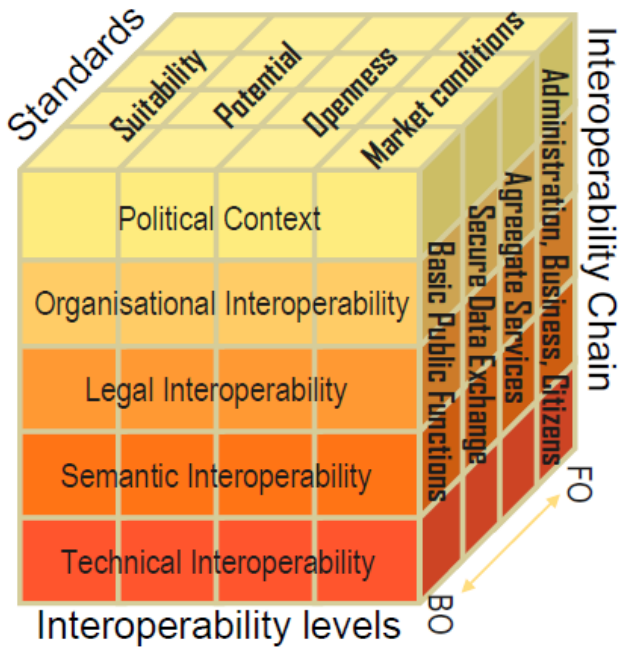

Figure 4 IDABC's Interoperability Framework 2.0

For both domains, interviews and desk research were made to identify:

- In which extent the stakeholders use catalogues and, in particular, e-Catalogues or their expectations on the transition to an e-Catalogue;
- The current challenges regarding the standardisation of e-Catalogue related processes;
- The current challenges regarding the standardisation of the content of these (e-)Catalogues;
- Requirements and constraints at several levels to enable future interoperability;
- The functional features of systems performing the exchange and/ or use of such e-Catalogues;
- The list of the IT systems currently used to create, maintain and use the e-Catalogue.

In this process the collected data was validated to ensure that:

- The evidence collected is complete, objective and it covers the scope and purpose of the Study;
- The coherence and consistency of the analysis as a whole.

2.1.3. (Step 3) Detail the Business Requirements and Constraints

At this step, the several stakeholder requests, collected at the requirements gathering step, were analyzed, and consolidated into a number of Business Needs. Each Business Need is linked to one or more Stakeholder. Afterwards, the capabilities or characteristics that directly fulfil these Business Needs were described in system Features. These Features were then used to structure the e-Catalogue use-case model.

2.1.4. (Step 4) Describe the Overall e-Catalogue Technical Architecture and Data Elements

This step is about defining the candidate system architecture which will support the e-Catalogue related business processes, at different levels, during the Pilot exercise. This included the review of existing Procurement systems and the design of a viable Proof-of-Concept Architecture.

Regarding product and service classification schemes the following process was used to analyse the feasibility of using CPV as the canonical product and service classification scheme:

- The catalogues of several running framework contracts were mapped against CPV.
- Mapping issues were analysed and described, possible solutions were also identified.
- Additionally, a comparison between CPV and eCl@ss was undertaken to validate the possibility of using eCl@ss attributes as an extension to the CPV main vocabulary.

2.2. Adoption and Promotion of Standards

This chapter will be looking at standardisation from the perspective of the Pilot preparation. Regarding the state of the art, several reports are available summarising the standardisation initiatives around e-Catalogue. Therefore, the reader should refer to this material for knowing more about this topic. Please refer to chapter 9 References, in particular [REF 3] and [REF 5]. The goal of this chapter is simply to explain the importance of standardisation and the challenges originated by it for the e-Catalogue Pilot.

The standardisation of the use of e-Catalogues relates to two main areas: the standardisation of processes (including messages) and the standardisation of content. In 2007, the Executive Summary [REF 4] of the reports on Electronic Catalogues in Electronic Public Procurement, released by DG-MARKT, identified a significant interoperability gap in the use of e-Catalogue.

"The current use of eCatalogues in public procurement demonstrates significant interoperability limitations, reducing the possibilities for efficiency-gains through their automated processing and re-usability. In this respect, all stakeholders are recommended to work towards standardising the use of e-Catalogues in the context of public procurement, both for the pre- and post-award phases."

One main cause for the identified gap was the fragmentation of standards. Numerous initiatives had been working on the standardisation of the format (and content) of e-Catalogues. However, the final result was a hand-full of industry-specific standards, which were not interoperable.

At the time, the report suggested that the e-Catalogue standard of OASIS, UBL 2.0, and the CEN/ISSS initiative, c-Catalogue, were the most promising standards[3] but that they should converge. Below is the text from aforementioned report released by DG-MARKT:

"This has been recognised by the relevant standardisation bodies, which are currently working towards the convergence of UBL and c-Catalogue, with an objective to define the specifications for one unique standard. (...) The standardisation of content is as equally important as the standardisation of processes/messages, in order to establish a common base for the automated processing of eCatalogues based on uniform eCatalogue content."

Additionally, the report indicated that not only the format but also the data content should be defined in a common way. Only then the e-Catalogue would be processed automatically without difficulty. However, also in this case another gap existed caused by competing approaches to describe and classify products and/or services. Below is the text from aforementioned report released by DG-MARKT:

"The best approach for standardising the former type of content is to utilise product description and classification schemes, which can form the backbone of eCatalogues, allowing the succinct, standardised description of offered products/services. There are currently several such schemes, which again generate a new standardisation gap. Hence, effort should be dedicated in resolving this gap and establishing a suitable framework for the standardised description of products/services within eCatalogues."

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[3] The c-Catalogue is not yet an official standard, and is currently under further development by UN/CEFACT. The c-Catalogue was initially developed by CEN/ISSS and is currently under development by UN/CEFACT.

The report then concludes that the standardisation of e-Catalogues in public procurement relates to the standardisation of six conceptual levels:

"In short, it is identified that the standardisation of the use of eCatalogues in public procurement relates to the standardisation of six conceptual levels for achieving eBusiness through the use of eCatalogues. The bottom three levels (Levels 1, 2 and 3 of the figure) relate to the standardisation of product description and classification schemes, which can accommodate the standardisation needs for product/service descriptions contained in eCatalogues. The top two levels (Level 5 and 6 of the figure) relate to the standardisation of processes and messages making use of eCatalogues for achieving eBusiness. These two levels can be addressed by the use of UBL and c-Catalogue (or the anticipated unified standard). Level 4 of the figure relates to the creation of eCatalogues (format, presentation, and content), which requires both the use of product description and classification schemes for standardising product descriptions and the use of eCatalogues standards such as UBL and c-Catalogue for standardising eCatalogue content not related to product/service descriptions."

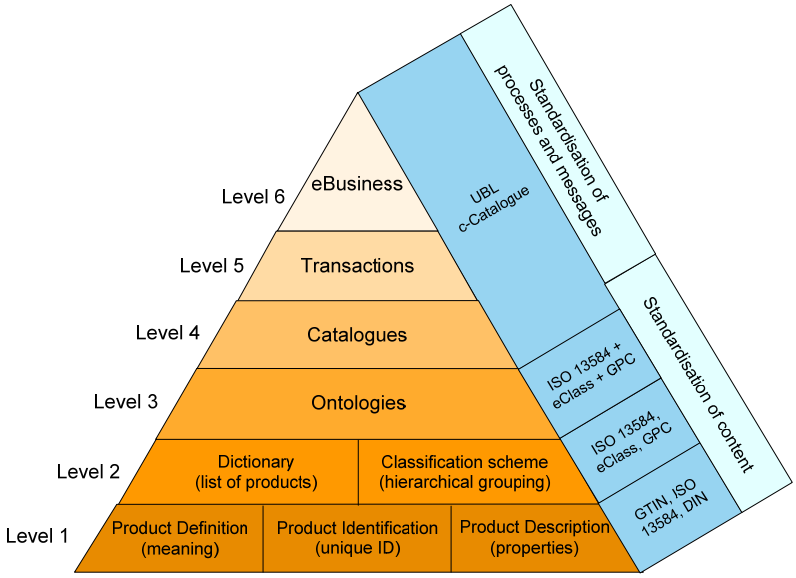

Figure 5 Six conceptual levels for the standardisation of e-Catalogues

At the time this document is written, the abovementioned gaps continue to be the main obstacles for the widespread use of e-Catalogue. In 2009, the PEPPOL project is working with two initiatives of CEN/ISSS, among other initiatives, to determine a practical answer for these gaps:

- CEN/ISSS WS/eCAT was launched in 2002 as a joint initiative of Infoterm and TermNet to address issues related to the use of electronic catalogues used for eBusiness in a multilingual environment. Its scope was extended since, to include harmonization of product and service classification schemes and their application to electronic catalogues. Since its establishment, several projects were launched under the Workshop umbrella, dealing with e-Catalogue related issues, ranging from multilingual e-Catalogues to product and/or service description and classification;
- CEN/ISSS WS/BII was launched in 2007 to provide a basic framework for technical interoperability in pan-European electronic transactions, expressed as a set of technical specifications that cross-refer to relevant activities, and in particular are compatible with UN/CEFACT in order to ensure global interoperability. The Work Package 3 (WP3) of PEPPOL agreed on using the following CEN WS/BII Profiles:
  - BII 01 'Catalogue Only' to set up a catalogue;
  - BII02 'Catalogue Update' to maintain a catalogue;

- BII017 ‘Multi-party Catalogue’.

PEPPOL considers that CEN/ISSS WS/BII is suitable to be adopted as open standard to be used in a pilot project.

From a strategic point of view, our initiative aims at close cooperation with the ongoing PEPPOL project and the ongoing CEN/ISSS WS/BII. Therefore, the preferred solution regarding the standardisation of processes (including messages) and the standardisation of content is the reuse of the strategies outlined by PEPPOL WP3. We contributed by doing a formal study of the feasibility of using CPV as a standard classification scheme. Please consult chapter 5, section 5.4.3 for further details.

2.3. Synergies and Complementarities with the PEPPOL Project

During the execution of the Study, input from the PEPPOL project was taken into account, mostly based on the PEPPOL WP3 report released in July 2009 [REF 5] and an interview with the PEPPOL WP3 leader.

The PEPPOL large scale pilot project is co-funded by the EU[4] as an ICT Policy Support Programme under the CIP. Its objective is to set up a pan-European pilot solution that, together with existing national solutions, facilitates EU-wide interoperable public e-Procurement.

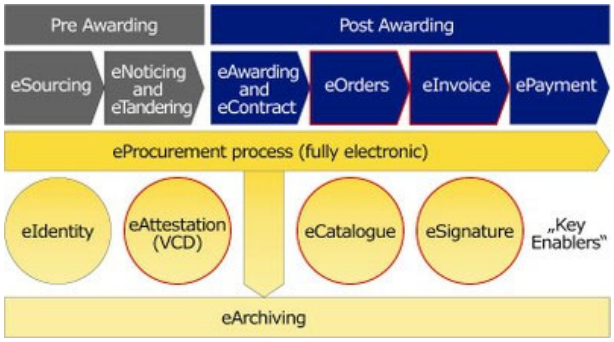

Figure 6 Phases and components of the PEPPOL project

The final outcome of PEPPOL will be an interoperational environment built on national systems and infrastructures supporting the full cycle of e-Procurement activities. Work package 3 (WP3) is focused on e-Catalogues. WP3 will develop guidelines, specifications and pilot solutions to overcome the lack of interoperability between the different national schemes for the use of e-catalogues.

[4] PEPPOL (www.peppol.eu) was started by DG INFSO in May 2008, in support of the Commission's i2010 eGovernment Action Plan (2006) and e-procurement Action Plan (2004). The project involves approx. 2/3 of Member States and EEA countries; this year its budget will reach a total of almost 30 Million EUR (13,5 million EUR of which co-funded by the EU under the 'Competitiveness and Innovation' Programme – 'CIP'). The private-public project consortium is led by the Norwegian Ministry for Administrative Reform.

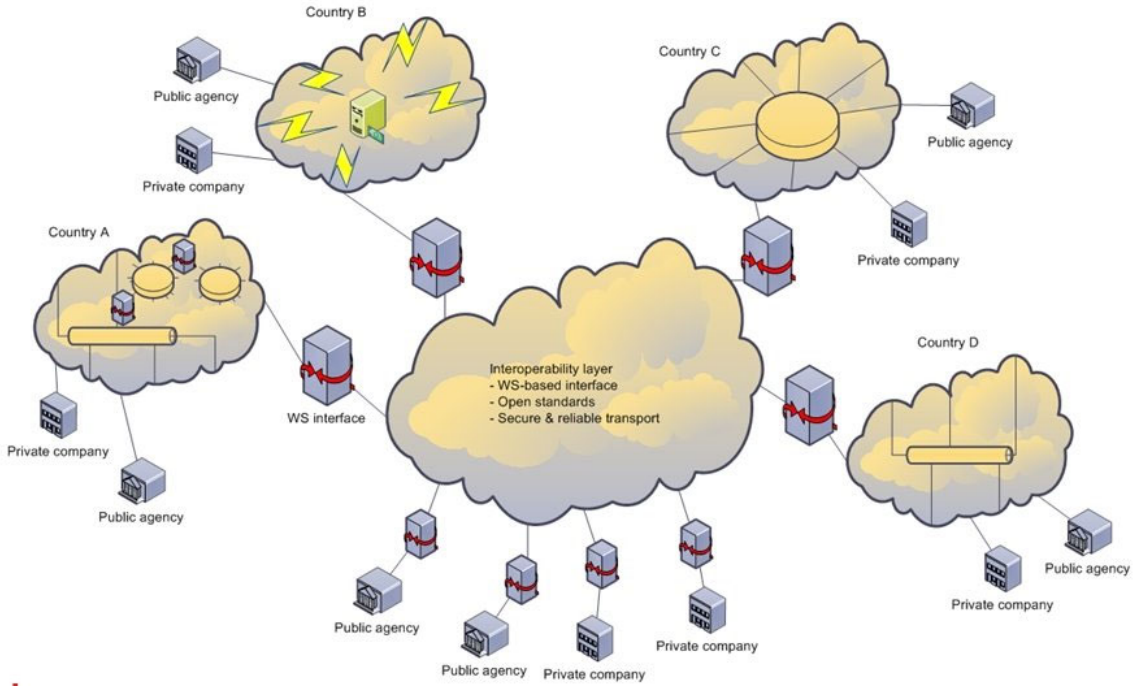

Figure 7 The PEPPOL infrastructure

This sharing of information confirmed a number of important similar strategic choices and identified some similar challenges:

- Ideally, a fully automated and integrated e-Catalogue exchange would be the ideal solution, but seems only viable on the long term, when looking at the as-is business and systems architecture. A more simple solution might be needed on the short term. Therefore, this study develops a path to standardisation (including compliance with the CPV nomenclature and usage of the CEN/ISSS WS/BII), providing enough flexibility to take Suppliers on board which otherwise would not be able to fulfil the requirements. The longer term scenario foresees that the supplier commits to the automation of the full process of exchange of catalogues and their updates via system to system communication;
- The selection of an e-Catalogue format, based on the core CEN/BII standard catalogue format;
- The support of one or more product and/or service classification systems: CPV, eCl@ss, GPC, UNSPSC, GMDN or other. In this context the reader may have a look at chapter 5, section 5.4.3 for further details.

Further synergies might be envisaged regarding e-Catalogue tools.

By developing Open e-PRIOR, the open-source version of e-PRIOR, the IDABC e-Invoicing and e-Ordering project team will complement the infrastructure and tools that are provided by PEPPOL (for more information on tools the reader should consult section 5.2). Members States will be able to use Open e-PRIOR for exchanging e-Invoices, e-Orders and e-Catalogues, directly with their domestic suppliers or via the PEPPOL Connector with their foreign suppliers that are already connected to the PEPPOL infrastructure. Open e-PRIOR will allow the public administrations to integrate with their back-office system(s).

NOTE The development of Open e-PRIOR with e-Invoicing functionality has already started ('Basic Invoice' and 'Invoice with Dispute'), whilst at the moment of writing the Study, approval from IDABC is still needed to add e-Ordering and e-Catalogue functionality.

3. BUSINESS ARCHITECTURE

3.1. Introduction

3.1.1. Purchasing Process Overview

The figure below illustrates how the catalogue typically supports the entire purchasing process, from the requisition (step 1) to the specific contract or Order From (step 3).

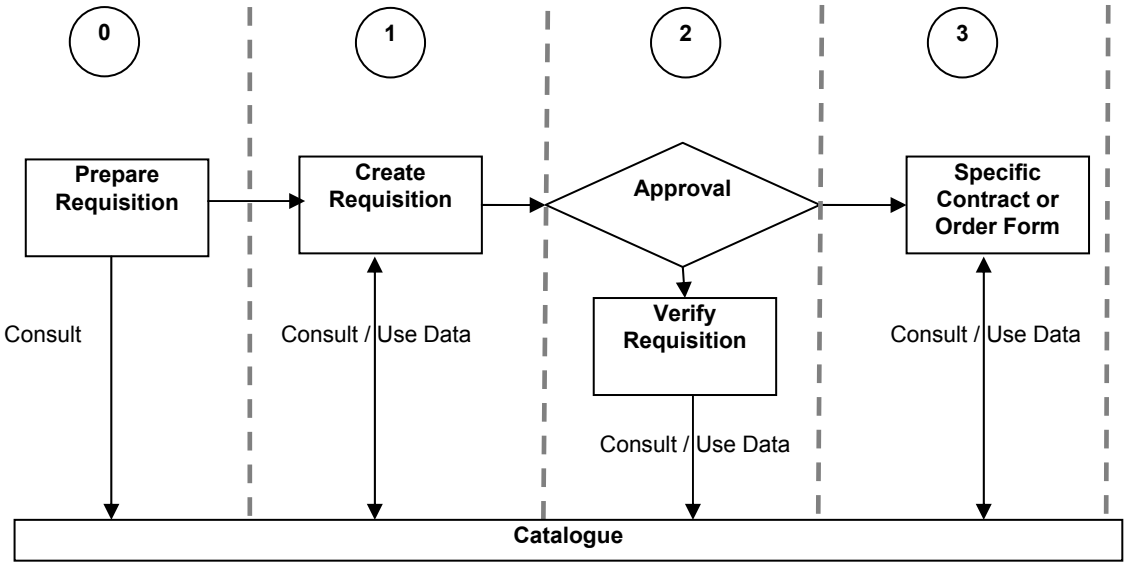

Figure 7 High-level purchasing process

Any errors, omissions or delays in the earlier parts of the process may cause significant disruptions in its later stages. These problems and anomalies are usually costly and impact the business in a negative way. The use of accurate data is crucial for efficient purchasing. For this same reason, the less information is manually entered the better. The use of e-Catalogues is a common tool to achieve these objectives and reduce the cycle time interval of the end-to-end process. Good quality and up-to-date catalogues enable the selection of products and/or services according to the business needs and thereafter the creation of an error-free requisition. This also means its faster approval which is translated in the creation of a specific contract or order form which correctly specifies the product and/or service, orderable quantities, pricing, etc. Thereafter, the fulfilment and billing processes also benefit from the use of accurate data in the ordering process. This means that the entire 'purchase-to-pay' cycle may benefit from the use of the e-Catalogues.

3.1.1.1. Purchasing Process Typical Pain Points

The table below provides an overview (which does not aim at being complete) about typical pain points within the several aspects of a generic purchasing process.

	Organisation	Processes	Systems
Time	• Incomplete requisitions; • Per purchasing area different response time.	• Improper settlement of responsibilities and (authorisation-) competencies.	• "Idle period" through manual processing steps; on/off system support.
Quality	• Deficient supply chain management; • Lack of information exchange between purchasing areas.	• No "Fit-to-Organisation" standard processes; • No standard data models • Different variants of purchasing processes.	• Scattered data and lack of traceability between steps; • Heterogeneous data structures.
Cost	• Personnel intensive processing steps; • Overlapping reach of competencies of purchasing areas.	• (Manual) Correction of un-coordinated process steps; • Long purchasing cycles with many steps.	• High maintenance efforts for different system solutions and individual software.

Table 4 Typical pain points within the several aspects of the purchasing process

3.1.1.2. Catalogue Implementation Patterns

The use of e-Catalogue is not new. They are already in use both in the private and public sector. Currently there are three common methods used by Customers to obtain information from the catalogue of a Supplier. Each of these methods is linked to particular characteristics of the context of use. The table below provides a view on these three common implementation patterns of e-Catalogue:

Context of Use	Common Implementation Pattern
• Products and/or services, and prices are agreed and regulated by a long-term contractual relationship between the Customer and the Supplier. The precise volume and timing of delivery may not be defined at the outset, the volume and other specific conditions may be agreed in 'specific contracts' or 'order forms.' • Purchases are made frequently and potentially in large or in regular quantities.	**Customer-centric catalogue** In this approach, Suppliers prepare the catalogue in electronic format, following the formalisation of the contractual relationship, according to the specifications of the buyer. Usually, the Customer-centric catalogue is a subset of the Supplier's catalogue. This catalogue only contains the products and/or services which the Customer is interested-in. Changes (update, adding and deletion of products and/or services) may happen in a controlled manner.
• Purchases are time-critical. • Purchases are one-off. • Product and/or services specifications are subject to high variety and/or constant change. • Contractual relationship may or may not exist.	**Supplier-centric online catalogue** In this approach the Customer uses the online catalogue of the Supplier. In this case, the creation of a subset of the Supplier catalogue is usually not feasibility or interesting for the Customer. Therefore the full catalogue of the Supplier is used

Any of the above	**Customer punch-out (from the Supplier's online catalogue)** In this approach the Customer leaves (i.e. 'punches out' from) their company's system and navigates to the Supplier's online catalogue to select and create a basket of products and/or services. This basket is then imported to the Customer's system. Suppliers are sometimes able to create in their system a catalogue which is specific to the Customer (i.e. a subset of its products and/or services, its prices, etc).

Table 5 Common patterns of e-Catalogue implementation

NOTE Not all three generic implementation patterns are equally well suited to use in public procurement. The first and third patterns would, provided that certain conditions are met, seem more appropriate than the second one. For additional information on these specific constraints, please see [REF 1] up to [REF 4].

3.1.1.3. Business Goals of the Customer

The table below provides information on the most common business goals linked to the implementation of e-Catalogues by Customers. For each business goal sources of risk are also identified. For each business goal, sources of risk are also identified. These sources of risk are not just technical, but can also be organisational or related to the business process. The identification of risk sources provides a broader view on the challenges linked to the implementation of an e-Catalogue system. This summary table is based on the several reference documents used in the writing of the Study.

Customer Side			
Business Goals		**Potential Risks**	
Goal 1.	**Reduction of order-processing costs and cycle times through more accurate and uniform catalogues.** The electronic exchange of catalogues enables their automatic (or semi-automatic) uploading into the back-office of the Customer. This facilitates the maintenance of the Supplier catalogue and the description of the products and/or services, prices, etc being offered.	Risk 1.	**Processing e-Catalogues according to multiple formats.** In this case uploading the e-Catalogue into the back-office would most likely involve the use of automatic transformations and also manual operations. ***NOTE*** Specific controls should be implemented in the above mentioned operations. For additional information about the constraints applicable within the public procurement domain regarding interventions on the catalogue of the Supplier by the Customer please see [REF 1] up to [REF 4].
Goal 2.	**Improved traceability between Purchase Orders and the Supplier catalogue.** The versioning and archiving of the e-Catalogue facilitates the traceability between the Order and the right version of the e-Catalogue.	Risk 2.	**Inefficient e-Catalogue quality verification.** The quality verification process risks to be time-consuming and to demand significant effort by the Customer.
Goal 3.	**Systematic use of open standards** to describe the catalogue and its content. This enables a more complete, accurate, uniform and up-to-date description of the products and/or services, prices, etc offered by the Suppliers. The consistent use of an open standard classification scheme is also an enabler of the re-use of catalogues in several processes linked to pre and post-award.	Risk 3.	**Multiple standards and specific customisations.** The availability and usage of several classification schemes leads to low interoperability with regards to the content of the e-Catalogue between Customer and Suppliers.

Customer Side			
Business Goals		**Potential Risks**	
Goal 4.	**Enterprise-wide access to corporate procurement capabilities via a single corporate catalogue.**	Risk 4.	**Integration with multiple online catalogues.** The 'punch-out' (from the Customer system) of a basket of products and/or services selected using an online catalogue available on the Supplier's online website will very much depend on the use of compatible standards by the Supplier and the Customer. This option is not aligned with the implementation of a corporate catalogue.
Goal 5.	**Alignment between the catalogues used in pre and post-awarding processes** to: • Increase the productivity, efficiency and effectiveness in the creation of Customer-centric catalogue templates which are used in Tender documents. • Assuring coherence between the catalogues used in Pre and Post awarding purposes. • Enabling the creation of statistics of what is requested from Suppliers in the RFPs and what is ordered from these Suppliers. All of the above strongly depends on the reuse of product and service classification schemes in both contexts.	Risk 5.	**Not fulfilling the needs of pre and post-awarding** taking into account their similarities but also their specificities.
Goal 6.	**Enabling multilinguism in the catalogue**, at all levels (e.g. XML message, product and/or service classification codes…) today's standards (e.g. CPV) include official translations in multiple languages.	Risk 6.	**Not achieving global reach**, in every standard the number of available languages is limited.
Goal 7.	**Position on the market** where new suppliers join, product and/or service details vary, and special purchase offers are made.	Risk 7.	**Unclear catalogue updating procedures.** The conditions and timing of such updates, as well as, aspects relating to the utilisation of partial and full the catalogue must be clearly specified.

Table 6 Common business goals linked to e-Catalogues by Customers

WRAP UP There are many business goals for the implementation of e-Catalogues but also many potential risks. Therefore, a critical success factor for the implementation of e-Catalogue lies in the management and integration of e-Catalogues within an overall vision for e-Procurement. For maximum benefit, this vision should encompass both pre and post-awarding processes. In practice, this means that all stakeholders must be involved and informed about the implications and linkages between the e-Catalogue of pre and post-awarding. Once commitment is reached on the overall vision, management support is required to keep stakeholders engaged in the execution phase and the linkages with the ordering and billing processes.

3.1.1.4. Business Goals of the Supplier

The table below provides information on the most common business goals linked to the implementation of e-Catalogues by Suppliers. For each business goal sources of risk are also identified. These sources of risk are not just technical, but can also be organisational or related to the business process. The identification of risk sources provides the reader with a broader view on the challenges linked to the implementation of an e-Catalogue system. This summary table is based on the several reference documents used in the writing of the Study.

Supplier Side			
Business Goals		**Potential Risks**	
Goal 1:	**Systematic use of standards** to describe the catalogue and its content. This enables a more complete, accurate, uniform and up-to-date description of the products and/or services, prices, etc offered by the Suppliers. The consistent use of a standard classification scheme is also an enabler of the re-use of catalogues in several processes linked to pre and post Award.	Risk 1.	**Multiple standards and specific customisations.** The availability and usage of several classification schemes leads to low interoperability with regards to the content of the e-Catalogue between Customer and Suppliers.
Goal 2:	**Reduction of order-processing costs and cycle times through more accurate and uniform catalogues.** The electronic exchange of catalogues facilitates the maintenance of the Supplier catalogue and the description of the products and/or services, prices, etc being offered.	Risk 2.	**Operational costs for creating and maintaining the catalogue** in accordance to the specifications of each Customer (e.g. use of transformations and possibly involving manual operations). This also involves the way the pricing mechanism is build and how the products and/or services are described.
Goal 3:	**Cater for the request of Customers** regarding the exchange of catalogues.		

Table 7 Common business goals linked to the implementation of e-Catalogues by Suppliers

WRAP UP The Suppliers would also benefit from the standardisation of the format and content of e-Catalogue. In particular of Customer-centric catalogues. This is mainly linked to the simplification of their creation and maintenance.

3.1.2. Business Context

3.1.2.1. Overview

The EC is divided into some 40 directorate-general (DGs) and services, which are subdivided in turn into directorates, and directorates into units. The purchasing systems and processes of the EC are currently organised along federal lines, in accordance with its decentralised structure. DGs have over the years developed their own systems and methods for managing and monitoring purchasing procedures. Call for tenders may involve several participating institutions (DGs of the EC and/or other institutions of the EU). The resulting contract may apply to all the participants. This set of institutions present themselves as a sort of consortium with a leading organisation. The framework contract is signed by the leading organisation's authorising officer. Once the framework contract is signed, however, actual execution is carried out in a decentralised manner through specific contracts concluded between each organisation and the Suppliers. All participants are therefore interested in using the catalogue of the framework contract. In this context, the origin of the catalogue structure is, in the vast majority of cases, the call for tenders file which includes the Customer-centric catalogue template, product and service classification scheme and other requirements which must be used by the Supplier when responding to the Customer with an offer. Once the framework contract is signed, the catalogue is exchanged between the Customer and Supplier. As a rule, contracts have three parts: special conditions, general conditions and annexes, which normally form an integral part of the contracts. The figure below provides a high-level view of the several documents in the scope of the creation the catalogue.

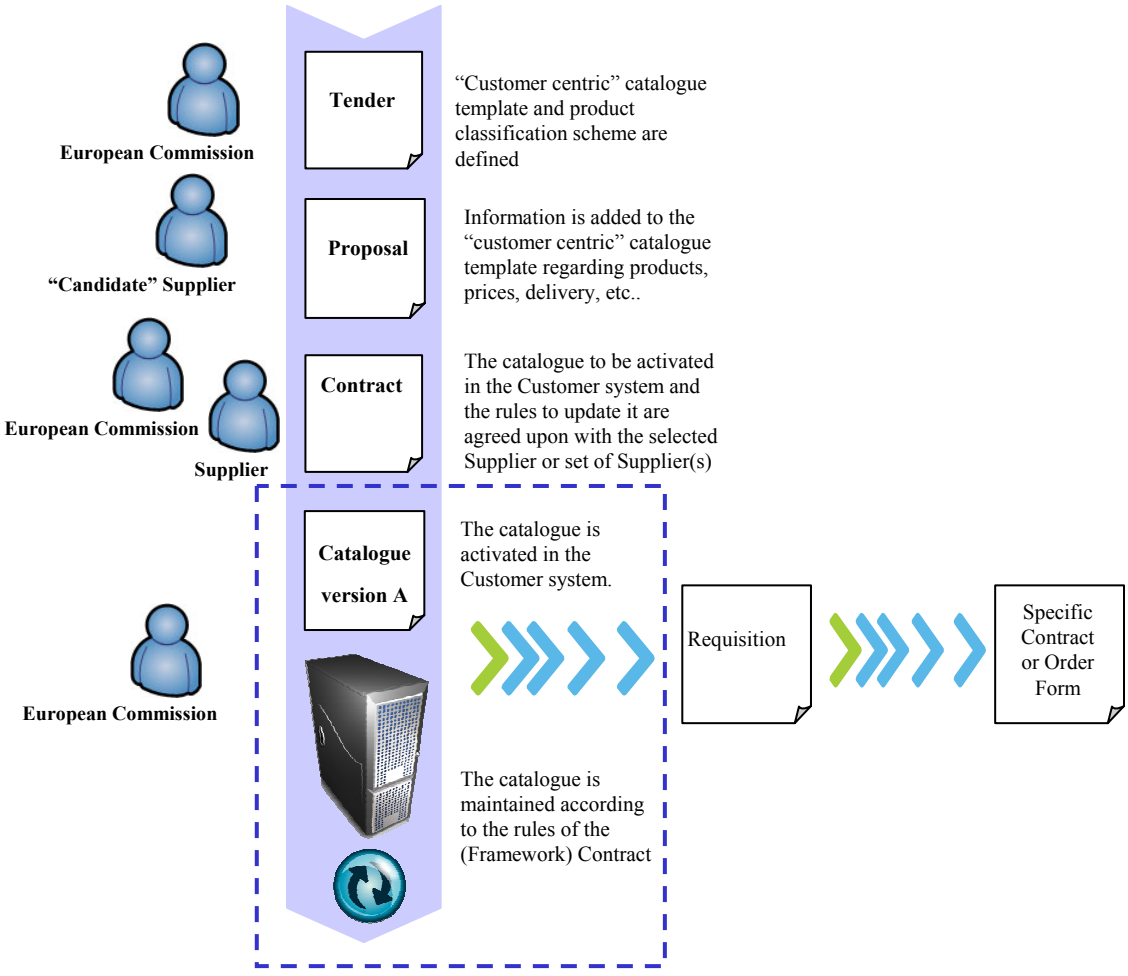

Figure 8 Documents and processes linked to the creation of the (post-award) catalogue

Afterwards, the e-Catalogue is an important tool for the execution of the framework contract.

At the EC, the Customer consults the catalogue to prepare the requisitions of goods in the scope of the framework contract. The catalogue data is used in the creation of a requisition. Once the requisition is approved, it leads to the creation of a Specific Contract or Order Form with the specific Supplier.

Another important element to keep in mind is that catalogues are living documents. The catalogues linked to contracts for transactions extending over several years may include price review clauses (indexation clauses) – an upward or downward adjustment of the contract price to bring it into line with the current market value of the goods and/ or services covered by the contract. Additionally, change request processes are often foreseen to update the initial product and/or service, prices, etc specification in the catalogue. The figure below provides a high-level view of the update process of the catalogue in the context of a change request initiated by the Supplier.

Under the current practice, the updated e-Catalogue is fully (re-)created and re-submitted to the Customer by the Supplier. Then, the verification checks take place before the contract amendment is signed and that the changes are uploaded into the back-office of the EC.

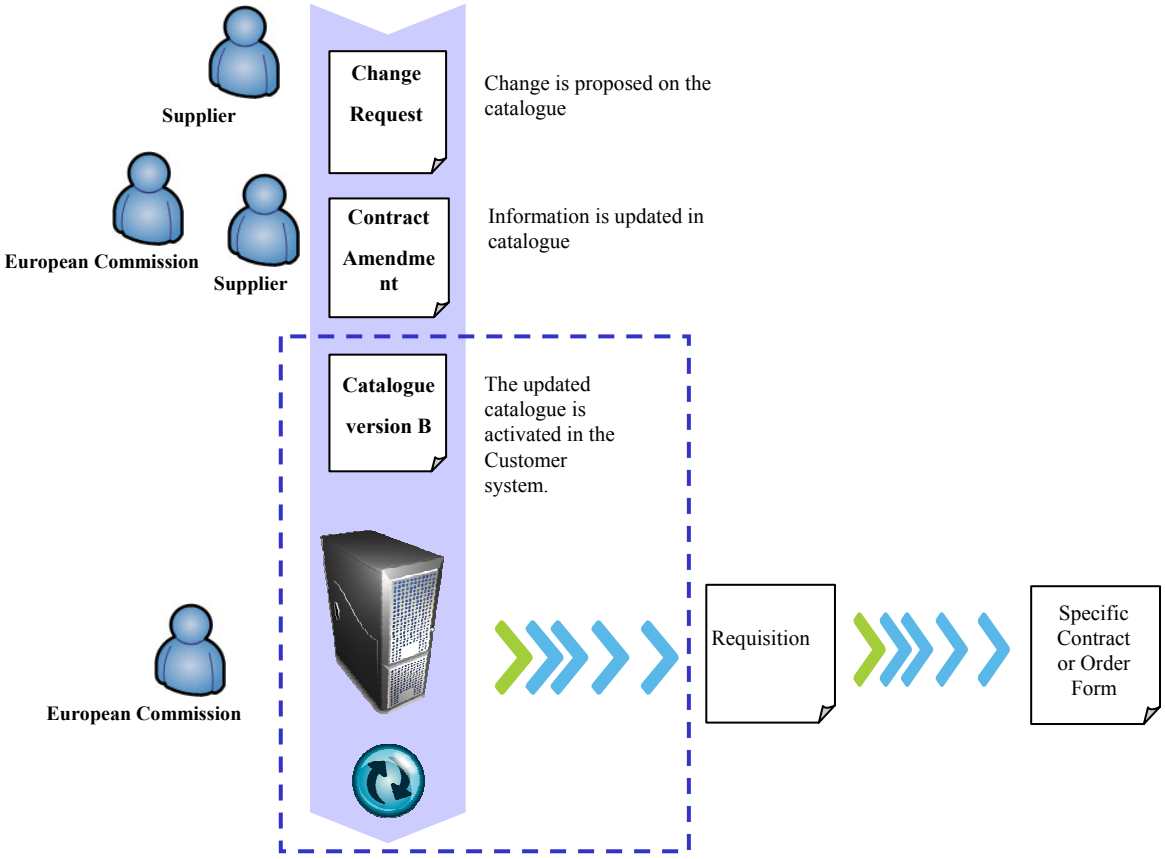

Figure 9 Documents and processes linked to the update of the (post-award) catalogue.

WRAP UP The pre-awarding processes are fundamental for the standardisation of the catalogue format and contents. The origin of the catalogue structure is, in the vast majority of cases, the call for tenders file which includes the Customer-centric catalogue template. The post-award catalogue inherits this same specification.

3.1.2.2. Stakeholders

This section provides a brief profile of the stakeholders involved in the e-Catalogue project. Despite that not describing their specific requests, the tables below provide a brief description of

their expectations (column 'Success Criteria'). The business needs of these stakeholders can be found in section 3.5.1 Stakeholder Needs. The needs of these stakeholders are the basis for determining the requirements of the e-Catalogue solution. The tables below list both the internal and external stakeholders to the EC.

Internal Stakeholders		Type	Description	Success Criteria
Departments of DIGIT	DIGIT/01 - European e-Government Services (IDABC)	Sponsor	The Study is sponsored by the IDABC initiative. The guidelines of the IDABC programme and its interoperability framework are structural pillars of the Study.	Piloting of interoperable e-Catalogue services in line with European wide standardisation initiatives.
	DIGIT/R/2 - Finance and Contracts	Legal manager of the FC and User of the catalogue regarding their contractual compliance	This unit of DIGIT is responsible for managing the contractual relationship with the Supplier and ensuring the financial execution of the ICT budget for the DGs and units of DIGIT.	Reduced time to contract through the simplification of business processes in accordance to contractual rules.
	DIGIT/R/3 – Logistics	User of catalogue in the back-office e.g. creates Order	This unit of DIGIT manages the whole lifecycle of informatics equipment (including orders, maintenance, recording into and removal from inventory).	Reduced purchasing cycle time interval through the simplification of business processes.
	DIGIT/A/2 - Corporate Infrastructure Solutions for Information Systems	Technical manager of the FC and User of the catalogue in the back-office e.g. publishes catalogue online	This unit of DIGIT is responsible for the technical and contractual follow-up. More specifically, in the context of the 'Product Management Lifecycle', it helps in the selection and procurement of products and services, and maintains technical product information in DIGIT's Product Management Portal service (a.k.a. DIGITLine).	Information in the catalogues is available for consultation and up to date. This should be achieved in a way that facilitates the search of information by the Users of the catalogue.

Internal Stakeholders		Type	Description	Success Criteria
	DIGIT/B/4 - Information Systems supporting Policies, Financial Management and Activity Management	Performing the e-Catalogue project	This unit of DIGIT is responsible for the development and maintenance of the information systems of DIGIT playing a role in the Procurement Business Process (e-PRIOR and the back-office system).	Delivery of the e-Catalogue project in time, budget and with the required quality.
Other Directorate Generals of the EC	DG-MARKT/C/4 Economic Dimension of Public Procurement; e-Procurement	Co-sponsor and Contributing to the Study	This unit of DG-MARKT is responsible for the implementation of the e-Procurement features of the Public Procurement Directives 2004/17 and 2004/18 that should help open up public procurement, improve the functioning of the Internal Market in the field of Public Procurement and enable the EU to reap the full benefits from an enlarged Internal Market. Regarding the Study, specific support has been provided on the concept of e-catalogues in public procurement, requirements for e-catalogues in public procurement and the use of the CPV classification.	Wider adoption of e-Catalogue in Europe in accordance with the requirements of the legal framework set by the EU public procurement directives. Test use of the CPV as the preferred Classification / interface scheme of the Pilot project.
	JRC/D/1 Management Support	Influencer, User (i.e. purchasing organisation and/or leading organisation).	This unit of JRC is interested in the results of the Study and therefore it is also contributing to it. In short, JRC is also interested in a more effective and efficient use of catalogues.	Simplification of business processes through standardisation and tool support.

Internal Stakeholders		Type	Description	Success Criteria
	OIB/OS/3 Mobility and Suppliers	Influencer, User (i.e. purchasing organisation and/or leading organisation).	In the last years, this unit of OIB has been working on the implementation of e-Catalogues and is therefore contributing to the Study.	Simplification of business processes through standardisation and tool support.
Organisational roles of the European Commission.	IRM	User of the catalogue in the back-office e.g. creates Requisition	The IRM is a role present in each DG, responsible for the following tasks: • Identify the needs of the end users and IT community regarding IT tools and products and monitor the market in order to fulfil these needs adequately. • Manage the life-cycle of products and tools, in close collaboration with the DGs and with respect to the rules governing public procurement and budget. • Place requisitions for products to the back-office of DIGIT where the catalogue is stored.	Information in the catalogues is available for consultation and up to date. This should be achieved in a way that facilitates the search of information by the Users of the catalogue.
	Leading Organisation	User of the catalogue	Prepares the tendering documents and coordinates the full tendering process. The framework contract is signed by the leading organisation's authorising officer.	Reduced time to contract through the simplification of business processes in accordance to contractual rules.

Internal Stakeholders		Type	Description	Success Criteria
	Purchasing Organisation	User of the catalogue	Once the framework contract is signed, the actual execution is carried out in a decentralised manner through specific contracts concluded between each Organisation and the Supplier.	Reduced purchasing cycle time interval through the simplification of business processes.

Table 8 Internal stakeholders

External Stakeholders		Type	Description	Success Criteria
Suppliers	Suppliers (a.k.a. economic operators)	User of the catalogue regarding its creation and submission	The Supplier is responsible for the: • Provision of products and/or services specified in its catalogue. • Delivery and maintenance of products and/or services in its catalogue.	Reduced purchasing cycle time through the simplification of catalogue creation and maintenance.
	Third Party (a.k.a. Service Provider)	User of the catalogue regarding its creation and submission	The Supplier may appoint a Third Party to act on its behalf for the catalogue delivery and maintenance.	Simplification of business processes through standardisation and tool support.
Standardisation Bodies	CEN/ISSS WS/BII	Influencer	This workshop focus on business interoperability interfaces for public procurement in Europe. Its main goal is to identify the required business interoperability interfaces related to pan-European public e-Procurement, taking due account of current and emerging UN/CEFACT standards.	Cooperation between projects
	Other (UN/CEFACT, CEN/ISSS)	Influencer	As mentioned above UN/CEFACT is a source of input to the CEN/ISSS BII/WS. This and other initiatives such as the CEN/ISSS WS/eCAT have provided valuable input to the Study.	Cooperation between projects

Member States	PEPPOL	Influencer	Work Package 3 of this project is currently working on a pilot of e-Catalogue at European wide level.	Cooperation between projects
	Individual Member States	Influencer	Are currently participating in the PEPPOL project and will therefore be part of its European wide e-Catalogue pilot.	Cooperation between projects

Table 9 External stakeholders

3.1.2.3. Information Systems

The tables below list both the internal and external information systems to the EC which were taken into account in the Study.

Internal Information Systems		Type	Description
Customer (a.k.a. Contracting Authority)	Legacy Purchasing Systems	ERP like systems	In the EC there are several systems supporting the purchasing process from the initial requisition to the payment of the Invoice. An e-Catalogue system will need to foresee mechanisms to communicate with all these legacy systems.
	e-PRIOR	Service-oriented message exchange platform	e-PRIOR is the service-oriented platform currently being developed by the European Commission, DIGIT. This enterprise application aims at making available via electronic means several services related to the post-awarding stages of public procurement (i.e. ordering and invoicing). Given the role of intermediary between the external world and the back-office applications of DIGIT, e-PRIOR is designed to interoperate with a large number of applications of heterogeneous nature. For additional information on e-PRIOR the reader should consult [REF 7].

Table 10 Internal Information Systems

External Information Systems		Type	Description
Suppliers	e-Catalogue management systems	ERP like systems	The ERP like systems of the Supplier supporting the management of the Supplier's catalogue. In this study, it is assumed that almost all the existing e-Catalogue management systems have the possibility to export their data into a spreadsheet.

Table 11 External Information Systems

3.1.2.4. Purchasing Process Typical Pain Points at the EC

The table below provides an overview of the pain points regarding the current exchange and use of catalogues at the EC.

	Organisation	Processes	Systems
Time	• Several organisations have to maintain and control the multiple sources of catalogue information.	• Given that the price is seldom available in the back-office catalogue, the price of the products is requested to the Supplier upon creation of the Order template.	• Duplication of information may create inconsistencies.
Quality	• Different classification schemes are used depending on the framework contract to which the catalogue belongs to.	• Given that there are no standardised catalogues – even if already exchanged in electronic formats. Catalogues are currently manually entered into the Back-Office system.	• Given the complexity and variety of pricing models in the Framework Contracts, the Back-Office does not provide information on the prices of the services associated to products.
Cost	• Maintenance of several classification schemes. • Creation of the catalogue templates in tenders which aren't reusable.	• Given the different classification schemes in use, statistics on the full purchasing cycle are hard to be produced and compared.	• Given the inexistence of a corporate wide catalogue system, several local catalogue systems are maintained.

Table 12 High-level pain points of the purchasing-related processes at the EC

3.1.2.5. Catalogue Implementation Patterns at the EC

The current implementation pattern of catalogues at the EC is very similar to the description in the report on e-Catalogue released by DG-MARKT (see [REF 1]):

"At present, specifications for eCatalogue prospectuses to be used in a public procurement procedure are, if admitted at all, fully defined by the contracting authority (…) their specifications are tailor-made to the needs of the public purchaser and generally do not make use of any existing / industry eCatalogue standards. Under this current practice, contracting authorities request suppliers to fill in eCatalogue templates (usually in spreadsheet files). These spreadsheet files are then submitted by the suppliers using various, often inappropriately secured, electronic means (e.g. e-mail, CD-Rom, etc). This approach creates additional costs for all involved parties: for suppliers in order to create appropriate individual prospectuses instead of re-using their existing ones and for contracting authorities in verifying the technical compliance of those prospectuses against the imposed specifications."

This extract, part of the aforementioned report, is still valid today. Electronic means are already used to exchange catalogues. However, the content and format of these catalogues is mostly bespoke.

Context	Current Implementation Pattern
Public Procurement	**Customer-centric catalogue** In this approach, Suppliers prepare the catalogue in electronic format, usually in a spreadsheet, following the formalisation of the contractual relationship between the Customer and the Supplier or Suppliers i.e. awarding of the framework contract to the Supplier(s).

3.1.2.6. Generic Business Goals of the EC

The table below provides information on the most common business goals linked to the implementation of e-Catalogues by the EC. For each business goal sources of risk are also identified. These sources of risk are not just technical, but can also be organisational or related to the business process.

European Commission Study Case			
Business Goals		**Potential Risks**	
•	The creation of catalogues must be easier, less complex in its totality (i.e. not simply moving workload from one entity to another), more transparent and more streamlined. This would benefit the Customer when creating catalogue templates for new tenders and the Suppliers both in pre and post awarding processes. The purpose of simplification is to contribute to one or all of the following: • Effectiveness, i.e. achieving the right results (output/outcome); • Efficiency, i.e. the trade-off between the level of expected results and the resources used (value for money); • Economy, i.e. a reduction in resources used (e.g. staff, time and money). A typical issue in public procurement is that Contracting Authorities have the practice to create ad-hoc formats and classification schemes in the tender's catalogue template. This same issue happens in the European Commission. Therefore, following the framework contract signature, the selected Supplier(s) must continue using, in the creation and maintenance of the Post-Award catalogue, the classification scheme of the particular framework contract. Reducing this complexity through standardisation is a goal of many initiatives already mentioned	Risk 1.	The EU institutions, in collaboration with the Member States, are currently working on the dissemination of CPV as a standard classification scheme for Public Procurement. This project is also an opportunity to analyse the practicalities of using CPV as a bridging classification scheme between the multiple ones of the Pre Awarding Phase and the one of the DIGIT's back-office which stores the catalogue for Post Awarding purposes. The challenge are to evaluate the: • Overall feasibility of the approach; • Responsibility for the mappings; • Alignment with PEPPOL strategy. The reader should consult chapter 5, section 5.4.3 Mapping Classification Schemes to CPV for further details. Currently it is foreseen that the format of the e-Catalogue will be aligned with the decision

European Commission Study Case			
Business Goals		**Potential Risks**	
	in this study. Using a standard catalogue format and standard classification schemes may greatly contribute to the simplification of the creation and maintenance of catalogues.		taken by PEPPOL regarding the standard to be used in their pilot.
•	Promote a higher degree of standardisation of the format and content of the catalogues. This being an enabler of: • Operational efficiency; • Enhanced transparency and reliability of information; • Enhanced security of information. For the Customer and also to the Suppliers.	Risk 2.	In the short term the existing framework contracts will continue to use their own classification schemes and other non-standard arrangements.
•	Reduction of costs related to delays in the ordering process. The use of e-Catalogue promotes an ordering process where less data is manually entered. Consequently, the use of accurate data enables an ordering process with fewer errors. Ultimately this would contribute to the reduction of the purchasing cycle time interval.	Risk 3.	The full benefits of e-Catalogue can only be achieved with a long term vision. In the short term the existing framework contracts are very tailor made. This means that some particular aspects may not be subject to automation.
•	Contribute to the specifications being produced by the CEN/ISSS BII/WS on business interoperability interfaces for public procurement in Europe.	Risk 4.	At this moment the CEN/ISSS BII/WS is near to its closing. Therefore, this project is more likely to contribute to the work of PEPPOL.

Table 13 Business goals linked to the implementation of e-Catalogues at the EC

3.2. As-Is Business Processes

3.2.1. How to read the Business Process Analysis

The Business processes are modelled on four levels of abstraction. Level zero displays the value added chain of the procurement. The first level gives a high-level overview of the macro processes. They have not been represented as such in a diagram but correspond to sub chapters of the as-is chapter.

Level II diagrams 'zoom in' i.e. detail one specific Level I sub process. The Level II diagram will have the same name as the corresponding Level I sub process name, they mask the complexity of all performed activities in order to obtain a global understanding of how sub processes are linked. These diagrams are called Activity Diagrams. Vertically, they are divided by 'swim lanes' for each role which is defined. Note that a role can be an organisational item such as a department, or can be a functional title such as Sales Manager, or can be even a system.

The interaction between the roles is indicated by the activities ellipses. The text field in the ellipse indicates the activity for which the role or actor is responsible. A role with a blank ellipse means that this role is not taking the lead in the overall execution of this particular activity.

However, the role is involved because there is some interaction with the leading role in order to complete the activity e.g. ‘send a document’. The outcome of a business process flow can be made conditional. This is indicated by the diamond symbol. An activity diagram always starts with a precise begin state and will always end in a particular end state.

Specific activities are further zoomed in by corresponding Level III diagrams. The level III diagrams provide the sequence of detailed activities performed by roles in order to reach the process output, they are called Activity Diagrams.

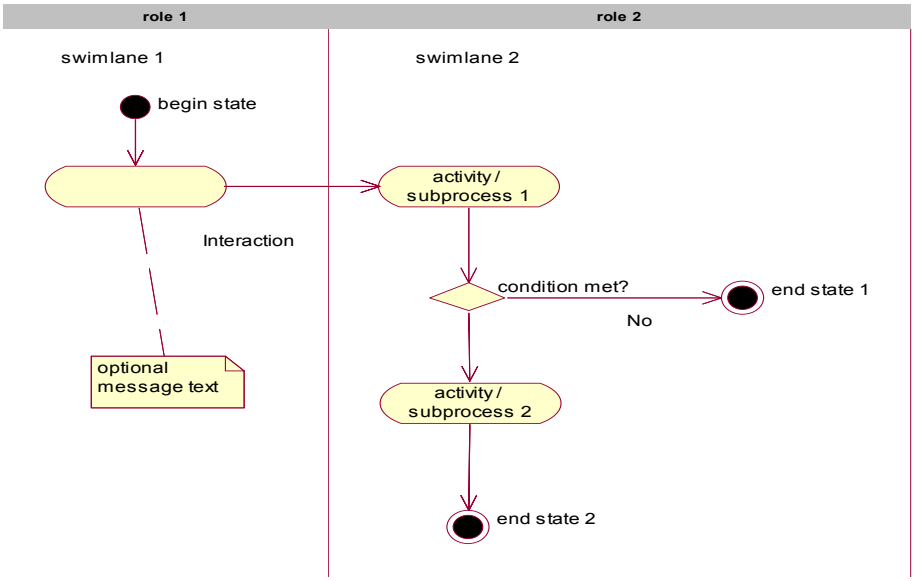

Figure 10 Example of an activity diagram

3.2.2. As-is "Manage (DIGIT) Framework Contract Catalogue Master Data" process

The figure below describes the way the framework contract catalogue information is managed at DIGIT.

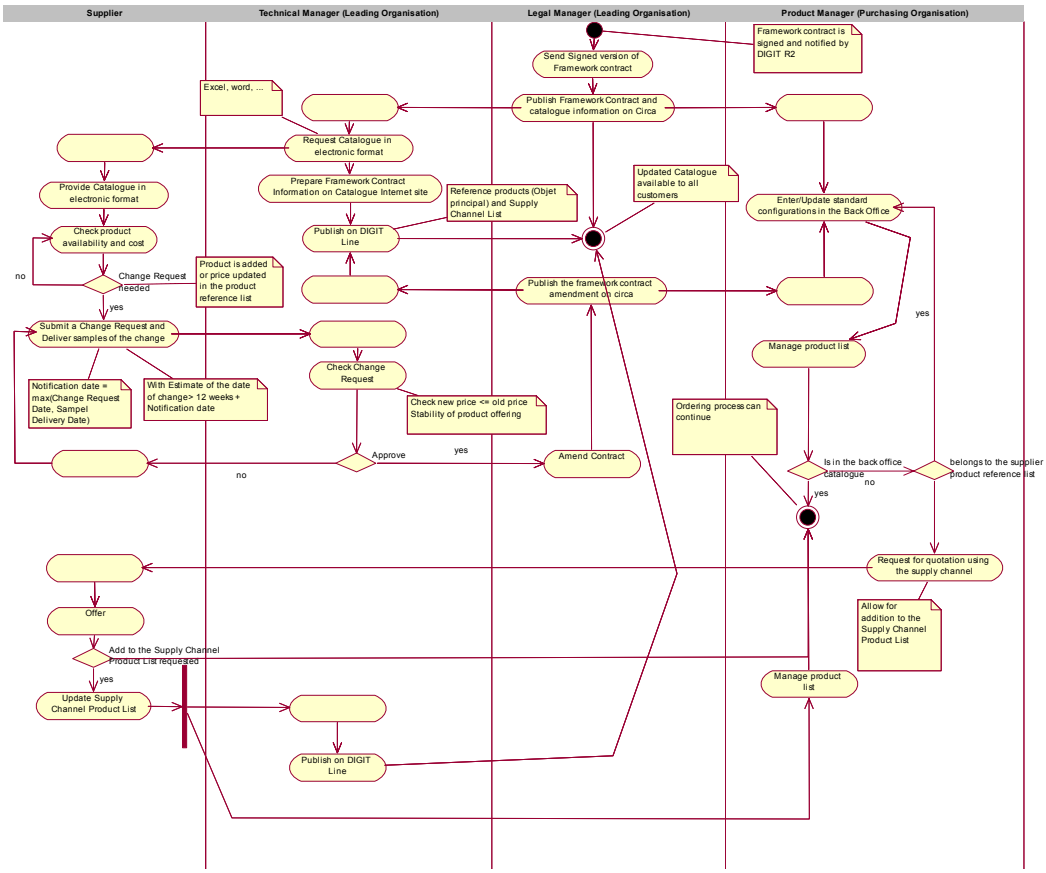

Figure 11 As-is manage (DIGIT) Catalogue master data process

This diagram displays the various actors that contribute in the maintenance of the catalogues linked to the framework contracts of DIGIT.

Currently, there are three storage areas for the catalogues that are available to IRMs to prepare requisitions:

- Circa, which is an intranet site with secured access where framework contracts and catalogues with price lists are stored, and where IRMs can subscribe to any update.
- DIGIT Line, which is also an intranet site, containing no pricing information but more technical explanations of the framework contracts.
- Back-office framework catalogue, limited to flagship products within the reference product list and purchased products with product management characteristics, mainly for inventory purposes.

After the selection process, and before the signature of the framework contract, the Supplier provides a list of products and associated services and their prices, usually in Excel format, via various communication channels (e.g. e-mails, CD-Rom). The Supplier performs manually many adjustments in the format and content of its catalogues, in order to generate a catalogue which meets the requirements of their specific framework contract. The reuse of specifications among framework contracts is low and therefore many variants of catalogue exist.

The paper framework contract is signed by both parties and the Legal Manager[5] of the Leading organisation publishes it in Circa which guarantees a secured access to confidential pricing information. All authorized parties having subscribed to it are notified and can access the text of the framework contract and catalogues. The information available on Circa is rather difficult to consult especially when lists of products and/or services are extremely large.

Periodically, catalogue prices or reference product list may change. These changes are reflected in Circa by manual intervention of the Legal Manager who uploads the new price list after having registered the legal amendment.

History of versions is not easy to follow especially when framework contracts amendments are managed in an update mode.

Therefore, some technical managers[6], especially for framework contracts involving an extremely large products list, request to their suppliers an electronic format of the catalogue, check it and publish it on an intranet site (DIGIT Line) with the IRMs as target audience. The technical manager also needs to follow-up changes in the catalogue list in order to reflect them on the intranet site.

These activities are not formalised in DIGIT for the moment.

IRMs can access both Circa and, in some cases, DIGIT Line to be aware of the list of products available to cover their needs and prepare a requisition. In order to cover a given need, the IRM expresses a requisition in the form of a request in the back-office IT system, which displays the back-office catalogue where only flagship products are listed for a given framework contract.

The IRM can then describe the product he needs, or use a reference to the DIGIT Line catalogue, or use the catalogue information displayed in the back-office catalogue.

The purchasing organisation analyses requisitions, manages the back-office product list by adding missing products and prepares orders referring to the back-office product list.

Managing the back-office product list focuses on adding characteristics necessary for inventory management mainly.

The ordering process can then follow its own lifecycle (See Chapter 3.2.3).

3.2.3. As-is DIGIT level II Purchase Process

The figure below describes the way the generic purchasing cycle explained in chapter 3.1.1 is currently implemented at DIGIT.

- The IRM prepares and creates the requisition.
- The Purchasing Organisation verifies the requisition against internal rules and framework contract rules and then establishes the specific contract in relationship with the Supplier.

[5] Legal managers are civil servants whose responsibility is to establish the legal clause of the framework contracts in accordance with market regulations and the Commission financial rules.

[6] Technical managers are civil servants whose responsibility is to develop specific expertise on a range of products or services that could be procured by the Commission. They are among others responsible of creating specifications for call for tenders.

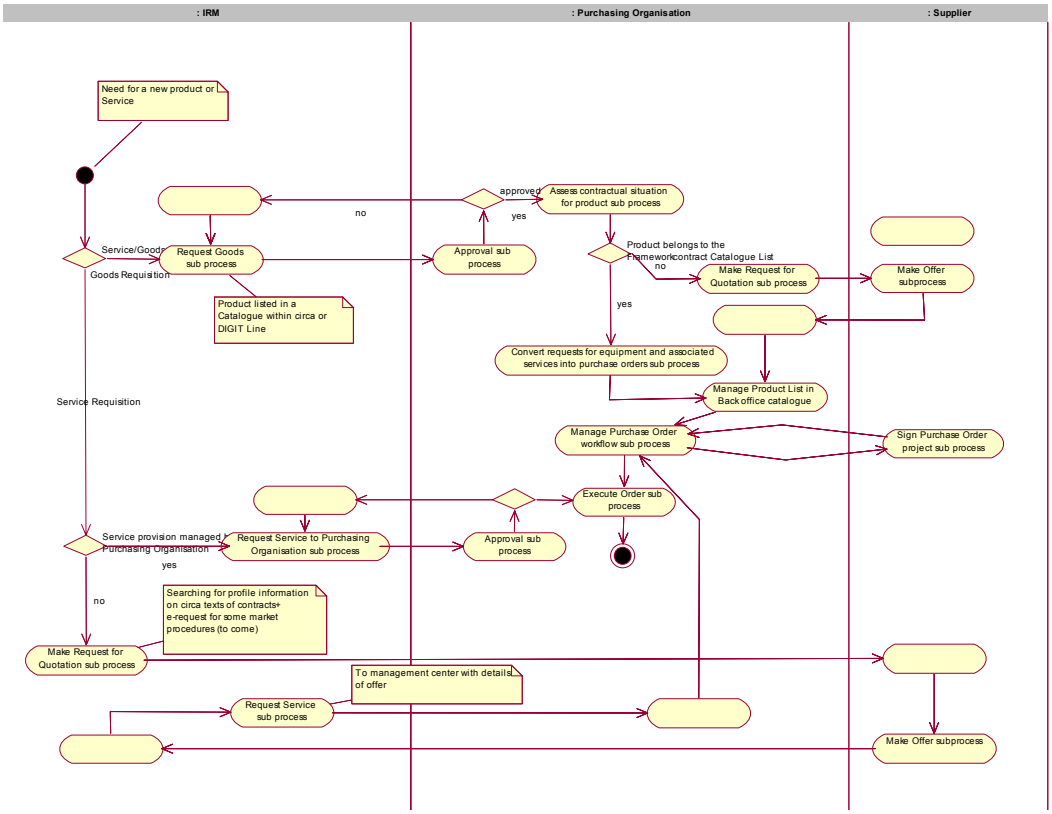

Figure 12 Level II purchasing process at DIGIT

The above diagram is designed at a high-level perspective in order to depict the level of integration of the catalogue master data and the requisition process and ordering process (i.e. the full purchasing process) at DIGIT. Furthermore it highlights the differences between products and services framework contract execution.

The execution of a framework contract starts with the requisition process initiated by the IRM.

The Prepare requisition activity differs drastically between requesting services and products:

- In order to create a requisition of services, the IRM needs first a preparation phase in which he assesses:
    - Whether the supply of services is under the responsibility of a purchasing organisation that purchases services on a lump sum basis and then organises the works on demands expressed in terms of Service requests addressed to the purchasing organisation (e.g. moves or maintenance of standard materials). In this case, the IRM will create a Service request to the responsible organisation.
    - Or whether the supply of services needs a full ordering process that the IRM has to initiate from a request for quotation to the draft order. In this case, the IRM needs to browse the framework contract catalogue information on profiles that are accessible in the paper annexes of the framework contract stored in Circa, in order to launch a request for quotation. Only after having selected the offer, the IRM will be able to create a requisition.
- In order to prepare a requisition of goods, the IRM may access:
    - The intranet site of the Directorate General responsible for the purchasing process (DIGIT Line) to discover the products available in the various catalogues of the framework contracts
    - Or the back-office catalogue providing information on the most commonly used products.

    - Once the IRM has chosen a product from the product reference list, he creates a requisition. Then, the IRM submits his requisition to the purchasing organisation (DIGIT) that executes the ordering process. The purchasing organisation matches the requisition with the reference product list that he can find on circa. If the product belongs to this list, the purchasing organisation groups[7] the requests in order to make specific contracts under the framework contract with larger quantities than the individual requisitions.
- In case products do not belong to the product reference list, the supply channel clause of the framework contract, when existing, still enables to make dedicated negotiated procedures to cover the specific requisitions providing sufficient justifications. In such a case, products bought via the supply channel may be added to the supply channel list of products. This happens when it was specified in the specific contract that the product should be added into this list.
- If not present, products are always added to the back-office product list at the time they are purchased.

3.2.4. As-is Catalogue data model

Managing the back-office catalogue and product list is handled in the following data model:

[7] When there are timing constraints, the requests may be transformed into specific contracts directly.

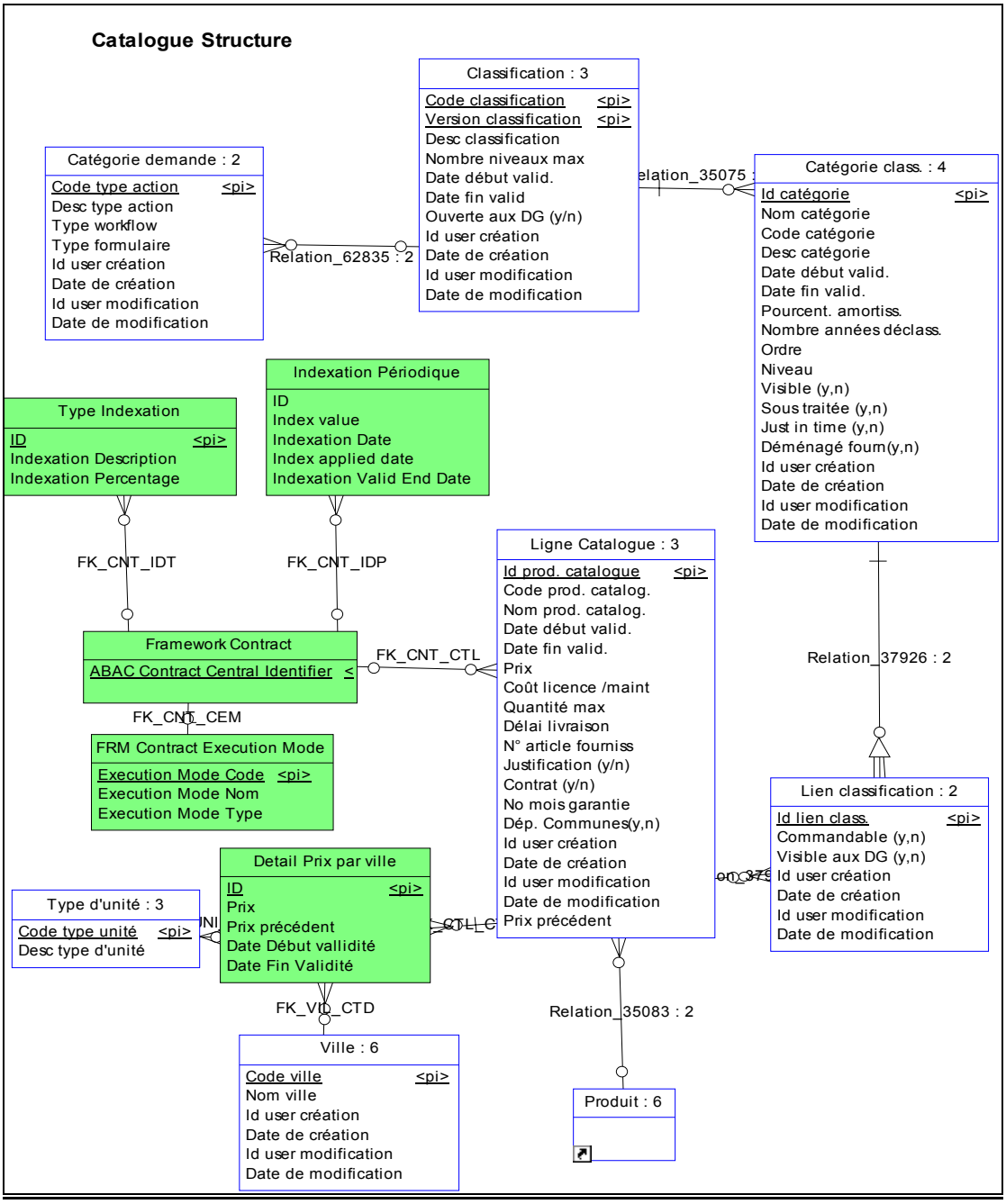

Figure 13 Extract of DIGIT's back-office documentation in French - Logical data model of the back-office catalogue

The back-office system manages in the 'Catégorie Class' repository several nomenclatures dedicated to specific functionality.

There is one nomenclature that aims at providing browsing functionality of framework contract catalogue items handled in a 'Ligne Catalogue' repository.

As mentioned in Chapter 3.2.2, the 'Ligne Catalogue' referential contains only flagship products of the framework contract reference product list and none of the supply channel product list. Among flagship products detailed in the catalogue, standard configurations for PCs are defined.

In case of services, the back-office catalogue also manages some contractual structured information enabling automation of the execution of the framework contract.

The ‘Ligne Catalogue’ repository can be viewed from the back-office Requisition module of the DIGIT legacy system but does not provide the whole reference product list.

When an item is in the process of being purchased, the purchasing organisation updates the back-office product list managed in the ‘Produit’ repository that contains information enabling automation of inventory management.

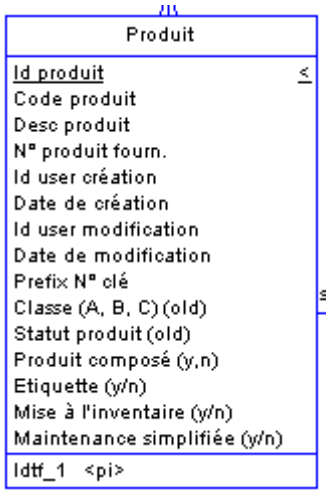

Figure 14 Extract of DIGIT’s back-office documentation in French - Logical data model of back-office product list

3.2.5. As-is Main Findings

The DIGIT Manage Catalogue process detailed above is a trans-organisational process that is not highly formalised. Attempts to improve the *Consult Framework Contract Catalogue* activity have been put in place by publishing on DIGIT Line these catalogues.

This publication is usually managed by the technical managers, whenever they take the initiative to do so. Suppliers are very reluctant to provide structured XML information directly convertible into web pages. They usually exchange Excel files that are processed by the technical managers to be published. Suppliers usually perform manual interventions on Excel files because the pricing policy is ad-hoc and cannot be directly extracted from their back-offices.

This lack of standardisation and the numerous media breaks along the entire processes does not provide an incentive for the automation of this activity. Additionally, the very specific rules on pricing are also identified as a barrier for the automatic generation of the ‘Customer-centric’ catalogues by Suppliers.

In order to help IRMs to create requisitions on basis of framework contracts catalogues, the back-office catalogue has been created to make the bridge between framework contract catalogues and back-office product lists, but the catalogue partially fails to achieve its goal because of the effort required for its maintenance.

The purchasing process is impacted by the little coverage of the back-office catalogue in respect to several aspects. Searching the catalogue items and their pricing is time consuming. Entering the description of the products in the product list is also time-consuming. Duplication of products is possible. Entering the prices and other conditions for associated services in the purchase is also time-consuming and error prone. Prices have to be entered manually for each order of the same product[8].

[8] Even when the product has been registered in the back office catalogue, its price is not automatically set in the purchase because of the lack of trust on the timely update of information.

WRAP UP The main findings at DIGIT are listed below:

- The Manage Catalogue process is not handled in a formalised and synchronised way and depends a lot on good will of involved actors.
- Suppliers usually prefer exchanging catalogues in Excel format, even when requested to exchange XML files.
- There are three sources for the same information or partial information making discrepancies unavoidable, and making it more effort intensive to maintain and consult.
- Periodical updates of the catalogue introduce confusion when consulting them and generate more effort to maintain.
- No integration with back-office generates duplication of information and an error prone purchasing process, increasing the time-to-contract and purchasing life-cycle.
- The back-office catalogue does not contain a lot of information because of the time consuming maintenance activity it would require.
- Bespoke descriptions are required to be created and maintained for each framework contract. One root cause for this situation is the absence of a consistent and potentially unique product classification scheme as a reference system.

3.3. Best Practices from Member States

Best practices were identified based on the analysis of the study performed by PEPPOL WP3 and the know-how gathered by Member States. In this context, best practises should be understood as the process management procedures and design mechanisms deemed most interesting for our architecture proposal. These best practises are listed in the table below:

Best Practice	Description
1) Quality Assurance of the received e-Catalogue ***NOTE*** Specific controls should be implemented in the above mentioned operations. For additional information about the constraints applicable within the public procurement domain regarding interventions on the catalogue of the Supplier by the Customer please see [REF 1] up to [REF 4].	Based on various experiences in Member States and private companies, the application of quality assurance procedures is vital before the activation of the e-Catalogue in the system of the Customer. • Catalogue Exchange: The catalogue is created and submitted by the Supplier; • Technical approval: all technically invalid catalogues (i.e. with violations) are rejected at this stage; • Content approval: Errors and mistakes which cannot be detected automatically are checked at this stage. The Commercial approval (are the prices correct? do the products correspond to the initial tender?) may be understood as a separate step or still within this step; • Activation of the catalogue in the system of the Customer.
2) The Adoption of the CEN/ISSS WS/BII Profiles	A profile is a technical specification describing: business processes, the business rules governing their execution, possible run-time scenarios, the business commitments achieved and the choreography of electronic messages exchanged. The key standardisation aspect of the profile description is in the semantics rather than the syntax. Following the example of PEPPOL, this project also aims at embracing a common standardisation path through the use of the CEN/ISSS WS/BII work.

Best Practice	Description
3) The choice of CEN/BII as standard format for electronic documents	Following the example of PEPPOL, this project also aims at embracing a common standardisation path through the use of the CEN/ISSS WS/BII work.
4) Party Identification	Based on various experiences in Member States' and private companies' solutions, the EAN code seems appropriate for the identification of the parties, both the Suppliers and the Customers.
5) Guidelines available to the Suppliers on how to fill-out the e-Catalogue	Based on various experiences in Member States, a key element for the successful use of the e-Catalogue is their data quality. According to the report released by DG-MARKT (see [REF 1]): *"Great efforts are dedicated to eCatalogue verification, both automated and manual. There are commonly a lot of errors in the received eCatalogues in terms of format (spreadsheets are not filled in correctly), as well as, inadequate detail in content (poor product descriptions)."* This means that the Supplier should be guided to correctly fill-out the 'Customer centric' catalogue in a proper way. The development of guidelines is an effective way of achieving this objective.
6) Use of a standard product and service categorisation scheme. In the context of the EC, CPV is the preferred option.	PEPPOL is also envisaging to support one or more standard product and service classification systems: CPV, eCl@ss, GPC, UNSPSC, GMDN or other.

Table 14 Best practises collected from Member-Sates

3.4. Regulatory Principles

3.4.1. General principles

The Directives on public procurement (see [REF 22]) do not specify explicit requirements for e-Catalogues; they only authorise tenders to submit offers that "*may take the form of electronic catalogues*". On a more general note, however, recital 12 of Directive 2004/18/EC (see [REF 21]) states that any electronic purchasing technique must comply with the general rules on public procurement of the Directive. Moreover, all rules related to the use of electronic means and to the electronic submission of tenders also apply to e-Catalogues; in particular, Annex X of Directive 2004/18. Annex X provides an extensive list of requirements relating to devices for the electronic receipt of tenders. The aforementioned principles could be summarised as follows:

- General availability and non-discrimination: Electronic means must be widely accessible and easily usable, ensuring equal treatment and non-discrimination, offering the grounds for effective competition. To achieve unrestricted and full direct access to the Contract Documents, all relevant documents must be accessible round the clock, from the date of publication of the notice until the expiry of the deadline for submitting tenders;

- Equal treatment: The information provided by contracting authorities must be the same for all economic operators. The criteria for the award of the contract should enable contracting authorities to objectively compare and assess tenders. The necessary electronic tools and means that economic operators must use for taking part in a public competition must be equally accessible to all suppliers;
- Transparency: The criteria for the award of the contract must be stated in advance and be made available to all interested economic operators;
- Interoperability: The electronic means used and any electronic tools made available by the contracting authority must be interoperable (i.e. tools to function and interact with commonly used equipment and applications, exchange of information or services to be performed satisfactorily between systems and users). Contracting authorities' electronic public procurement ICT systems should have the capability to exchange information or services directly and satisfactorily between other systems and/or users, so as to operate effectively;
- Integrity, confidentiality and security: The system should provide mechanisms for limiting (or if possibly eliminating) unauthorised access aimed at disrupting its normal operation (e.g. malicious attacks), and offer a reasonable level of protection and guarantee of security to economic operators. Any technical problems of an e-Procurement system within the remits of control of the contracting authority must be resolved by the authority. The resolution might involve not only its technical remedy (e.g. fix a network problem), but also non-technical provisions (e.g. extend the deadline of submission of tenders). The contracting authority shall not disclose information forwarded to it by economic operators, and it should be reasonably ensured that, before the time limits laid down in the call for tenders, no-one can have access to data transmitted by any of the competitors;
- Traceability: e-Procurement systems must be capable of documenting the progress of award procedures conducted by electronic means. The original version of all documents and a true and faithful record of all data exchanges with economic operators should be preserved, in order to provide any of the evidence which might be needed in case of litigation. It should be possible to verify what message/data has been transmitted or made available, by whom, to whom, and when, including the duration of the communication. It should also be possible to reconstitute the sequence of events, including any automatic data processing or automated calculations. As a consequence, if a systematic archiving of an image of the full e-Catalogue cannot be put in place, a mechanism to recreate the image of the e-Catalogue at a certain time and date should be designed;
- Punch-out: Apart from the traditional tender submission process, the EU Directives can be understood as allowing an additional way of using e-Catalogues, by which contracting authorities may collect tenders from suppliers, called ‘active collection of tenders’ and occasionally referred to as ‘punch-out’. Provided the catalogues are in conformity with the requirements of the contracting authority (in terms of their content, presentation, format, and tools), the contracting authority may decide to have exclusive access to the catalogue on a dedicated platform or, if the supplier agrees, to have access to it via the supplier’s website. The ‘active collection of tenders’ may be considered as an alternative way to organise tender submission. Hence, all rules and requirements of the EU Directive mentioned in the previous sections for the use of electronic means and the electronic submission of tenders also apply. This means that the active retrieval of tenders must be done in an equitable, fully transparent and non-discriminatory way. Thus it should be performed only once an appropriate notification has been given to all suppliers, and on a ‘frozen’ or ‘snapshot’ format of the supplier's system at a specific point in time and pre-defined in the notification of the call for the competition. It should also be noted that contracting authorities must seek the consent of the concerned suppliers before proceeding to collect tenders in this way.

3.4.2. Specific requirements

The 2007 study by DG-MARKT on e-Catalogues in electronic public procurement provided the following, preliminary, practical clarifications on those principles. A mapping will be provided in the next chapter between the principles which are relevant within the scope of the Study (see section 1.3) and the requirements of the Pilot.

ID	Regulatory Principle	Description
PRINCIPLE 1.	Use interoperable electronic means and tools for communication.	The tools to be used for communicating by electronic means and their technical characteristics must be non-discriminatory, generally available and interoperable with the information and communication technology products in general use. Any tools used for participating in e-Procurement using e-Catalogues, must be able to function and to interact with commonly used equipment and applications.
PRINCIPLE 2.	Ensure equal treatment, non-discrimination and transparency.	In all public procurement calls, contracting authorities must specify the conditions and rules for the creation and submission of tenders. Any specifications for creating and submitting e-Catalogues should be based on wimple and wide-spread formats, which can be accommodated through the use of e-Catalogue standards.
PRINCIPLE 3.	Provide specifications for creating tenders in the form of e-Catalogues.	When issuing calls for tenders, contracting authorities must provide information to economic operators on how to format and submit tenders. E-Catalogue specifications should include the technical mechanisms for submitting an e-Catalogue (e.g. a specialised web interface of an e-Procurement system), as well as, possibly necessary main sections that tenders should include.
PRINCIPLE 4.	Provision of additional information after publication of tender specifications should be avoided; if necessary, it should be performed in a non-discriminatory manner.	Such additional information should not significantly alter the terms of the competition and should be published in the same location as the Contract Documents; all suppliers that have expressed interest should be explicitly notified.
PRINCIPLE 5.	Apply rules for the electronic device for the receipt of tenders / e-Catalogues.	The following specific rules of the above topics are particularly important for the device for the electronic receipt of tenders/e-Catalogues: • The device should accept tenders only until the designated tender submission deadline. Tenders received afterwards, should be rejected by the device. • The device may reject tenders (or generally messages) that could harm

		their systems (e.g. files containing viruses). • The device should provide appropriate information to tenderers in case the tender submission process is not successful. • The device should send acknowledgements of receipts to economic operators that have successfully submitted tenders. • The device should securely lock tenders and protect them against unauthorised access. Traceability operations should record the exact date and time of receipt of tenders. • The device should record all operations performed during the tender submission period, and confirm that no unauthorised access has been detected. • The device should guarantee that information of tenders remains confidential • The device should unlock tenders only after the designated tender opening time has been elapsed and the 'four-eyes principle' is applied.
PRINCIPLE 6.	Use of verification tools for fully automating e-Catalogue verification.	Any verification tools may be integrated with the device for the electronic receipt of tenders/e-Catalogues, in order to ensure that no one can obtain access to tenders until the designated tender opening time.
PRINCIPLE 7.	Provide specific rules and guidelines for performing e-Catalogue updates.	The exact period during which suppliers may update their e-Catalogues can be pre-defined at the establishment of the framework agreement, along with the frequency of updates and duration for committing an update. Suppliers should be given reasonable and adequate notice before the start of an updating period. An 'e-Catalogue update' request, containing the rules and conditions of the update, should be addressed to all suppliers within a framework agreement, clearly defining the time period available to suppliers to respond with an updated e-Catalogue. The updated e-Catalogue should meet all the terms and conditions included in the initial request and be in line with the pre-agreed terms of the framework agreement.
PRINCIPLE 8.	Provide specific rules and guidelines for the active collection of updated	It should be performed only once all suppliers have been appropriately notified, and always within the context of a specific call for

	tenders in the form of e-Catalogues (Punch-Out).	competition, framework agreement or DPS. Contracting authorities must seek the consent of the concerned suppliers before proceeding in collecting tenders in this way. The 'active collection' should be performed on a 'frozen' or 'snapshot' format of the supplier system at a specific point in time, which is pre-defined in the notification of the call for the competition, or within the terms of an established framework agreement or DPS.

3.4.3. DIGIT Contractual requirements framework

General terms and conditions for information technologies contracts (see [REF 23]) are annexed to every contract set by DIGIT. Nevertheless they may be overwritten by clauses specific to each framework contract.

In particular these general terms and conditions explicitly structure the communication of official price lists updates and discounts

These requirements have been taken into account by the Study wherever applicable, and will be further integrated to the list of requirements during the elaboration of the Pilot.

3.5. Requirements

3.5.1. Stakeholder Needs

This section lists the most relevant stakeholder needs deriving from the existing studies and interviews. The priority of each need is set to High, Medium or Low.

ID	Stakeholder Needs	Description	Priority
NEED 1.	Enable the Supplier to submit the catalogue via electronic means.	The Suppliers need to be able to provide the Customer with an electronic version of its catalogue of products and services against the conditions of the framework contract.	High
NEED 2.	Request the catalogue creation.	The Leading organisation needs to be able to request the creation of the Catalogue to the Supplier.	Medium
NEED 3.	Consult the catalogue submitted by the Supplier.	The Leading organisation needs to consult the Catalogue sent by the supplier.	High
NEED 4.	Approve the catalogue content in an automated (or semi-automated) way.	The Leading organisation needs to validate the catalogue provided by the Supplier against the conditions of the framework contract before making it accessible by the target organisations of the call for tender. The catalogue must be validated both by the technical manager and the Legal manager of the Leading organisation. This also applies for each update of the e-Catalogue.	High

ID	Stakeholder Needs	Description	Priority
NEED 5.	Give notice of catalogue acceptance/rejection.	The Leading organisation needs to inform the Supplier that the contents of its catalogue are accepted or rejected. This also applies for each update of the e-Catalogue.	Medium
NEED 6.	Use the approved catalogues to support the Ordering process: - Place requisitions in an automated way. - Facilitate the creation of Specific Contracts or Order Form.	The IRM needs to use the catalogue to create requisitions for products (e.g. hardware or software). The purchasing organisation (e.g. DIGIT/R/3) needs to use the catalogue provided by the Supplier to approve requisitions and create Specific Contracts or Order Form in an automated way.	High
NEED 7.	Exchange the catalogue electronically in a secure manner.	Both the Customer and the Supplier need to interact electronically in a secure way for exchanging the catalogue.	High
NEED 8.	Update the catalogue in an automated and controlled way.	The Supplier needs to be able to update its catalogue within the specific rules and limits defined by the framework contract.	High
NEED 9.	Store each version of the catalogue.	The Leading Organisation needs to trace the Order to the correct version of the catalogue which was used to create it. Each version should correctly provide information about the framework contract or any of its amendments.	High
NEED 10.	Compare different versions of a catalogue.	The Leading Organisation needs to search and compare for specific items in any catalogue.	Medium
NEED 11.	Use of several Product Classification schemes in the catalogue.	The Customer needs to find the products and/or services listed in its catalogue using a standard Product Classification scheme and the one specific to the framework contract.	High
NEED 12.	Handle large catalogues.	The Customer needs to be able to handle large catalogues containing thousands of items.	High
NEED 13.	Ensure consistency between the paper catalogue and electronic catalogue.	The paper version of the framework contract is signed including a paper version of the catalogue. The electronic catalogue must be consistent with the signed paper version.	High
NEED 14.	Find needed products and/or services available in the in force framework contract catalogue.	The Customer needs to search into the approved catalogues to find product and/or services that he needs.	Medium

ID	Stakeholder Needs	Description	Priority
NEED 15.	Trace the electronic catalogue to the related framework contract or amendment.	The Customer needs to know to which version of a contract relates to a given catalogue and to know the latest in force version.	High
NEED 16.	Identify the products and/or services as belonging to the framework contract product reference list or to the supply channel product list.	As the product reference list and the supply channel product list do not follow the same catalogue and purchasing rules, they should be identified in the catalogue. This information, when existing, must structure the catalogue display to the end user.	High
NEED 17.	Include additional services in case of supply framework contracts.	Supply contracts also include additional services such as installation, maintenance fees, etc… These pricing policies must be included in the catalogue.	High
NEED 18.	Include multimedia information of the products in the catalogue	Users need to be able to visualize the products they are intending to purchase.	High
NEED 19.	Identify and describe products and services unambiguously in the catalogue	The Customer needs to have a description identification of each product and service of the catalogue.	High
NEED 20.	Enable the import of well defined catalogues in commonly used formats. And also the export of well defined catalogues to commonly used formats.	The Customer needs to import and export well defined catalogues in commonly used formats. The catalogues to be imported are already approved by the Customer.	High
NEED 21.	Distinguish framework contract catalogue life time product list and associated services lifetime.	The customer needs to access catalogue information on associated services, especially maintenance, during the whole lifetime of the purchased related products and services, even when the product is no more available for purchase.	High
NEED 22.	Include additional information on the products and services of the catalogue	Users need to be aware of additional information providing the context for a given product.	High

Table 15 Business needs

3.5.2. Mapping of Stakeholders Needs to System Features

This section lists the most relevant functional features of the system deriving from the analysis of the stakeholders needs.

Feature ID	Description	Need ID
FEAT 1.	The system must support a service which facilitates the submission of e-Catalogue by Suppliers. This interface must be available to external systems.	NEED 1
FEAT 2.	The system must detect any technical error and non compliance with business rules (e.g. value out of a range, etc.) which might occur during the e-Catalogue submission. Non compliance may lead to the rejection of the e-Catalogue. This information should be made available to the Supplier.	
FEAT 3.	The system must facilitate the submission of e-Catalogue create requests (i.e. a request for the submission of the e-Catalogue) to the Suppliers' system. This request must include the reference to the framework contract to which the catalogue is linked to. This requesting step must not be required for all framework contracts.	NEED 2
FEAT 4.	The system must facilitate the submission of e-Catalogue update requests (i.e. a request for the submission of the e-Catalogue update) to the Suppliers' system. For correlation purposes, this request must include the reference to the framework contract to which the catalogue is linked to. This requesting step must not be required for all framework contracts. This feature is in the same spirit as PRINCIPLE 7.	
FEAT 5.	The format of the e-Catalogue must be rendered into a human readable format which can facilitate its consultation by end-Users.	NEED 3
FEAT 6.	The system must provide a workflow service so that once received the e-Catalogue is automatically routed to a predefined approval workflow. These workflows can be fully automated (i.e. no Human intervention) or semi-automated (i.e. requiring some step(s) Human intervention).	NEED 4
FEAT 7.	The system must provide a multi step approval workflow which enables the approval of the catalogue by several roles of the leading organisation.	
FEAT 8.	In the context of the approval workflow, the system must notify the approver that a catalogue create request or update request requires his/ her approval.	
FEAT 9.	The system must facilitate the browsing of the e-Catalogue. This must be performed in a human readable format.	
FEAT 10.	Following the approval workflow, the system must provide a business response to every catalogue create request and update request submitted by the Supplier.	NEED 5
FEAT 11.	The system must facilitate the use of the e-Catalogue for the creation of requisitions.	NEED 6
FEAT 12.	The system should enable sorting and filtering of the Catalogue content.	
FEAT 13.	The system must facilitate the use of the e-Catalogue for the creation of orders.	
FEAT 14.	The system must acknowledge the receipt of the e-Catalogue once the Supplier submits it.	NEED 7

Feature ID	Description	Need ID
FEAT 15.	The system should ensure that the data is protected against unauthorized reading during the exchange of the e-Catalogue.	
FEAT 16.	The system should ensure that the data exchanged with Suppliers is not changed on its way. It must be possible to detect any changes that may occur.	
FEAT 17.	The system must support the update of the e-Catalogue. For correlation purposes, the e-Catalogue must support a reference to the Catalogue being updated (i.e. at least its ID).	NEED 8
FEAT 18.	At the moment of the update and for contractual reasons, the Catalogue must support a reference to the Contract Amendment.	
FEAT 19.	The system must support the versioning of the Catalogue. For this purpose, the e-Catalogue must at least include the following data: • Catalogue ID; • Issue Date; • Catalogue Version; • Contract reference.	NEED 9
FEAT 20.	The system must support the archiving of each an every version of the e-Catalogue. This is especially relevant as part of the updating process.	
FEAT 21.	The system must enable the automatic comparison of two versions of the same Catalogue.	NEED 10
FEAT 22.	The system must facilitate the use of the e-Catalogue for the creation of requisitions.	NEED 6
FEAT 23.	The system should enable sorting and filtering of the catalogue content.	
FEAT 24.	The system must facilitate the use of the catalogue for the creation of orders.	
FEAT 25.	The system must acknowledge the receipt of the catalogue once the Supplier submits it.	NEED 7
FEAT 26.	The system should ensure that the data is protected against unauthorized reading during the exchange of the e-Catalogue.	
FEAT 27.	The system should ensure that the data exchanged with Suppliers is not changed on its way. It must be possible to detect any changes that may occur.	
FEAT 28.	The system must support the update of the e-Catalogue. For correlation purposes, the e-Catalogue must support a reference to the catalogue being updated (i.e. at least its ID).	NEED 8
FEAT 29.	At the moment of the update and for contractual reasons, the catalogue must support a reference to the Contract Amendment.	
FEAT 30.	The system must support the versioning of the catalogue. For this purpose, the e-Catalogue must at least include the following data: • Catalogue ID; • Issue Date;	NEED 9

Feature ID	Description	Need ID
	• Catalogue Version; • Contract reference.	
FEAT 31.	The system must support the archiving of each an every version of the e-Catalogue. This is especially relevant as part of the updating process.	
FEAT 32.	The system must enable the retrieve of each version of the e-Catalogue.	
FEAT 33.	The system must enable the automatic comparison of two versions of the same catalogue.	NEED 10
FEAT 34.	The e-Catalogue must support multiple Product Categorization (e.g. CPV, eCl@ss, etc) and Identification schemes. The standard product and service classification schemes should at least be available for at least the following three languages: English, French and German.	NEED 11
FEAT 35.	The system must be able to receive large e-Catalogues.	NEED 12
FEAT 36.	The system must allow printing the electronic catalogue.	NEED 13
FEAT 37.	The system must allow customers to search through the electronic catalogue. This search should allow the usage of, at least, the following parameters: • Latest contract amendment version; • Catalogue classification identifier; • Product or service description; • Product or service characteristics.	NEED 14
FEAT 38.	The e-Catalogue must support a reference of the version of the contract to which the catalogue refers to.	NEED 15
FEAT 39.	The system must support and allow visualizing in distinct areas products from the product reference list and products in the supply channel reference list.	NEED 16
FEAT 40.	The system must allow support additional services associated to the products of the catalogue. These services may be maintenance services, installation services, delivery services, etc…	NEED 17
FEAT 41.	The system must enable the storing and making accessible multimedia resources of products of the catalogue. This also includes external resources such as a web-link.	NEED 18
FEAT 42.	The e-Catalogue must enable the complete, accurate and uniform description of the offered products and/or services, prices, etc facilitating their automated processing. Therefore the e-Catalogue must comply with the data requirements in section 5.4.1. The data scheme enclosing these data definitions should be understandable both at the level of the logical concept and also at the level of its applicability. It should equally be based on wimple and wide-spread formats, which can be accommodated through the use of e-Catalogue standards. This feature is in the same spirit as PRINCIPLE 2.	NEED 19

Feature ID	Description	Need ID
FEAT 43.	The system must facilitate the import of well defined catalogues in commonly used formats. In this case the approval process should consider the catalogue as approved.	NEED 20
FEAT 44.	The system must facilitate the export of well defined catalogues in commonly used formats.	
FEAT 45.	The system should include a secured administration console to support activities such as the monitoring of the system, users administration or code tables administration.	
FEAT 46.	The system should control the validity of the e-Catalogue content (including the associated services). This implies that: • The validity period is the one set in the framework contract; • When the catalogue includes associated services there are two validity periods: o A validity period for purchasing the products of the catalogue. This is, as a rule, aligned to the validity of the framework contract; o A validity period for purchasing the associated services to the products of the catalogue (e.g. maintenance services). This is usually longer than the one of the products. • Once the validity period of the product of the e-Catalogue is expired then these products should be marked as no longer valid (i.e. not available for purchasing); • Once the validity period of the associated services of the products of the e-Catalogue is expired then these associated services should be marked as no longer valid (i.e. not available for purchasing). This feature is in the same spirit as PRINCIPLE 6.	NEED 21
FEAT 47.	The system must allow visualizing the additional information linked to the products and/or services of the catalogue.	NEED 22

Table 16 System functional features

3.5.3. Use Case View

Use-Case	Description	Feature
Request Catalogue	Customer requests the catalogue or the update of the catalogue to the Supplier.	FEAT 3 FEAT 4
Submit Catalogue	Supplier submits its e-Catalogue to DIGIT. This includes: • The sending of the business response.	FEAT 1 FEAT 2 FEAT 25 FEAT 26 FEAT 27 FEAT 30 FEAT 34 FEAT 35 FEAT 38 FEAT 42
Submit Catalogue Update	Supplier submits electronic updates of its e-Catalogues to DIGIT. This encloses: • Price update; • Product and/or service specification update; • Full catalogue update; • The sending of the business response.	FEAT 2 FEAT 10 FEAT 25 FEAT 26 FEAT 27 FEAT 28 FEAT 29 FEAT 30 FEAT 34 FEAT 38 FEAT 42
Approve Catalogue	Customer consults the submitted catalogue to approve it. This will enclose: • Creation; • Update.	FEAT 6 FEAT 7 FEAT 8 FEAT 9 FEAT 10 FEAT 32
View Catalogue	Customer consults the catalogue. This will enclose: • Consult specific version of the catalogue.	FEAT 5 FEAT 30 FEAT 36 FEAT 39 FEAT 40 FEAT 41

Use-Case	Description	Feature
Compare Catalogue versions	Customer compares two versions of the catalogue.	FEAT 32 FEAT 33
End-User Query Catalogue	Customer end-user queries the catalogue.	FEAT 37
BackOffice Query Catalogue	Customer Back-Office queries the catalogue.	FEAT 11 FEAT 23 FEAT 24
Export Catalogue	Export of the Catalogue to a commonly used format.	FEAT 42 FEAT 44
Import Catalogue	Import of the Catalogue from a commonly used format.	FEAT 30 FEAT 34 FEAT 38 FEAT 42 FEAT 43
Administrate Catalogue	Administration of framework contracts data, access rights, approval workflows, etc.	FEAT 45
Archive Catalogue	Archiving of the e-Catalogue.	FEAT 31

Table 17 System Use-Cases

3.5.4. Supplementary Requirements

This section lists the non-functional requirements that are not captured in the above use-case model since they are quality attributes of the platform to put in place.

Non-functional Requirements	Related System Features	
	ID	Description
Distribution of data schemes and data definitions	SUPL 1.	The system must facilitate the distribution of the data schemes and data definitions needed by users for accessing its services.
Access to support documentation	SUPL 2.	The system must facilitate the access to support documentation directed to its users/ end-users (e.g. user manual, data dictionary). This feature is in the same spirit as PRINCIPLE 3.
User authentication/ authorisation	SUPL 3.	The system must ensure that the access to a service is preceded by the authorisation and authentication of the User.
Equal treatment, non-discrimination and transparency	SUPL 4.	The system must ensure that all economic operators are treated the same way. For example: the information provided by contracting authorities must be the same for all economic operators. The system must be widely accessible and easily usable offering the grounds for effective competition and should not discriminate or restrict access to the procurement

Non-functional Requirements	Related System Features	
	ID	Description
		procedure. The system must guarantee that the electronic procedures are conducted in a manner that ensures that all processes are transparent and fair. This feature is in the same spirit as PRINCIPLE 2.
Technical interoperability with the external environment	SUPL 5.	The system must be able to function and interact with commonly used equipment and applications. The system should have the capability to exchange information or services directly and satisfactorily between other systems and/or users, so as to operate effectively. This requires the capability to provide interchange of electronic data among, e.g. different signal formats, transmission media, applications or performance levels. This feature is in the same spirit as PRINCIPLE 1.
Technical interoperability with the internal environment	SUPL 6.	The system must render the data received from external applications, in the agreed format(s), to the format accepted by internal applications (a.k.a. back-office applications). Likewise, the system must be able to render data received from internal applications (a.k.a. back-office applications), in the agreed format(s), to the format accepted by external applications. The transformation may involve transformation of data structures, data types or communication protocol metadata. In all cases the integrity of data must be respected. This feature is in the same spirit as PRINCIPLE 1.
Integrity, confidentiality of data	SUPL 7.	The system must guarantee that the information contained in the e-Catalogue is not disclosed to unauthorised parties. When the information is allowed to be disclosed, it must be possible only through action by authorised persons.
Traceability of data	SUPL 8.	Traceability operations of the system should record the exact date and time of receipt of the e-Catalogues and guarantee that no unauthorised access has been detected. As a consequence, the system must: • Provide Suppliers with appropriate information in case the e-Catalogue submission process is not successful; • Send Suppliers acknowledgements receipt for e-Catalogue that is successfully submitted.
Non repudiation	SUPL 9.	The system should provide proof that the Suppliers did send their e-Catalogue and that the CA received the identical e-Catalogue.
	SUPL 10.	The system must log all logons, transactions, checks and other actions. All actions performed by system administrators must equally be logged.
	SUPL 11.	The system must log the full alphanumeric content of the messages exchanged with external parties.

Non-functional Requirements	Related System Features	
	ID	Description
	SUPL 12.	The system must support the retrieval of log entries.
	SUPL 13.	Access to the Logging data must be restricted to administrators and specific security features must be implemented to ensure this.
	SUPL 14.	The system must ensure that log entries are never modified.
	SUPL 15.	The system must keep the log entries for a predefined number of months. This period will start from the log entry registration date.
	SUPL 16.	The system must be able to prove or disprove having previously sent or received data from a particular Supplier (i.e. Supplier cannot repudiate the transaction).
Monitoring of Services	SUPL 17.	The system should support the monitoring of services usage (internal and external), the uptime of services (internal and external), the services performance, services security and technical malfunction within the system. The system should alert the system administrator in case of events such as downtime, performance surge, security violation or technical failure.
Service Level Agreement	SUPL 18.	The services provided by the system must be described and formalized by means of a Service Level Agreement (SLA) so they can be monitored and measured.

Table 18 System supplementary requirements

3.6. Proposed To-Be Business Processes

This chapter will propose a number of changes to the current scenario.

3.6.1. Proposed To-Be Manage Framework Contract Catalogue

The parties involved in the to-be process are the same as in the as-is process but the proposed to-be solution introduces formally 2 new roles in the system that will be in charge of the catalogue management for a leading organisation.

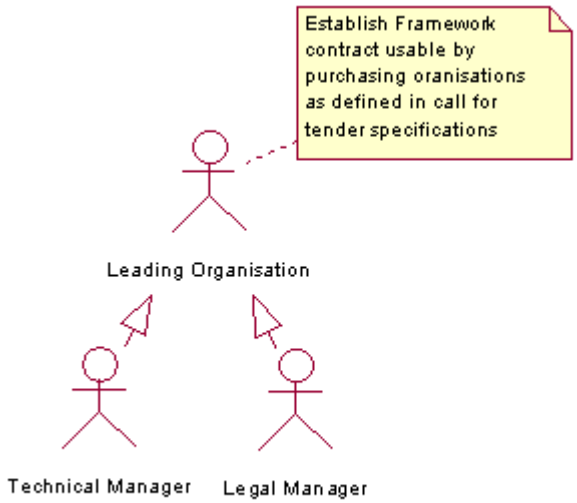

Figure 15 Roles in the system that will be in charge of the catalogue management for a leading organisation

These two actors would follow the harmonised process described in the figure below:

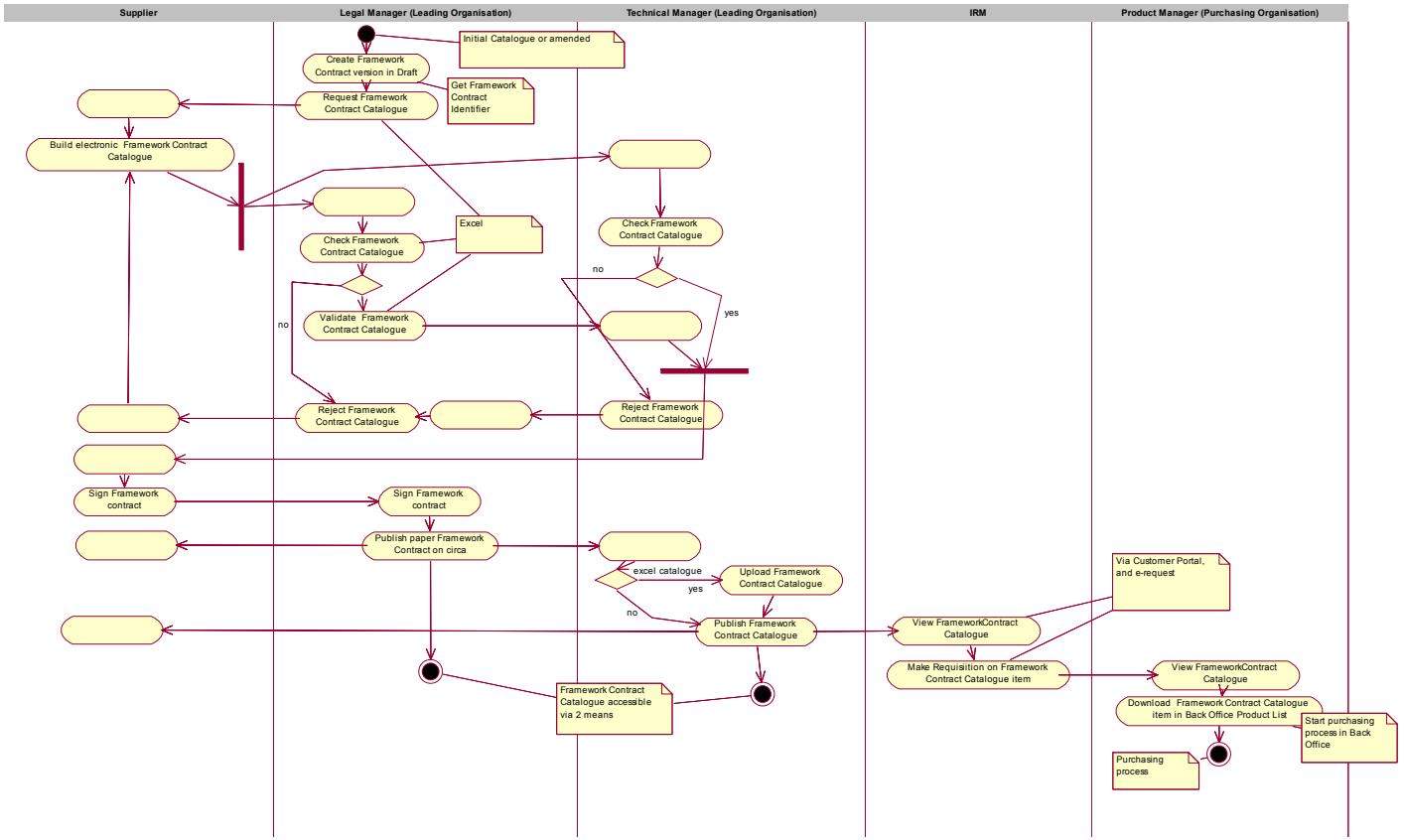

Figure 16 Proposed to-be Manage Framework Contract Catalogue proposed process

The above activity diagram zooms on the catalogue management process and only provides hints of the requisition and the ordering process. It aims at providing the reader with an idea of how the other processes will be impacted by the new management process of the catalogue.

NOTE A new version of the e-Invoicing and e-Ordering Global Implementation Plan (See [REF 17]) and of the e-Request Business Architecture Document (See [REF 18]) will need to be delivered in order to take into account the impacts of e-Catalogue on the purchasing processes.

The proposed to-be process starts after the awarding process has passed and is based on the framework contract business object.

The Legal Manager of the framework contract enters the draft of the contract version into his back-office system and gets an identifier for this framework contract version.

The Legal Manager requests the catalogue information for this framework contract, providing the framework contract draft version. This request can be a standardised electronic request or a text request sent by e-mail.

The Supplier sends the catalogue for this request in an open document format (spreadsheet) when the request was by e-mail or a standard XML document when the request was a standard electronic document.

The Legal Manager and the Technical Manager of the Leading organisation check the catalogue as part of checking the framework contract.

In a transition phase, when the catalogue is approved, the Legal Manager makes a paper version of it and sends it to the Supplier for signature of the framework contract. Once the Supplier has signed both the framework contract text and the catalogue, the Leading organisation signs it, and publishes it on Circa, reproducing the current as-is situation.

Circa notifies all subscribing parties including the Technical Manager.

The Technical Manager publishes the framework contract catalogue by:

- First transforming the spreadsheet file into an XML document, if necessary.
- And adding to the exchanged XML catalogue a reference to the framework contract.

The process has 2 outputs:

- A signed paper framework contract catalogue.
- An electronic approved framework contract catalogue in XML.

The electronic framework contract catalogue can then be accessed by the requesting process and the ordering process via the ‘Manage Back Office Product List’ use case. The back-office can also access the electronic framework contract catalogue in order to automate product and service creation once a framework contract catalogue item has been requested.

The proposed process takes into account the requirements listed in section 3.4.3.

The noticeable advantages of this approach are listed below:

- Optimizing the information flow between the supplier and all actors who need to access catalogue information (IRMs, Leading Organisation Technical Managers, Leading Organisation Legal Managers, purchasing organisations) provide the main noticeable advantages listed below:
- Suppressing duplication of information and thus reducing costs and inconsistencies;
- Limiting data user inputs to data needed for inventory management and thus reducing administrative burden;
- Improving the catalogue data quality through the whole process by automating the exchange of information;

- Improving the time-to-contract and purchasing life-cycle by integrating to purchasing process at corporate level;
- Improving reusability and providing scale of economy by standardising the exchange of framework contract catalogues.

3.6.2. Business Functions Proposed for Automation

This section looks into the business functions affected by the proposed to be scenario. The diagram below depicts main business functions involving catalogue management and where the e-Catalogue project will provide IT tools supporting automation of the business interactions. Business functions are represented by balls and titles summarizing the functionality covered.

The upper diagram describes the interactions leading to publishing the framework contract catalogue or an amendment of the framework contract catalogue.

The lower diagram describes the interactions leading to use the framework contract catalogue in the purchasing process.

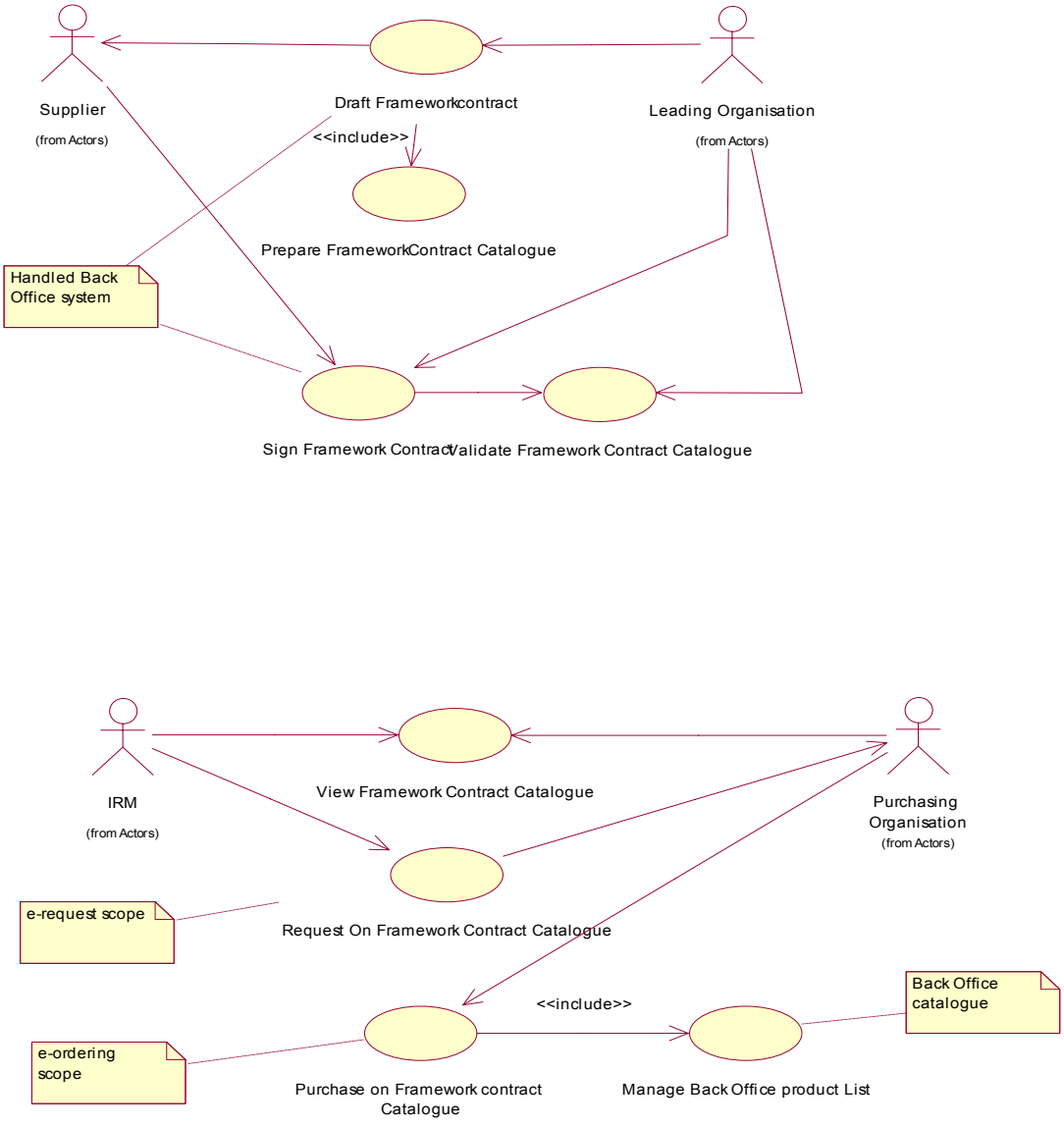

Figure 17 Business functions proposed for automation view of the interacting systems

Business Function Name	Description	Responsible System (see details in §5)
Draft framework contract	The Legal Manager creates a Draft record of the framework contract and get a framework contract unique reference.	ABAC Contracts
Validate framework contract catalogue	The Legal and the Technical Managers approves items list and their prices.	Spreadsheet processing tool
Upload framework contract catalogue	The Technical Manager or the supplier system uploads the validated version of a framework contract Catalogue.	e-PRIOR
View framework contract catalogue	Access the framework contract catalogue of the latest validated version of the catalogue.	e-PRIOR
Manage ordered product list	Maintain the list of ordered products with management properties such as inventory and accounting information.	ABAC Assets
Request product or service	Interface framework contract catalogue with the request for quotation process including Request for quotation and Offer of product or service defined in a framework contract catalogue.	e-Request and e-PRIOR
Order product or service	Interface framework contract catalogue with the e-Ordering process including Orders and Amendments of products or services.	e-Ordering and e-PRIOR

Table 19 Business functions for automation

3.6.3. Impact on Suppliers

Several Suppliers with a contractual relationship with DIGIT (i.e. with at least one framework contract in execution) were contacted to participate in a questionnaire about their experience with regards to e-Catalogue. The following Suppliers accepted an interview with the project team of the Study:

- BT Limited;
- Dell NV/SA;
- Dimension Data Belgium S.A./N.V.;
- Getronics Belgium NV/SA;
- PC-Ware Information Technologies BV;
- Systemat Luxembourg SA.

Around 60% of the interviewed Suppliers have a web-based online catalogue which allows their Customers to consult and order products. The format and content of these catalogues and proposed punch-out mechanisms are heterogeneous. Each Supplier implements its own variant. No common standard exists at content or format level. In most cases, the Supplier is able to customise its web-based online catalogue to the specific requirements of the Customer. In this case, the Customer accesses the web-site of the Supplier and after logging-in it can consult and order from a customised version of the Supplier catalogue which lists the specific products and/or services, and prices of the Customer. Should this not be possible then the Customer can only consult the default catalogue of the Supplier.

At present, nearly all Suppliers exchange their catalogues with DIGIT in electronic format, typically in non-standardised Excel files. This lack of standardisation undermines the automation of the catalogue creation, exchange, validation and publication processes for both the Customer

and the Suppliers. The aforementioned web-based catalogues are above all used during the execution of the framework contract. They enable the Customer (i.e. DIGIT) to consult the Supplier full list of products and/or services which do not appear in the reference catalogue or supply channel list. This facilitates the process of adding and replacing products in these catalogues. As a rule, the update of a catalogue means the exchange of the full catalogue. As already explained in other sections of the Study, this catalogue is exchanged in the process of amending the framework contract. Several draft exchanges may be required before the exchange of the finalised catalogue.

Another common situation is the creation of a specific system to support the execution of the framework contract e.g. FTP exchange of catalogues in the Excel format. In particular when there are many catalogue updates during the life time of the framework contract and when these catalogues are very large.

The proposed to-be processes have a limited impact on Suppliers in the transition phase, as they will continue to provide the catalogue information in spreadsheet files like they now do. As these spreadsheet files format should be standardised, the Supplier may still have to review his extraction process and to adapt it to the new format.

The initial positive impact for Suppliers relies mostly in a faster time-to-contract through facilitating the process of checking the ordered products and/or services, and prices.

A later impact could be to more and more facilitate the generation of the Customer-centric catalogues through the generalized standardisation of nomenclature and formats that will increase the reuse of specifications among framework contracts. This is also where the main effort will be expected from the Supplier, in order to achieve standardisation of the nomenclature used to classify products and/or services.

WRAP UP

The proposed to-be scenario aims at increasing the level of maturity of both the Customer and Suppliers with regards to the adoption of standards, taking into account the current state of play. The longer term scenario foresees that the supplier commits to the automation of the full process of exchange of catalogues and their updates via system to system communication.

Key benefits are listed below:

- Streamlining the Manage Catalogue process automating electronic exchange of the catalogue;
- Suppressing duplication of information;
- Limiting data user inputs to data needed for inventory management;
- Limiting the poor quality of information at low cost in the longer term;
- Improving the time-to-contract and purchasing life-cycle by integrating to purchasing process at corporate level;
- Improving reusability and providing scale of economy by standardising the exchange of framework contract catalogues.

4. CONSTRAINTS

4.1. Implementation Constraints

As already mentioned several times throughout the Study, this project aims at reusing the work of PEPPOL's WP3 (electronic catalogues). The goal of conceiving an e-Catalogue system with a considerable level of interoperability with the PEPPOL project may also be interpreted as an implementation constraint.

The e-Catalogue system must be hosted by the Data Centre of the EC. Therefore the technological solution must be compliant with the guidelines of the EC's Data Centre.

4.2. Interface Constraints

The e-Catalogue system is required to interface with the Information Systems specified in section 3.1.2.3. This will be accomplished using the IDABC's Interoperability Framework guidelines.

4.3. Regulatory Constraints (Legal Requirements, Data Protection)

Regarding the legal context, please see section 3.4. Regarding data protection, e-PRIOR already incorporates the necessary safeguards to ensure compliance with the data protection requirements, please see [REF 7] and [REF 17].

5. TECHNICAL ARCHITECTURE

5.1. Architectural Approach

The selected architecture must provide an implementation solution for all the identified needs and must support all the functional and also the non functional requirements. All of them are described in Chapter 3.4.3.

5.1.1. e-PRIOR

e-PRIOR, the service-oriented platform currently being developed by DIGIT, plays the role of intermediary between the external world and the back-office applications of DIGIT. As such, it already implements all the non-functional requirements of e-Catalogue (see section 3.5.4).

Besides, e-Catalogue will need a close integration with e-Ordering and e-Request, whose document exchange is based on e-PRIOR. Therefore, e-PRIOR was selected for the Pilot as the platform for exchanging e-Catalogue related documents.

This architecture, based on platforming, promotes the re-use of the infrastructure and its e-services. Therefore, the e-Catalogue would benefit out-of-the-box from several features like the security implementation, the message life cycle management, validation services, message storage, services to retrieve a message or its status, inbox services, the possibility to attach documents to a catalogue, support of multiple back-office systems and so on.

5.1.2. Catalogue Document Life Cycle

The e-PRIOR platform can manage the state of an e-Catalogue business document sent by the Supplier (on request of the Customer), the same way it manages the state of invoices and attachments today. This e-Catalogue document will have to be accepted or rejected by the Customer to complete the e-PRIOR workflow. Here is a proposal for the e-PRIOR internal technical workflow.

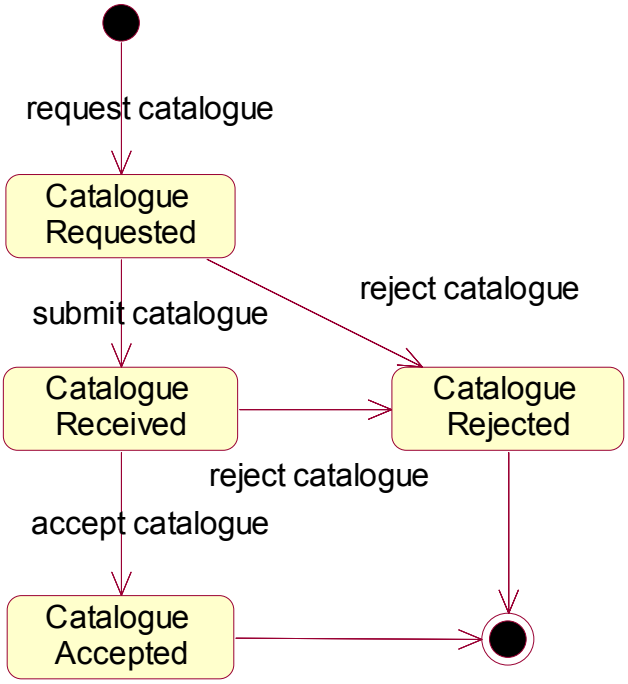

Figure 18 Document exchange workflow for the catalogue submission

Additionally, Suppliers and Customers can decide to update a catalogue. A state machine similar to the previous one can be used for a catalogue update.

5.1.3. Catalogue Validation

Once received by the Customer, the e-Catalogue should be validated both from a technical and business viewpoint. The document validation could be centralized or localized.

A centralized validation can be provided by a graphical user interface (GUI) which could be provided by e-PRIOR or by an external application. The obvious advantage of that centralized interface is that the several local systems, interested in using the e-Catalogue, would not have to implement a validation workflow. Additionally, an implementation in the e-PRIOR application would be easier because the information would be directly available in its relational format, and the e-PRIOR security could be re-used for Customer user's authentication and authorization.

How the customer would locally validate or invalidate a catalogue (accept or reject) would be its responsibility and is not in the scope of the Pilot. However, we can outline three ways to do that:

- An automated workflow that validates electronically the e-Catalogue;
- A manual workflow where a human officer validates the e-Catalogue;
- A hybrid workflow.

5.1.4. Interactions between the System and Suppliers and Customers

The following sequence diagram shows the several interactions when exchanging the e-Catalogue for the purposes of its creation in the Customer system. This involves the Supplier system, the e-PRIOR platform and the Customer system in charge of the catalogue (the back-office).

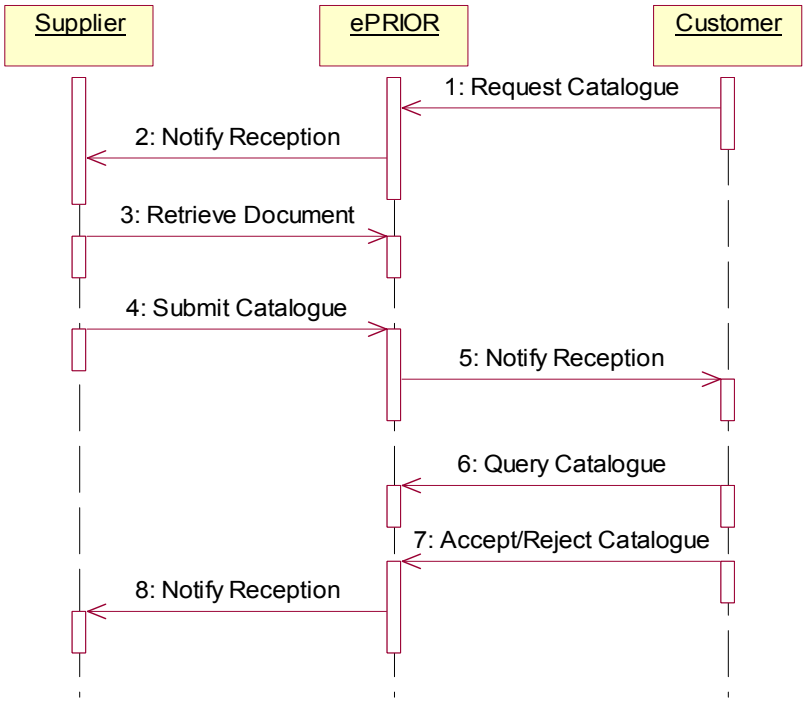

Figure 19 Catalogue creation, interactions between the Supplier system, e-PRIOR and the back-office in charge of the catalogue

When the catalogue is accepted, e-PRIOR has registered an XML document in its database.

The following sequence diagram shows the interactions when exchanging the e-Catalogue for the purposes of its update in the back-office. This involves the Supplier system, the e-PRIOR platform and the back-office in charge of the catalogue.

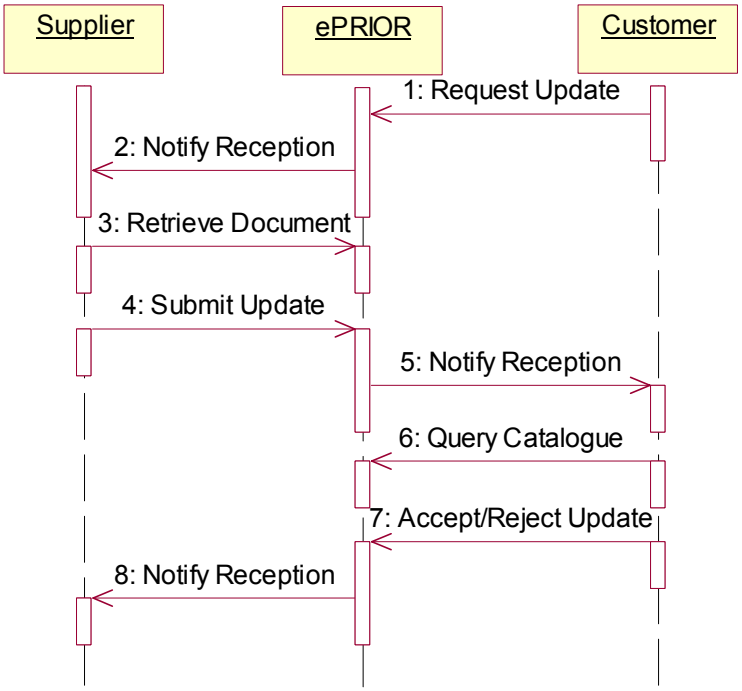

Figure 20 e-Catalogue update following its request by the Customer, interactions between the Supplier system, e-PRIOR and the back-office in charge of the catalogue

The following sequence diagram shows the interactions between the Supplier, e-PRIOR and the back-office when updates are directly sent by the supplier.

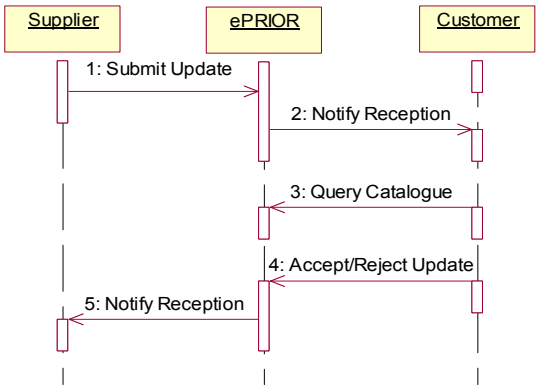

Figure 21 e-Catalogue update, interactions between the Supplier system, e-PRIOR and the Customer system (a.k.a. back-office) in charge of the catalogue

5.1.5. Catalogue Versioning

Sending updates leads to new versions of the catalogue. Based on the initial catalogue and the posted updates, a current version of the e-Catalogue should be computable. In this context, the following two steps are needed:

- e-PRIOR records the catalogue and its related updates;
- e-PRIOR provides a service to retrieve the latest version of a given catalogue. It could also foresee services to retrieve previous versions.

5.1.6. Catalogue Browsing

When a catalogue is in a state 'approved' in e-PRIOR, it should be retrievable by the Leading organisation (approver of the catalogue). But in some cases, that catalogue could be used by other customers. We have different options:

- The back-office of the Leading organisation makes available the e-Catalogue information. That solution decentralizes the e-Catalogue information usage. A drawback is that each Customer could provide its own way to access the data that leads to non standardised solutions;
- e-PRIOR pushes the approved catalogue and updates documents to the granted Customers. The drawback of that solution is that each Customer needs to develop a repository for the catalogue information;
- The Leading organisation grants to the other Customers access to the e-Catalogue. They are now able to retrieve (on demand) the information. That solution provides a centralized and standardised catalogues repository. This granting system implies to store catalogue metadata like these access rights. This is the option selected for the Pilot.

The idea of a centralized repository of catalogues also allows the implementation of business validation rules in the ordering processing. Validation of the order lines level to validate some information related to catalogue items can be foreseen.

To use this complex information, a specific database structure should allow fast querying on the catalogue items. That functionality could also be used by customers to retrieve, on demand, some specific and up-to-date data (latest version of the information) for request or order document creation, to validate a catalogue or to load it locally in a local system.

Such specific database structure would also allow computing quickly and on demand the last version of a given catalogue. Besides, the suppliers will not have to provide an Internet web site with the updated catalogue information for the punch-out mechanism. Suppliers just have to send the catalogue information and e-PRIOR makes them available for Customers.

WRAP UP e-PRIOR is the selected platform for exchanging e-Catalogue related documents. A centralized repository for the catalogue will be added to it in order to:

- Allow a standardised way to access the catalogue data by the customers;
- Provide catalogue versioning support;
- Provide querying functionalities;
- Offer centralized implementation reusable by customer services;
- Avoid the need for the suppliers to provide Internet web site.

NOTE Even if a centralized e-Catalogues repository is adopted, it is important to underline that each Customer local system will have to implement a specific mapping between e-PRIOR e-Catalogue format and product and/or services codes and its local structure/ codes.

5.1.7. Catalogue Import

The formatting of the catalogue by a Supplier, respecting the standardised catalogue content, will be a cumbersome task. It cannot be compared to the equivalent exercise on an invoice document, which has already shown its feasibility during the e-Invoicing Pilot at DIGIT. The Pilot risks to not being a success if this exercise is an obstacle for the Suppliers.

Therefore, to ease the usage of the system during the Pilot, we will foresee an interface compatible with a catalogue template in a spreadsheet open document format. Moreover, the submission of that spreadsheet could be handled by the Customer himself.

NOTE The preferred option is still the calling of the e-PRIOR web services by the Suppliers, with formatted XML documents, which will be available to the Suppliers during the Pilot. The support of the spreadsheet is only aimed at facilitating the embracing of the Pilot by the Suppliers.

So an interface to receive spreadsheets should be available and a mapping between the open document format and the XML format must be realized.

Submitting a catalogue this way does not need any further clarification. However, catalogue updates are trickier on the technical point of view. Three options are possible:

- A spreadsheet containing the new version of the catalogue. This is the easiest solution for Suppliers, but implies to compare the old version to the new one in order to detect changes. This is a resource consuming process, especially for large catalogues;
- A spreadsheet containing the new version of the catalogue with flag indicators to identify new, removed and updated items. This is less easy for the Suppliers because they need to know the changes they apply, but it is easier for the processing because only the changed items are processed;
- A spreadsheet containing only the changes to apply. This approach is a special case of the previous one where unchanged items are not part of the new spreadsheet. It is more complex for a Supplier and easier for a Customer to process that kind of file content.

5.1.8. Catalogue Informal Exchanges

In the normal case of XML catalogue exchanges, the messages are handled by the e-PRIOR security. For the case where spreadsheets are exchanged, an informal channel will be used.

Already today, catalogues are exchanged by e-mail before the formal submission. These exchanges would continue, but with on a secured channel using IDABC PKI infrastructure. See section 5.1.11 for more information on that subject.

5.1.9. Catalogue Documents Size

e-Catalogues and their updates can contain many items. That could lead to an important quantity of information to deal with.

Several options must be considered to handle large e-Catalogue documents sent by Suppliers to e-PRIOR:

- Suppliers could send large documents via the HTTPS protocol. That solution can lead to performance issues and security threats, and is not scalable but is easy to put in place;
- Suppliers could send their documents via secured FTP. That solution is simple to develop, offers good performance but is heavy on the administrative point of view because users and folder structures for each suppliers and/or users must be created;
- Suppliers could send relatively small documents containing a reference to a more important document downloadable on their website via HTTP or FTP protocols. That download can be asynchronous. This solution offers a better scalability but is more complex to develop. It also implies that Suppliers have a website, and could lead to an administrative overhead (to manage security certificates for secured connections for example).

- Suppliers could send the catalogue information as multiple smaller documents (we could limit the maximum document size). The catalogue would stay in a new 'draft' state until all the information is received and then an automatic transition would pass to the state 'received'. This is the selected option for the Pilot. That draft concept can be implemented in different ways:
    - A reference to the initial catalogue document could be added to each supplementary information document;
    - A naming convention for the catalogue parts identifiers could be adopted.

Here is a proposal for that internal technical workflow taking into account a draft state.

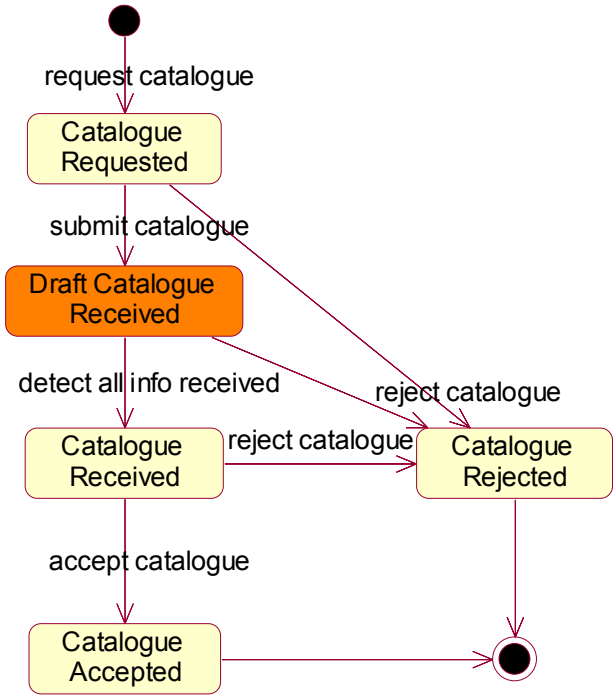

Figure 22 Representation of the e-PRIOR technical workflow taking into account a draft state

To be able to know if all the information is received, the initial document could contain a catalogue header with the total line item count.

We must also consider the sending of catalogue information from e-PRIOR to the back-office(s):

- e-PRIOR could send the information via secured FTP. This solution is more acceptable for Customers because of their limited number. The administrative burden is lower. It allows the sending of a complete catalogue to the customer;
- e-PRIOR could notify the Leading organisation that a catalogue is available for approval and the Leading organisation could use catalogue queries to retrieve the information. These query services could allow the retrieval of catalogue subsets.

Concerning the potential important size of the catalogue information, we must also consider pictures and supplementary technical information on a given item. Two options are available for their implementation:

- Suppliers can send pictures or technical specifications as e-PRIOR attached documents. A link to the initial information should be provided in that document;

- Suppliers can embed directly binary information inside the catalogue documents.

Both options will be supported, but the limited size for documents will encourage the sending of links instead of binary contents.

WRAP UP The catalogues will be exchanged in structured XML format over e-PRIOR. However, in order to make it easier for a Supplier to participate in the Pilot, spreadsheet documents will be accepted, sent via a secured e-mail channel. The upload of such spreadsheet into the central catalogue will be handled by the Customer.

The potential problem of large catalogue size will be handled by the introduction of a draft state for the catalogue, during which subsequent parts can still be submitted.

5.1.10. Information System Overview

Based on the previously listed options, the e-Catalogue implementation should be based on the following choices:

- A central validation interface (e.g. part of the EC DIGIT back-office but with an implementation provided by e-PRIOR);
- Retrieve version services;
- A central repository for catalogues information. That repository will provide services for complex business validation (order, request) and query services for validation and catalogue retrieval. This actually implements an 'internal' punch out mechanism, based on e-PRIOR rather than on the Supplier's system), to create a request or an order;
- The concept of draft state to allow the sending of a catalogue in multiple pieces of limited size (e.g. 5 Mb). As soon as all the pieces are received, the catalogue is set automatically to the state 'received';
- Customer notifications when catalogue information is available. This information will not be sent directly. It will be up to the customer to retrieve the information by querying the central repository;
- e-PRIOR will accept links to external Supplier's site for pictures and supplementary specifications, and will also allow embedding binary contents directly in the catalogue document.

Based on the previous choices, the e-Catalogue system can be represented in the following diagram:

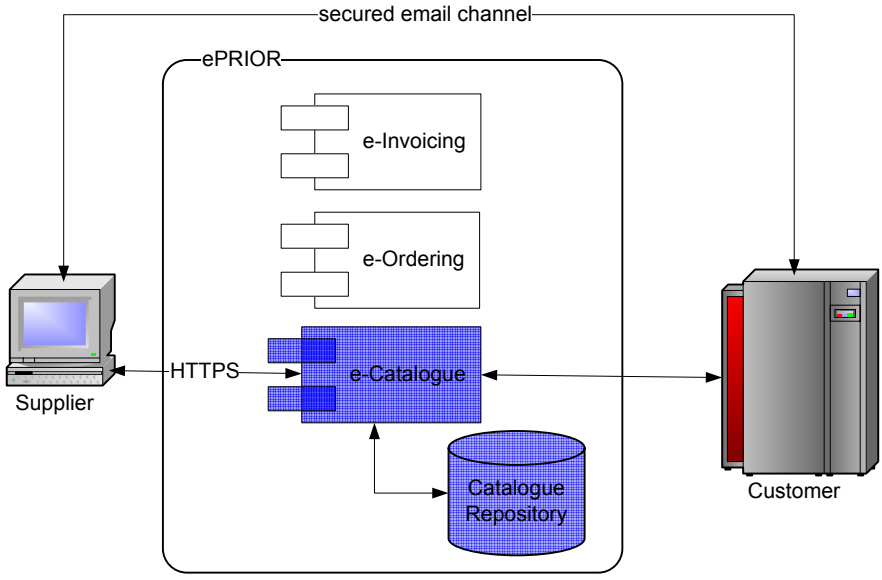

Figure 23 High-level view of the e-Catalogue module with centralised e-Catalogue repository

e-Catalogue functionalities will be implemented on the e-PRIOR platform as a group of electronic services (a.k.a. e-Services) and a catalogue repository. Most of the e-Catalogue services will be implemented as SOAP web services over HTTPS but some of them like the Central Catalogue Manager must be developed as a web application secured via the EC Single Sign-On standard solution (ECAS[9]). That application should provide for catalogues browsing, approval and punch-out features.

Another web interface will also be foreseen to manage some catalogues metadata like the granted users. This interface should also be secured via ECAS and used by the e-Catalogue system administrators.

5.1.11. Security

The majority of e-Catalogue features will be implemented on the e-PRIOR platform and so they will benefit from these out-of-the-box functionalities. Please refer to [REF 7] for more information about e-PRIOR security features.

The e-mail exchange will be realized on a secured channel thanks to the IDABC PKI infrastructure. More information on that security solution can be found in [REF 11] through [REF 14].

Finally, the Central Catalogue Manager will be implemented as a web application accessible by customers authenticated via ECAS.

5.2. Reused Tools from PEPPOL and from Member States

PEPPOL WP 3 on e-Catalogues has announced that a construction phase should release by May 2010 support tools to:

- Set up e-Catalogues template / Receive e-Catalogues (contracting authorities);
- Generate/submit/upload e-Catalogues (economic operators);
- Support activities of converting formats, matching contents and assuring quality of contents.

Unfortunately, for calendar reasons, it will not be possible for this e-Catalogue Pilot to reuse these tools. According to the information received from PEPPOL WP3, the tool which will help Suppliers creating and submitting e-Catalogues should be released by May 2010. However, the contacts between the two projects will be maintained during the preparation of the Pilot in order to potentially test an early version of this tool which would be very useful for the Pilot.

This also reinforces the need for a short-term solution based on spreadsheets: our project should not try to develop those utilities in parallel with PEPPOL. Having this in mind, we will investigate the (partial) reuse of an existing open-source tool which facilitates the conversion between a catalogue in a spreadsheet format and the OIOUBL XML format. Further information has been requested to the Danish team responsible for this tool.

[9] ECAS is the European Commission Authentication Service that enables web applications to authenticate centrally with a common strong password, offering more security than the current LDAP password. It offers also single sign-on between applications using it.

5.3. Logical View

5.3.1. Layers

e-PRIOR uses three software layers. The first one is an integration layer for Suppliers which allow them to discuss with Customers. The second one contains technical workflows to manage message exchanges. It allows message validation and life cycle checks. The last layer is an integration layer with back-offices to allow them sending and receiving messages from the second layer. Integration layers allow a low coupling between suppliers and customers: a web service interface is offered to the Suppliers and their messages are translated into a canonical XML model based on a standard format such as UBL 2.0. The second layer works with that canonical model and it is the responsibility of the third layer to convert that model to something understandable by the Customer. The SOA architecture makes it possible for the Supplier to not have to know the specific format of each Customer.

The following diagram provides the main application packages and their dependencies. The blue packages are external to the e-Catalogue System. This high level view of application packages displays a package for each of the three layers previously discussed and a package containing more generic services like the messages repository and the catalogues repository.

Two packages have been also added to represent the administration console (for metadata management) and the Central Catalogue Manager application which will be referenced and used by Customers back-office systems for catalogues browsing, approval and punch-out functionalities.

Two other back-offices are also represented on that diagram: e-Ordering and e-Request back-office. Indeed, these will use real-time services like the query to a given catalogue, allowing for example to dynamically build a request with references to catalogue items.

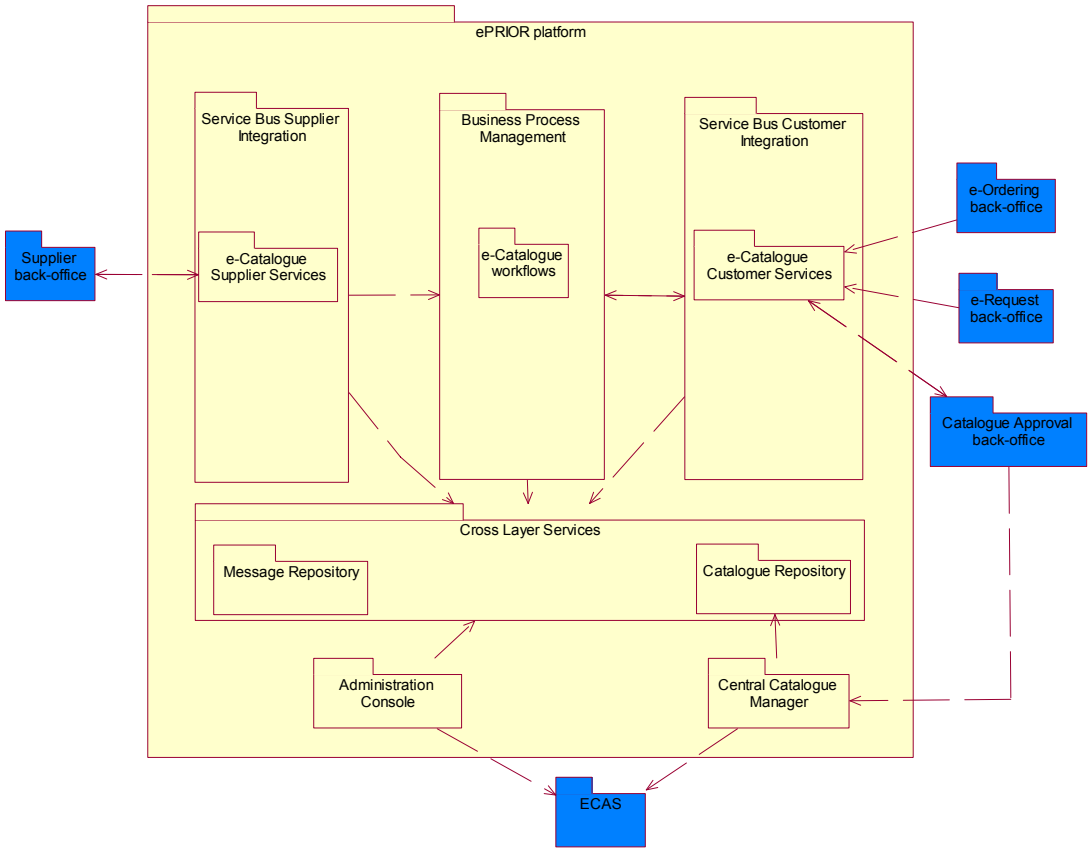

Figure 24 Main application packages of e-PRIOR

5.3.2. Interactions

The following sequence diagram describes the interactions between these software components for the use cases ‘Submit Catalogue’, ‘BackOffice Query Catalogue’ and ‘Approve Catalogue’ described in section 3.5.3 Use Case View.

The Supplier sends three catalogue parts to e-Catalogue services by calling a web service operation called ‘Submit Catalogue’ (only the last call to that service is described on that diagram). In this process, the first layers provide authentication, authorization, validation and transformation to a document in the canonical model. When it detects that the entire catalogue has been received, the canonical document is sent to e-Catalogue workflows component which manages the message persistence and notifies the customer that a catalogue has been received and is waiting for approval. The third layer notifies the customer back-office by using e-Catalogue Customer Services.

The customer can query the catalogue repository to visualize the content of the catalogue and he can approve the catalogue by using the two related services in e-Catalogue Customer Services.

When a catalogue has been approved the workflow layer persists that information and notifies the Supplier.

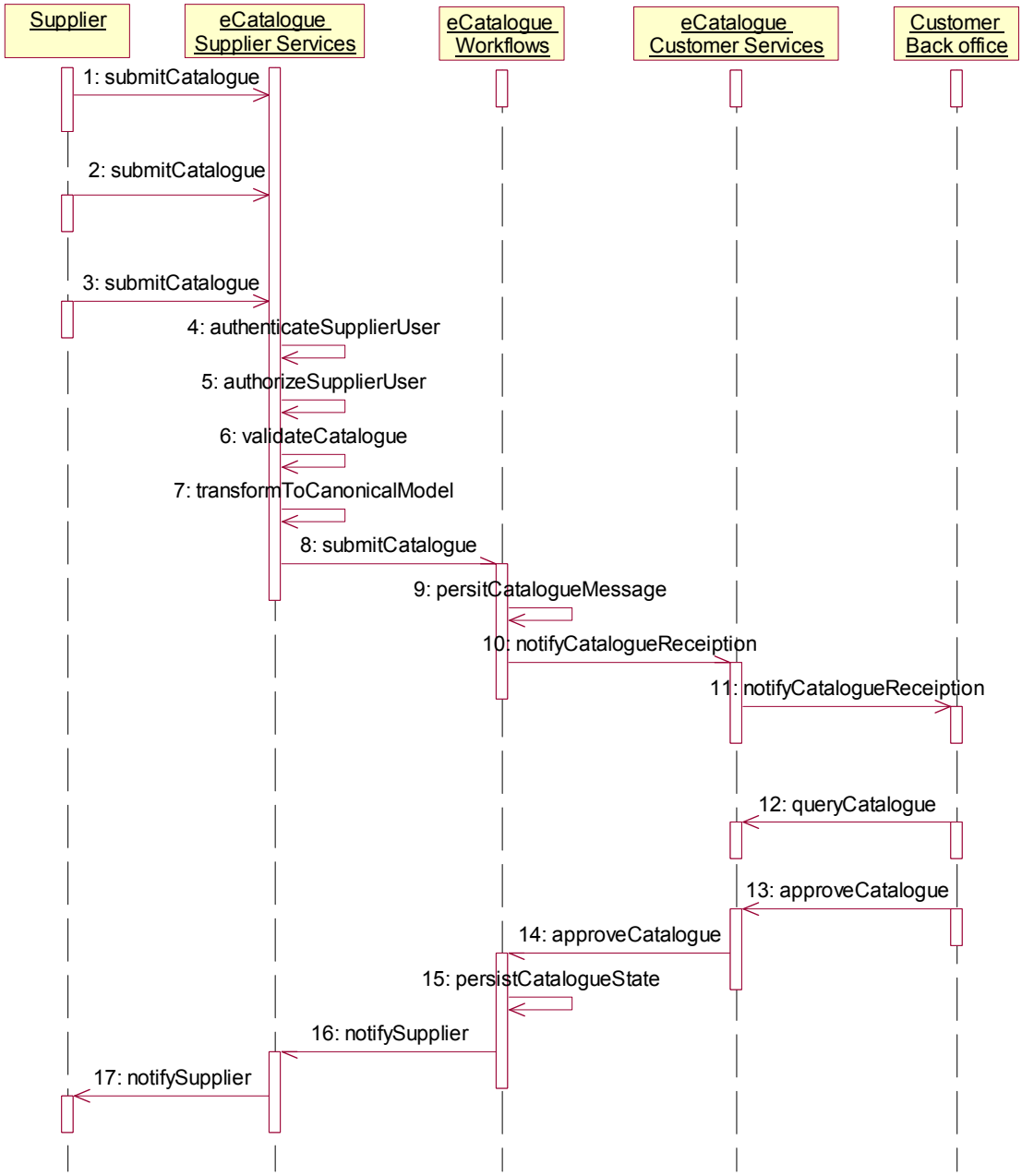

Figure 25 Interactions between software components

5.3.3. Catalogue Import

As mentioned in previous section, a use case 'Import Catalogue' (described in section 3.5.3 Use Case View) will be implemented to allow the Customer, instead of the Supplier, to send to e-Catalogue a catalogue received from the Supplier in open document format.

The following sequence diagram presents that import functionality.

It is in fact – except for the spreadsheet to XML format conversion – a subset of the previous diagram where the 'Submit Catalogue' web service doesn't have to be provided to the Supplier,

and where the concept of draft e-Catalogue doesn't exist. Indeed, the import is done by sending one single spreadsheet file.

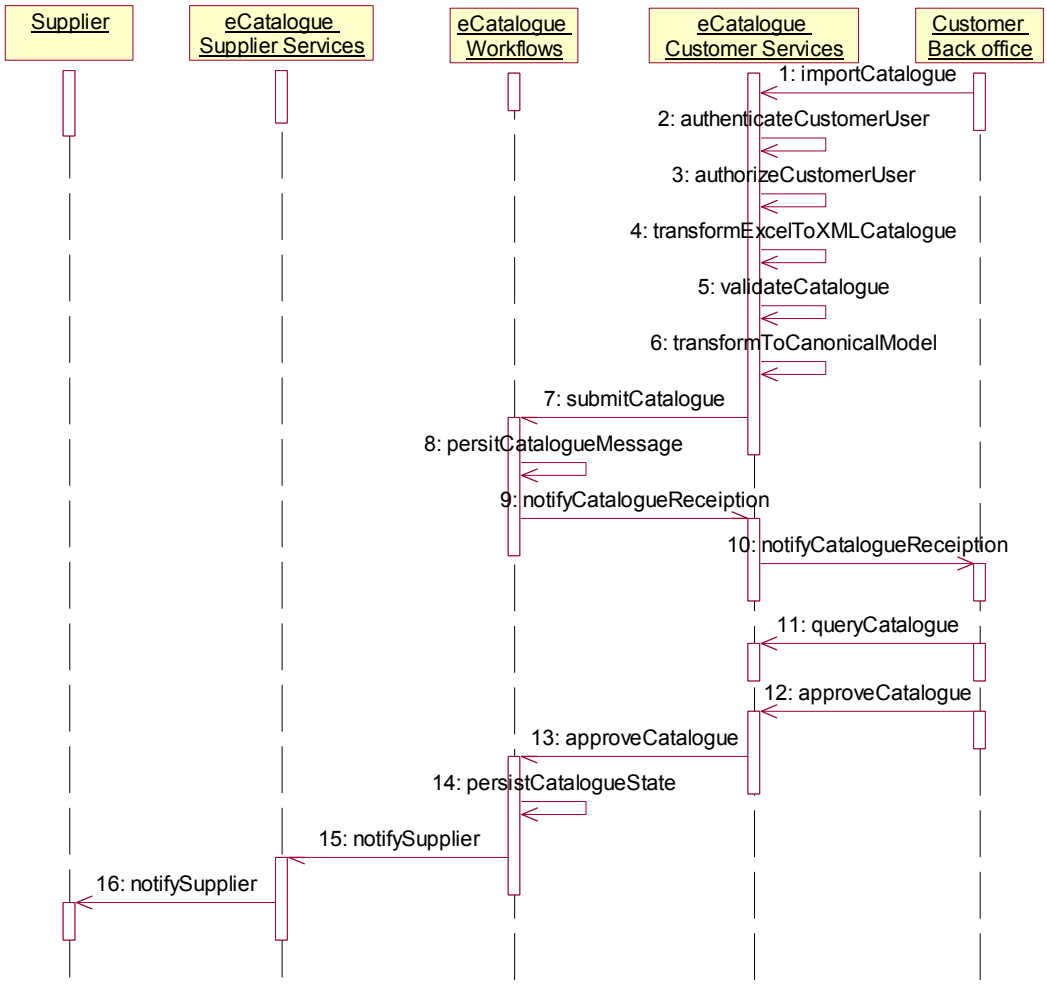

Figure 26 e-Catalogue import function via e-PRIOR,

5.4. Data View

5.4.1. General Characteristics of Well-Formed e-Catalogues

Well-formed e-Catalogue should demonstrate certain characteristics to allow a complete, accurate and uniform description of the offered products and/or services, prices, etc facilitating their automated processing. These characteristics can be generic, regarding the whole e-Catalogue prospectus, and more specific, regarding particular products and/or services, prices within an e-Catalogue.

Following the example of PEPPOL, this project also aims at embracing a common standardisation path through the use of the CEN/ISSS WS/BII work. In the expectation that the CEN/ISSS WS/BII e-Catalogue format will be based on the UBL 2.0 standard, the Project team has verified the required data elements against this standard. In a nutshell, UBL 2.0 caters for the generic characteristics of an e-Catalogue as mentioned in [REF 1]:

- Identification elements of the e-Catalogue:

- Catalogue ID;
- Catalogue Version;
- Contract ID;
- References to a Catalogue ID would be required in the case of update;
- Validity Period.

- Identification elements of trading partners:
  - Supplier Identification;
  - Customer Identification.
- Information on the products and services offered by the supplier, providing information on:
  - Product Description:
    - Name;
    - Model;
    - Brand;
    - Pictures;
    - References to multimedia resources, such as pictures, manuals, multimedia presentations and Internet URL hyperlinks.
  - Product and service identification:
    - Buyer identification scheme;
    - Seller identification scheme;
    - Manufacturer identification scheme (e.g. Name and identification code of the product manufacturer).
  - Product and service categorisation:
    - Class or category of the product according to a classification system e.g. CPV, UNSPSC, etc…
  - Price:
    - Price per unit, applicable taxes, charges and discounts and currency information;
    - For a single item, it should be possible to specify different combinations of prices and quantities;
    - Another widespread situation (at least theoretically possible) is that the time period or the location of delivery influences the pricing. Therefore, the catalogue should allow the creation of time and space dependent prices;
    - Terms of payment.
  - Quantity:
    - Quantity per Unit;
    - Measurement Unit;
    - Minimum / Max Quantity (i.e. Smallest and Largest delivery);
    - Packaging information, physical unit in which the product is sold.
  - Warranty:

        - Warranty information;
        - Validity period.
    - Terms of delivery:
        - Lead time and delivery dates;
        - Stock availability;
        - Delivery addresses;
        - Contact information;
    - Additional information:
        - Free text.
- Additionally, the specifications of an e-Catalogue should be flexible, in order to allow its extension to accommodate custom properties (e.g. extra fields).

UBL 2.0 does not cater for the following information in the catalogue, as mentioned in [REF 1]:

- Invoicing Information (information for issuing invoices in electronic format)

5.4.2. Catalogue Versions Handling

The e-Catalogue versioning can be handled by using the concept of e-Catalogue version set on the e-Catalogue items. The following class diagram provides the description of such versioning system.

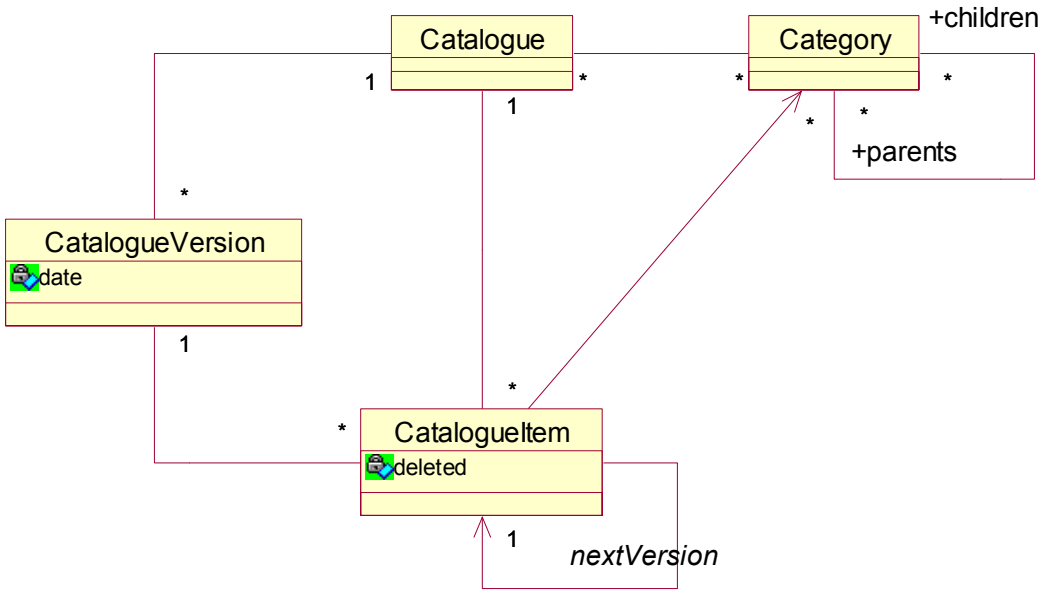

Figure 27 Class diagram of e-Catalogue versioning strategy

An e-Catalogue will contain several items. Each e-Catalogue item may be set as logically deleted and can refer to several categories. Each item must be flagged with one e-Catalogue version. When a new e-Catalogue is received by the system, an e-Catalogue is created and an e-Catalogue item is created for each catalogue item. They are flagged as version 1.

When an e-Catalogue update is received by the system, new e-Catalogue items are created for each items of the update request. If an update on an existing e-Catalogue item is requested, the old catalogue item points to that new version and this one is flagged as version 2.

So when a catalogue in its version 1 is updated to a version 2, one has:

- All unchanged e-Catalogue items are unchanged and still flagged as version 1;
- For all modified items, a new e-Catalogue item is created and flagged as version 2. A pointer is set from the previous version of this item to the new one;
- All new e-Catalogue items are flagged as version 2 only;
- For all the removed items, a new e-Catalogue item is created, flagged as version 2 and set as deleted. A pointer is set from the previous version of this item to the new one.

This information allows generating the different versions of a given catalogue.

5.4.3. Mapping Classification Schemes to CPV

As explicitly prescribed by the EU Directives, contracting authorities may not request specific products, brands, makes, models, technologies, etc. Therefore, in the Terms of reference (ToR), contracting authorities may only describe their needs and draw a picture of preferred high-level solutions and minimum specifications. In such a non-discriminatory environment, economic operators can propose tailor-made solutions according to their expertise and experience.

5.4.3.1. Outline of CPV

The CPV is regulation EC No. 213/2008, amending regulation (EC No 2195/2002), which establishes it as a single classification system applicable to public procurement to standardise the references used by contracting authorities and entities to describe the subject of their contracts. CPV is the only standard product and service classification supporting all official languages of the EU (plus Norwegian and Icelandic). The CPV consists of a main vocabulary for defining the subject of a contract, and a supplementary vocabulary for adding further qualitative information. The Contracting authorities of Public Institutions in Member States are legally obliged to use it for contracts above the EU thresholds set by the directives (EC) n°2004/17 and n°2004/18.

The CPV is used to classify products and services to be procured into a structured hierarchy, through the following vocabularies:

- Main vocabulary: It is tree-structured and contains up to 9-digit codes attributed to a description of the products, services or works reflecting the subject of the contract. Each one of the last three digits provides a more detailed description within the main category. The last digit validates all the previous as shown below:

Figure 28: CPV structure

- Supplementary vocabulary: It is used in order to expand the description of a contract by entering extra qualitative information, such as the destination of the products. This is implemented with the use of a two level alphanumeric code. The first level contains a letter corresponding to a section. The second level contains four digits, three for the identification of a subdivision and the check digit.

The Table below presents the structure, the CPV codes and the corresponding names for the

division, group, class and category of the item ‘Photographic film’.

Structure	CPV Code	Name
Divisions	25000000-1	Rubber, plastic and film products
Groups	25300000-4	Film products
Classes	25320000-0	Cinematographic film
Categories	25321000-7	Photographic film

Table 20: Example of CPV

CPV can be outlined as follows, according to [REF 1] through [REF 4]:

- Classifies products and services to be procured into a structured hierarchy;
- Mandatory use in public procurement notices;
- 4-level hierarchical structure;
- Available in 22 EU languages;
- Buyer-driven and neutral.

DG Market is currently working in close collaboration with PEPPOL to promote the use of CPV as a hub/an entry point in the classification of products in the pre-awarding phase. To take advantage of this work, the e-Catalogue Pilot project could therefore adopt the same approach and required workarounds when applicable.

The CPV is used to standardise the references used by contracting authorities to describe the subject matter of their contracts. The TED database ensures that notices of public tenders subject to European directives are published in the Official Journal 'S' series. Since 20 December 2003, TED has used the CPV codes which became compulsory with the adoption of the revised European directives on public procurement 2004/17 and 2004/18.

However, as previously explained, the classification schemes used in the call for tenders are bespoke. These schemes are optimized to fit the purpose of the contract. To improve interoperability and promote reuse of a standard classification scheme we investigated the feasibility of mapping these legacy classification schemes to the CPV.

5.4.3.2. Need for a Central Classification Scheme

At present, the Customer (i.e. DIGIT) defines tailor-made schemes for each framework contract. Therefore, several Customer-centric classification schemes are used for product description and classification. Due to the absence of a reference classification scheme, the Suppliers need to adapt the content of their catalogues to these tailor-made specifications of the Customer. Then, once the catalogue is received by the Customer it must be manually uploaded in the back-office systems of the Customer. The current situation is depicted in the image below.

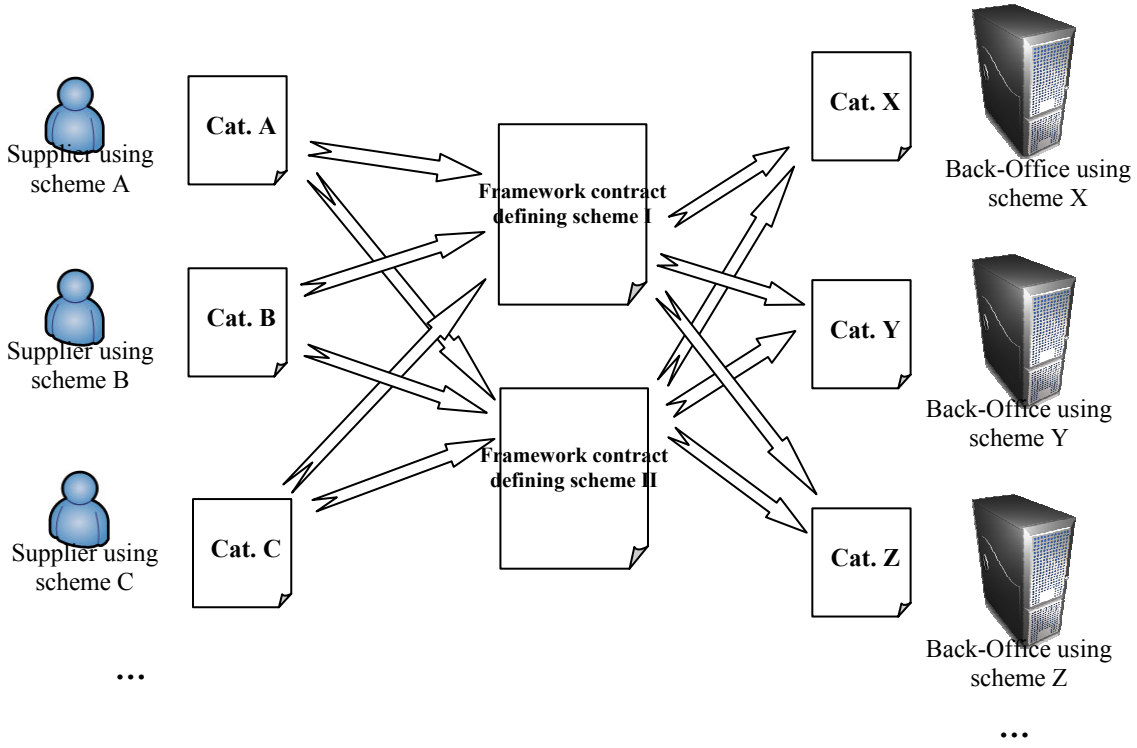

Figure 29 As-is view of the different mappings of catalogues.

The use of a central classification scheme would most likely simplify this process as every scheme should only be mapped to the central scheme, hence ensuring the interoperability of the data and the systems. Furthermore, the current need of Customers for defining tailor-made specifications would be minimised. This approach is visualized below.

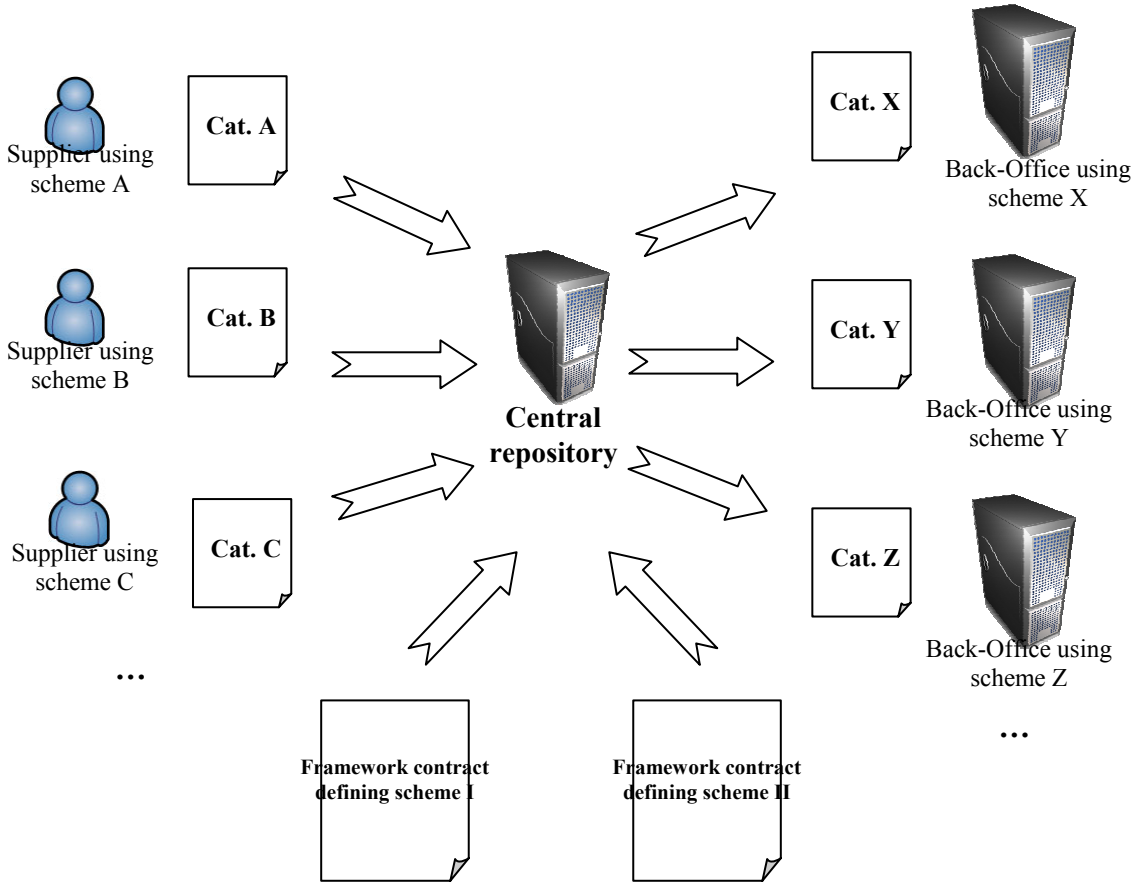

Figure 30 To-be view of the different mappings of catalogues.

The end result of this mapping via the use of a central classification should however remain equivalent to the mappings without the central classification. As a result the central classification scheme must be at least as expressive as the combination of all the target classification schemes. It is however extremely difficult to identify a standardised category for every product and service that satisfies at least a large part of European Public Administrations and provides the necessary data from different perspectives (e.g. data during selection versus installation). We further note that the solution of a central classification scheme to be used in all public procurement procedures would require a huge effort for its creation and maintenance. An alternative to this approach would be to consider existing classification and descriptions systems and provide mappings between them. In the following sections, we verify whether CPV would be a suitable candidate to serve this role.

5.4.3.3. Mapping

Four tenders were selected to be used in the mapping process[10]:

- 2008/032 Mobile Equipment 2009 (MEQ-2009), and
- 2007/017 Desktop PC.
- 2007/007 Network and Communication products via an acquisition channel (NaTacha), and
- 2005/161 Software Acquisition Channel (SACHA)

The results of this mapping can be found in the Appendix 7.2.

[10] The reader may consult the tenders of DIGIT on the following website:

http://ec.europa.eu/dgs/informatics/procurement/calls_closed/index_en.htm

5.4.3.4. Issues

- The CPV constitutes a neutral, customer-driven scheme which allows for competition. As a result, it is less detailed compared to other supplier-driven schemes. Hence, some categories could not be mapped to a corresponding category. The CPV is not a fully embracing and detailed. Therefore these domains should be identified and developed. These categories are then mapped to a general category. E.g. 2.5 – Security Cables/Locks could be mapped to 30237000-9 Parts, accessories and supplies for computers or 35121000-8 Security equipment;
- In the case when a mapping is possible, it is, in many cases, not a one-on-one mapping. Human intervention is therefore required to do the mapping thus making automatic matching difficult. We distinguished the following cases.
    - Some categories are a combination of different categories. E.g. 2.6 - Data Cables / USB hubs / KVM. We can represent this as a combination of the individual categories;
    - Some categories would need extra properties for a one-to-one mapping. E.g. 2.2 - Ergonomical keyboards could be created by adding a detail from the supplementary vocabulary: CA69-7 Ergonomic. However the supplementary vocabulary is incomplete e.g. internal-external are missing;
    - Some categories can be matched to multiple categories as there are overlapping categories. E.g. Personal Digital Assistant (PDA) can match with categories such as 30213100-6 Portable computers, 30213200-7 Tablet computer, 30213500-0 Pocket computers, etc;
    - Although they use the same term, the meaning of categories can differ. E.g. locks for a computer do not match category 44521100-9 Locks under 44000000-0 Construction structures and materials; auxiliary products to construction (except electric apparatus);
    - Some categories are very general e.g. Miscellaneous, Options for PDA Phones. Such categories are mapped to either a very general term such as 30236000-2 Miscellaneous computer equipment or split into different more specific categories such as done for category 1.1.8 – Miscellaneous in Section 2.2.1.
- An item in the CPV does not have a definition, only a name. This is a result of its purpose, which is to describe the subject of procurement contracts. As a result, it does not enable the possibility to do searches based on the specification or on keywords. However, as CPV is available in all official EU languages, its use would avoid the translation effort. Furthermore, categories in CPV do also not have a property list as this level of detail is not needed to satisfy its purpose. Such a list enumerates all properties that could be used to describe products belonging to the respective class and which opens the ability to compare offerings. The property list can also be used to allow the specification of specific requirements on the property values;
- Compared to other classification schemes the CPV is more static. This is a result of the requirement of a legislative initiative by the Commission in the process to make changes to the standard. This may cause problems as new elements might not be made available in a timely manner. The advantage is that re-classification does not happen frequently which might harm the users of the standard;
- Because of the lack of level of details in the CPV nomenclature it should be used with another scheme to improve e-Catalogues usability. As the CPV does not support property lists, it should be linked to classification systems that support this such as eCl@ss.

5.4.4. eCl@ss

eCl@ss is being developed by a European consortium. Products and services are allocated to the four-stage, numeric eCl@ss class structure. PEPPOL is considering using the eCl@ss lists of

properties as a basis for catalogues specification alongside with CPV. PEPPOL aims at contributing to the eCl@ss development by applying change requests in eCl@ss Service Portal to address needs in public procurement.

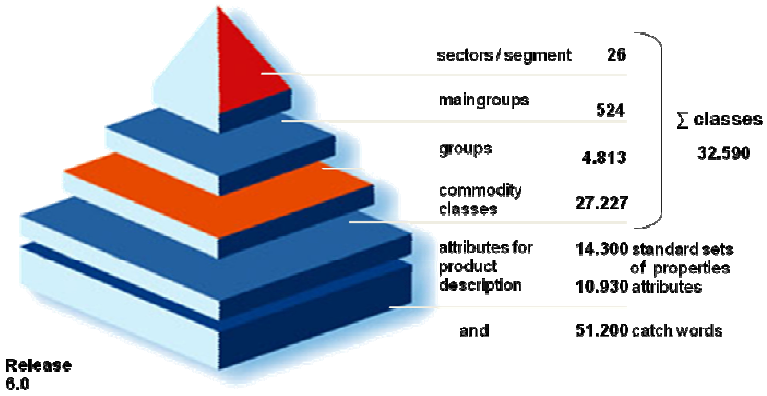

Figure 31 Overview eCl@ss Release 6.0

The following list enumerates some of the most important properties of eCl@ss.

- Supplier-oriented and driven by the market. The eCl@ss Service Portal is an online database for development and maintenance of the eCl@ss classification (free of charge);
- One must purchase a license to download the scheme;
- Not all languages are supported. At the moment only English and German are available for the current release (6.0.1);
- Property lists, keywords, synonyms permit targeted sourcing of products and services within the classification and enable accurate description and subsequent identification of products and services;
- Growing at fast pace: approximately doubled in size from 2003 till 2008, with currently more then 32000 classes and 14000 properties. More than 50% of the level 4 (highest detail) elements already have standard sets of properties for product description. The others have a basic set of properties which can be used to clearly identify the product;
- They are harmonizing with existing schemes (e.g. ECALS, ETIM, proficl@ss, PROLIST) and standards (e.g. DIN, ISO).

5.4.5. Other Strategies

Based on the properties of eCl@ss and the issues identified during the mapping of schemes to the CPV, we considered the possibility of using a combination of CPV and eCl@ss attributes or eCl@ss to serve as standardised classification scheme. The main differences between CPV and eCl@ss originate from the fact that CPV is designed for classification of products whereas eCl@ss is not only designed for classification but also for description of products. In this context, product classification is an instrument to subdivide products in classes of products where products belonging to the same class fulfil similar functions and/or share the same set of attributes. Product description, on the other hand, comprises more detailed information that represents specific characteristics or functions of a product. Product description is implemented by defining class-specific property lists which are then used to describe products belonging to the class. Both types of schemes clearly have different features, and hence the choice for a certain type has an impact.

- Classification scheme:
  - \+ A higher level of detail allows guaranteeing the principles of transparency, equal treatment and non discrimination.
  - \+ It allows for the creation of customer oriented catalogues by naming the respective product classes.
  - \+ Easier to maintain due to its smaller scope.

  - The higher level of detail does not allow for suppliers to define their products in a standardised way. As a result there is no standardised approach to product specification, product comparison and property based searches.
- Description scheme:
  + The high level of detail through property lists opens the ability to compare products, and allows for the specification of specific requirements on the property values.
  + More advanced searches such as property-based searches.
  - Creating and maintaining a standardised description that fits all customers and suppliers in possibly different processes is very difficult and would require a huge effort.
  - Mostly supplier-oriented and therefore its usage may result in possible conflicts with the principles of transparency, equal treatment, and non discrimination.

The following overview lists the different strategies and some considerations.

1. CPV: using CPV as the standard classification scheme and the related issues with this approach was discussed in the previous sections.
   + The EC is in cooperation with EU Member States responsible for the maintenance of the scheme.
   + The CPV is available in all official EU languages and this contributes to cross-border interoperability.
   + The usage of CPV is in accordance with the regulation of the procurement process.
   - It is not strongly being adopted by the private sector as the level of detail does not allow product description.
   - The CPV does not provide, in some cases, the necessary expressiveness for product description due to the level of abstraction and the fact that the CPV only defines a name.
   - For classification, the CPV contains currently approximately 10000 categories whereas other schemes such as eCl@ss for example contains more then 32000 categories.
2. CPV + eCl@ss attributes: using the CPV as a classification system in combination with the attributes of eCl@ss improves the usability for e-Catalogues. The approach is to define descriptions in the form of property lists made of eCl@ss attributes and link these to the categories of the CPV. These attributes then form the description of the class
   + The addition of property lists to the CPV means that all accompanying advantages such as the possibility of product specification, product comparison and property based searches now become available.
   - The combined usage of two standards however entails a greater risk related to change management as a change to any of the standards can now impact the classification scheme.
   - Defining a standardised description that satisfies all customers and suppliers is very difficult and would require a huge effort for its creation and maintenance.
3. eCl@ss: using eCl@ss as a standard classification scheme has the advantage that it is a fast growing classification and description scheme. The main properties of eCl@ss were described in the previous section.
   + eCl@ss reflects comparable technical properties as there is a standard set of properties for more than 50% of the products it describes.
   + The presence of property lists, keywords and synonyms make available the advantages of having product specifications, product comparison and property based searches.
   + Harmonizing with existing schemes and standards.
   - As eCl@ss is a supplier oriented classification scheme driven by the market, and there is a major difference between private and public procurement (e.g. regulation of the

procurement process), there is a need to adapt eCl@ss to address the needs in public procurement.

- The development of eCl@ss is under the control of a consortium of companies instead of the EC.

The need for a standard classification system becomes evident as only if both suppliers and customers commit to the same way of classifying and describing products and services interoperability will be achieved.

In the following overview we consider the issues identified in the previous sections and provide suggested workarounds when following the approach taken by PEPPOL. In this approach, the CPV is used as a hub/an entry point in the classification of products, but attributes of eCl@ss can be added to describe the product in more detail.

Issues and **W**orkarounds	
1	**I:** There is a lack of detail in describing the attributes of the product or service in the CPV supplementary vocabulary.
	W: Detail could be added by specifying attributes of eCl@ss. Furthermore, the CPV is being updated and extended according to the identified needs for public procurement since this is the only need it has to address.
2	**I:** The usage of combinations of categories.
	W: To improve the quality of catalogues, the combined usage of categories should be avoided and instead the separate categories should be used. In the context of the Pilot, it is recommended to split the categories into the CPV unique categories.
3	**I:** Some products can be mapped to multiple categories as there are overlapping categories.
	W: A product will be mapped to the category that best matches the usage of the product. Afterwards consistent usage of this category to classify the product will be needed by the creators of catalogues.
4	**I:** The meaning of a category can be indistinct or ambiguous as the CPV only defines the name of a category.
	W: A long-term goal would be to add a description for each category. Currently, a pragmatic solution is that it remains the responsibility of the users of the classification to identify the meaning by, for example, looking at the parent and/or children of a category. We further note that the CPV ensures uniqueness of the names that are being used.
5	**I:** Categories that are being used can be general.
	W: The quality of a catalogue remains the responsibility of its creator (in public procurement, this happens to be the buyer) as he is accountable for choosing the most specific category to classify a product. However, the usage of general terms in names of categories is removed from the current version of CPV. In the context of the Pilot, the mapping to CPV may mean using a more generic category than the one used in the Call for Tender.
7	**I:** Change to the CPV can not be implemented in a fast manner.
	W: The need of a legislative initiative by the Commission in the process to make changes to the standard cannot be removed. The addition of attributes of eCl@ss can mitigate this issue through the addition of attributes to a more general category.
8	**I:** The CPV is not harmonized with standards defined by ISO, CEN, DIN …
	W: This choice is justified as it allows keeping the level of detail balanced in the CPV, and avoiding dependency on an external party. Due to the harmonization of standards in eCl@ss, some standardised properties may become available via the addition of eCl@ss attributes.
9	**I:** In our setting, the CPV needs to be extended with property lists, however defining a standardised description that satisfies all customers and suppliers is very difficult and would require a huge effort for its creation and maintenance.
	W: Defining standard sets of attributes for products is not part of the Pilot goals. In the

	context of the Pilot, the creation of the sets of attributes remains at the discretion of the users.

Table 21 Issues and Workarounds

WRAP UP Following the example of PEPPOL, this project also aims at embracing a common standardisation path through the use of the CEN/ISSS WS/BII work. In the expectation that the CEN/ISSS WS/BII e-Catalogue format will be based on the UBL 2.0 standard, the Project team has verified the required data elements against this standard. In a nutshell, UBL 2.0 caters for the generic characteristics of an e-Catalogue as mentioned in [REF 1].

Regarding the e-Catalogue versioning, this requirement may be handled by using the concept of e-Catalogue version set on each of the e-Catalogue items.

Regarding the e-Catalogue content, the use of a central classification scheme would most likely simplify the current processes around the creation and upload of the catalogue. In this case, every scheme should only be mapped to the central scheme, hence ensuring the interoperability of the data and the systems. Furthermore, the current need of Customers for defining tailor-made specifications would be minimised. CPV could be used as a hub/an entry point in the classification of products, but attributes of eCl@ss may be required to describe the product in more detail.

6. PLANNING

6.1. Assumptions and Dependencies

The planning and costs given below are subject to the agreement of the stakeholders on the proposed approach, to the availability of the budget, and of the technical environment.

6.2. Pilot Approach

According to the classification system for pilots of CEN/ISSS WS/BII Evaluation Guidelines [REF 10], the Pilot of e-Catalogue is a Proof-of-Concept Pilot. This type of Pilot is used for learning on one or more issues on one or several levels of the EIF 2.0 interoperability framework. Its characteristics are:

- Narrow scope – only one part of a interoperability level in EIF 2.0 is addressed (technical, semantic, process);
- Artificial setup – there's no impact on organizations and its production system when running the interoperability model;
- Still old processes in production;
- Interchange of information is one to one;
- Small number of participants;
- Short lifetime of Pilot (as a rule of thumb, less than 1 month).

Regarding the lifecycle of the Proof of Concept Pilot the following steps will be performed.

Figure 32 Pilot Lifecycle

Pre Pilot: This is mainly the 'Plan' stage, which will be based on the Study.

- A number of Suppliers with a contractual relation with DIGIT will be formally invited to participate in the e-Catalogue Pilot. The Suppliers are free to decide whether or not to accept the invitation. The preferred solution is that the Supplier creates and exchanges an existing Catalogue, linked to an existing framework contract, in a test environment.
- DIGIT will provide the technical specifications of the e-Catalogue services in an Interface Control Document.
- A kick-off meeting will be organised with all participants to explain the schedule of the Pilot and other operational details.

PoC Pilot: This is the 'Do' stage, which includes the execution of the Pilot with Suppliers of DIGIT, and where data is collected for further analysis:

- The Suppliers will prepare and send the catalogue-related messages.
- The project team will support the Suppliers in the execution of the Pilot and will resolve any issue that may occur during the Pilot.
- The project team will collect statistics about the exchanged messages and about the issues.

Post-Pilot: This is the 'Study' stage where conclusions are outlined, and an 'Act' plan is put forward to improve further development and pilots on e-Catalogue. The Pilot should provide the input for answering to the following questions:

Use

- Impact – does the 'good example' Pilot give an incentive for stakeholders to start a project based on the same interoperability model?
- Sustainability - does the product (interoperability model, building blocks) have a future?
- Trust – Does the Pilot create more trust in using e-Procurement?
- Usability of interoperability model – Does the interoperability model work in small scale?

Learning

- Feasibility – Is it possible to build the building blocks for the interoperability model?
- Usability of Governance model – Does the governance model work in small scale?
- Lessons learned – Are the lessons learned and best practice shared with the stakeholders
- Optimizing interoperability model – Are the Pilot experiences used as adjustments to the interoperability model
- Optimizing Governance model – Are the Pilot experiences used as adjustments to the Governance model

Value

- Costs/benefits – Is there a business case for the interoperability model.

6.3. Profiles Rollout

A profile is a technical specification describing: business processes (i.e. a detailed description of the way trading partners intend to play their respective roles, establish business relations and share responsibilities to interact efficiently with the support of their respective information systems), the business rules governing the execution of that business process, possible run-time scenarios and the business commitments achieved, the electronic messages exchanged as part of the business process and the sequence in which these documents are exchanged, the information content of the electronic messages exchanged (data models).

As PEPPOL WP3 agreed the e-Catalogue Profile which will be piloted by the EC will be based on the following two CEN WS/BII Profiles:

- BII 01 Catalogue Only to set up a catalogue;
- BII 02 Catalogue update to maintain an catalogue;

Note Please note that, for the Pilot, an exceptional profile will be available to Suppliers. This profile is called the 'Minimal e-Catalogue Profile' which enables the submission of e-Catalogues using spreadsheets via e-mail. The longer term scenario foresees that the supplier commits to the automation of the full process of exchange of catalogues and their updates via system to system communication. This profile is called the 'Standard e-Catalogue Profile'.

Below is a complete the e-services of the profiles which will be available to the Suppliers participating in the Pilot:

	Minimal e-Catalogue Profile: Spreadsheets via email is acceptable	Standard e-Catalogue Profile: Machine to Machine transactions
Services within the e-Catalogue domain	***Submit Catalogue*** Supplier submits its e-Catalogue to DIGIT. This encloses: • The sending of the business response. ***Submit Catalogue Update*** Supplier submits electronic updates of its catalogue to DIGIT. This encloses: • Price update; • Product specification update; • Full catalogue update; • The sending of the business response.	
Services of Support and Informational character	***Attached Document*** Supplier submits Attached Documents to DIGIT. ***Status Request*** Supplier submits Status Requests to DIGIT. ***Inbox Request*** Supplier submits Inbox Requests to DIGIT. ***Query Request*** Supplier submits Query Requests to DIGIT for documents previously submitted for Processing. ***Retrieve Request*** Supplier submits Retrieve Requests to DIGIT.	
Documents sent by the Customer to the Inbox of the Supplier	***Application Response*** Supplier receives in its Inbox the response to the documents submitted to e-PRIOR. ***Catalogue Request*** Supplier receives in its Inbox the request for the submission of the e-Catalogue.	
Notification Services	***Notification*** Supplier receives notifications from e-PRIOR.	

Table 22 Profile rollout approach

6.4. Pilot Scope

The scope of the Pilot includes:

- Elaboration and Construction phases for adding e-Catalogue functionality to the e-Invoicing and e-Ordering system;
- Pilot with Suppliers, as described in section 6.2;
- Workshop, in order to communicate the results of the Pilot to the e-Procurement community: PEPPOL, e-Procurement Expert Group, CEN,etc;
- Gap-analysis between pre- and post-awarding business requirements for e-Catalogues.

The following elements are considered out of scope:

- Handling of large XML catalogues: The support for large XML catalogues, making necessary the creation a Draft state in the catalogue state machine (see section 5.1.9), will not be part of the Pilot. Note however that this limitation doesn't apply to catalogues exchanged via spreadsheets;
- Mandatory classification: If the exchanged catalogues do not conform to the CPV classification, they will still be accepted by the system. It will be up to the catalogue validator to make sure that they do conform to the bespoke classification of the corresponding framework contract;
- Deployment to production of the developed software: a production phase is envisaged for the e-Catalogue module of e-PRIOR, but it will be funded by a separate administrative budget.

6.5. Timing

In line with the RUP methodology, the approach will be iterative and incremental, allowing to progressively deliver the support of e-Catalogue. There will be a strong relationship with the ongoing development of the e-Ordering module.

The calendar is detailed in the following table.

Start	End	
November 2009	March 2010	**Elaboration and Construction** phases.
April 2010	May 2010	**Pilot** with suppliers.
February 2010	May 2010	**Gap-analysis** between pre- and post-awarding business requirements for e-Catalogues.
	June 2010	**Workshop**

Table 23 Pilot Calendar

6.6. Risks and Mitigation

The following risks were identified during the Study:

Risks	Severity	Mitigation
Conformance of the Suppliers to the message formatting standard might not be achieved.	High	An open document format will be defined, which the Suppliers can use for the duration of the Pilot. A conversion tool will be made available to the Customer, for upload in the central catalogue. The PEPPOL toolset will, in the meantime, propose tools which the Suppliers can use to overcome this obstacle.
Conformance of the Suppliers to the classification standards might not be achieved.	High	The bespoke classification associated to the existing framework contracts of the Pilot Suppliers will be accepted for the duration of the Pilot. Future call for tenders will include more specific requirements regarding the classification to use in the tendering process.

7. APPENDIX

7.1. The OIB Initiative

In order to limit the problem of accessibility of the information and its quality (due to periodical amendments), OIB has taken a different initiative for maintaining catalogue information updated and available.

7.1.1. Maintain OIB catalogue

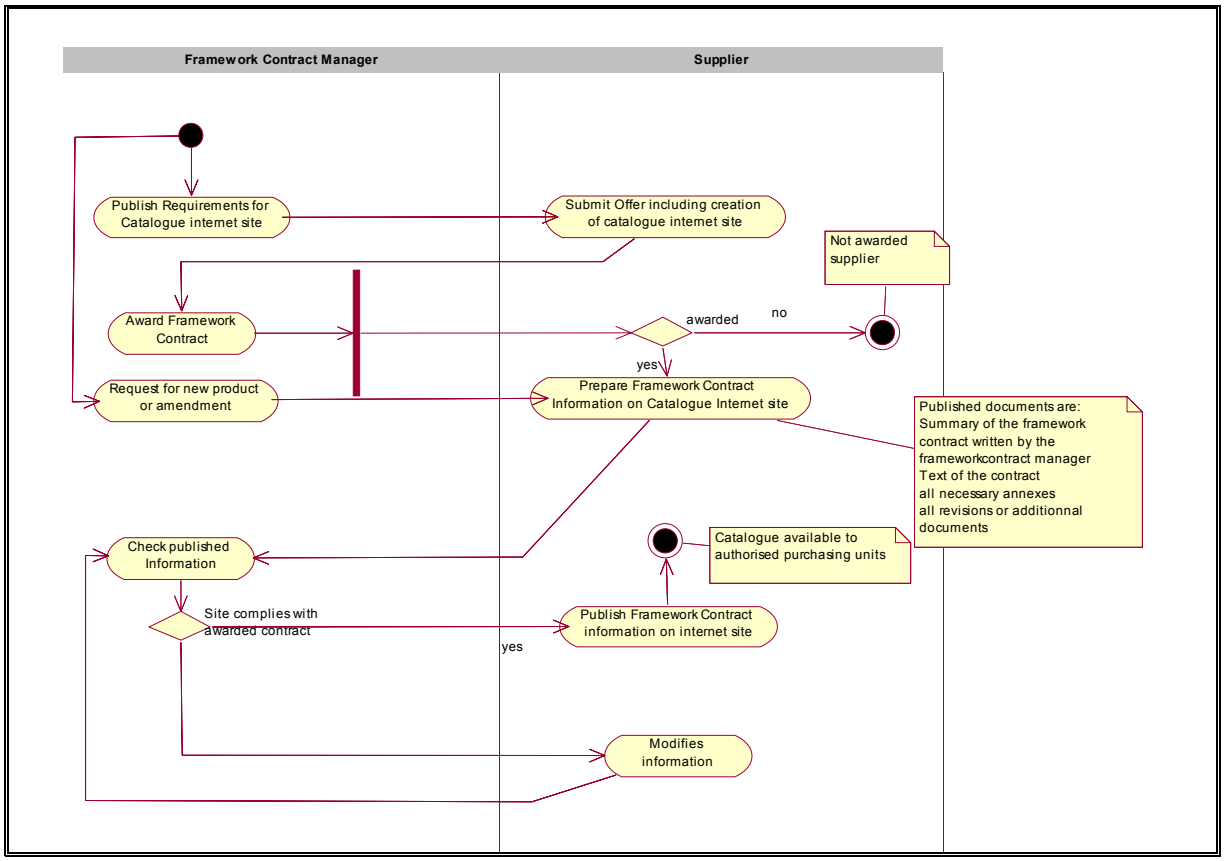

Table 24 OIB Catalogue maintenance

OIB has published call for tenders including providing an internet site for catalogue consultation or updates by admin rights.

Each firm that won the lot has created a site that is tested and validated by the Leading organisation before it is open to users.

Users can then search into these sites to find products and services available to cover their needs.

The sites include the pricing of associated services and the computation of prices for a draft order.

The purchasing organisations must request access to the internet sites of the suppliers (see Maintain user access rights process) and can then check that the orders generated in their back-offices correspond fully with the draft orders proposed by the supplier site.

7.1.2. Maintain user access rights

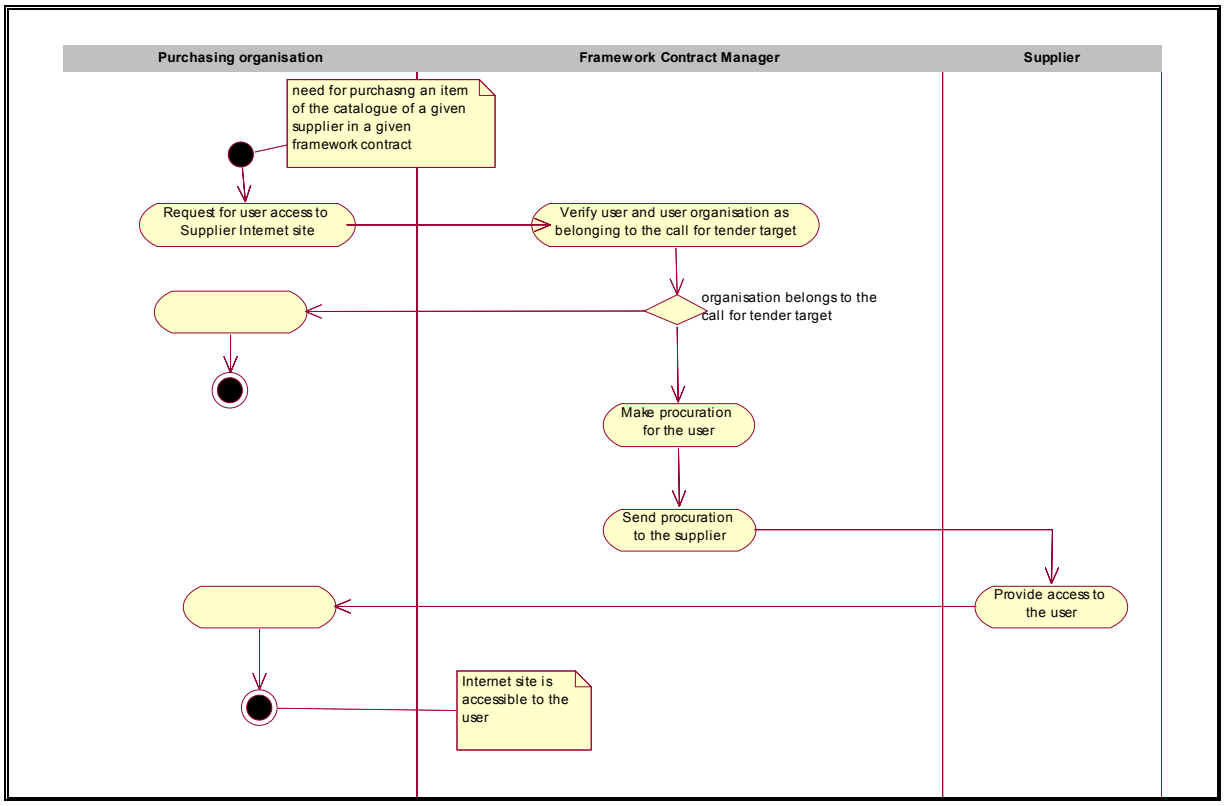

Table 25 OIB maintain User access rights

Security is ensured by a power of attorney provided by the Leading organisation to each local user, and implemented by the supplier.

The pains of this solution are that:

- Purchasing organisations have to navigate on each supplier site.
- Purchasing organisations have to know about supplier sites.
- There is no integration with back-offices so the update of the product list is still time consuming
- There is no harmonisation of the information even though the requirements for specifying the sites have limited the possible heterogeneity.
- User management is duplicated for each new framework contract.

Main advantages of this solution are that:

- There is only one source of information that is updated and validated centrally.
- The updated information is available to every user that needs it.

7.2. Mapping Appendix

7.2.1. 2008/032 Mobile Equipment 2009 (MEQ-2009)

7.2.1.1. List of Mobile Devices

ORIGINAL	CPV CODE	DESCRIPTION
2.1- PDA Phones	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
2.1.1- PDA Phone Models	30200000-1	Computer equipment and supplies
2.1.1.1- PDA Phone Basic	30210000-4	Data-processing machines (hardware)
2.1.1.2- PDA Phone Advanced	30213000-5	Personal computers
	30213100-6	Portable computers
	30213200-7	Tablet computer
	30213500-0	Pocket computers
2.1.2- Options for PDA Phones	31000000-6	Electrical machinery, apparatus, equipment and consumables; lighting
2.1.2.1- Options for PDA Phone Basic	31400000-0	Accumulators, primary cells and primary batteries
2.1.2.2- Options for PDA Phone Advanced	31440000-2	Batteries
(some can be mapped)		
	31000000-6	Electrical machinery, apparatus, equipment and consumables; lighting
	31100000-7	Electric motors, generators and transformers
	31150000-2	Ballasts for discharge lamps or tubes
	31158000-8	Chargers
	31158100-9	Battery chargers
	18000000-9	Clothing, footwear, luggage articles and accessories
	18900000-8	Luggage, saddlery, sacks and bags
	18920000-4	Luggage
	18923000-5	Pouches and wallets
	18923100-6	Pouches
2.2- Barcode Readers	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
2.2.1- Barcode Readers Models	30200000-1	Computer equipment and supplies
2.2.1.1- Barcode Reader Basic	30210000-4	Data-processing machines (hardware)

2.2.1.2- Barcode Reader Advanced	30216000-6	Magnetic or optical readers
	30216130-6	Barcode readers
2.2.2- Options for Barcode Readers	31000000-6	Electrical machinery, apparatus, equipment and consumables; lighting
2.2.2.1- Options for Barcode Reader Basic	31400000-0	Accumulators, primary cells and primary batteries
2.2.2.2- Options for PDA Phone Advanced	31440000-2	Batteries
	31000000-6	Electrical machinery, apparatus, equipment and consumables; lighting
	31100000-7	Electric motors, generators and transformers
	31150000-2	Ballasts for discharge lamps or tubes
	31158000-8	Chargers
	31158100-9	Battery chargers

7.2.2. 2007/017 Desktop PC

7.2.2.1. List of Associated Equipment (Options and Extensions)

ORIGINAL	CPV CODE	DESCRIPTION
1.1.1 - Processor	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
	30200000-1	Computer equipment and supplies
	30210000-4	Data-processing machines (hardware)
	30211000-1	Mainframe computer
	30211500-6	Central processing unit (CPU) or processors
1.1.2 - Memory	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
	30200000-1	Computer equipment and supplies
	30230000-0	Computer related equipment
	30236000-2	Miscellaneous computer equipment
	30236100-3	Memory-expansion equipment
1.1.3 - Disks	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
	30200000-1	Computer equipment and supplies
	30230000-0	Computer related equipment

	30233000-1	Media storage and reader devices
	30233132-5	Hard-disk drives
1.1.4 - Optical Storage	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
	30200000-1	Computer equipment and supplies
	30230000-0	Computer related equipment
	30233000-1	Media storage and reader devices
	30233150-7	Optical-disk drives
1.1.5 - Keyboards	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
	30200000-1	Computer equipment and supplies
	30230000-0	Computer related equipment
	30237000-9	Parts, accessories and supplies for computers
	30237460-1	Computer keyboards
1.1.6 - Graphics Cards	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
	30200000-1	Computer equipment and supplies
	30230000-0	Computer related equipment
	30237000-9	Parts, accessories and supplies for computers
	30237134-7	Graphic accelerator cards
1.1.7 - Miscellaneous interface cards	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
(is network card)	30200000-1	Computer equipment and supplies
	30230000-0	Computer related equipment
	30237000-9	Parts, accessories and supplies for computers
	30237135-4	Network interfaces cards
1.1.8 - Miscellaneous	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
	30200000-1	Computer equipment and supplies
	30230000-0	Computer related equipment
	30236000-2	Miscellaneous computer equipment
However some in 'Miscellaneous' can be mapped:		

smartcard reader	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
	30200000-1	Computer equipment and supplies
	30230000-0	Computer related equipment
	30233000-1	Media storage and reader devices
	30233300-4	Smart card readers
floppy drive	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
	30200000-1	Computer equipment and supplies
	30230000-0	Computer related equipment
	30233000-1	Media storage and reader devices
	30233131-8	Floppy-disk drives

7.2.2.2. List of Computer Accessories

ORIGINAL	CPV CODE	DESCRIPTION
2.1 - Keyboards and Mice	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
	30200000-1	Computer equipment and supplies
	30230000-0	Computer related equipment
	30237000-9	Parts, accessories and supplies for computers
	30237460-1	Computer keyboards
	AND	
	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
	30200000-1	Computer equipment and supplies
	30230000-0	Computer related equipment
	30237000-9	Parts, accessories and supplies for computers
	30237460-1	Computer keyboards
	30237410-6	Computer mouse
2.2 - Ergonomical keyboards and mice	CA69-7	Ergonomic

2.3 - Uninterruptible Power Supplies and Power Protection	31000000-6	Electrical machinery, apparatus, equipment and consumables; lighting
	31100000-7	Electric motors, generators and transformers
	31150000-2	Ballasts for discharge lamps or tubes
	31154000-0	Uninterruptible power supplies
	OR	
	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
	30200000-1	Computer equipment and supplies
	30230000-0	Computer related equipment
	30237000-9	Parts, accessories and supplies for computers
	30237280-5	Power supply accessories
2.4 - USB Storage	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
	30200000-1	Computer equipment and supplies
	30230000-0	Computer related equipment
	30233000-1	Media storage and reader devices
	30233132-5	Hard-disk drives
2.5 - Security Cables / Locks	35000000-4	Security, fire-fighting, police and defence equipment
	35100000-5	Emergency and security equipment
	35120000-1	Surveillance and security systems and devices
	35121000-8	Security equipment
	OR GENERAL	
	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
	30200000-1	Computer equipment and supplies
	30230000-0	Computer related equipment
	30237000-9	Parts, accessories and supplies for computers
2.6 - Data Cables / USB hubs / KVM	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
	30200000-1	Computer equipment and supplies
	30230000-0	Computer related equipment
	30237000-9	Parts, accessories and supplies for computers

2.7 - Additional Displays	30000000-9	Office and computing machinery, equipment and supplies except furniture and software packages
	30200000-1	Computer equipment and supplies
	30230000-0	Computer related equipment
	30231000-7	Computer screens and consoles
	30231300-0	Display screens
2.8 - Loudspeakers, Headphones and Microphones	32000000-3	Radio, television, communication, telecommunication and related equipment
	32300000-6	Television and radio receivers, and sound or video recording or reproducing apparatus
	32340000-8	Microphones and loudspeakers
	32341000-5	Microphones
	32342000-2	Loudspeakers
	32342100-3	Headphones
2.9 - Miscellaneous	SEE COMMENT 1.1.8	

7.2.3. 2007/007 Network and Communication products via an acquisition channel (NaTacha)

ORIGINAL	CPV CODE	DESCRIPTION
5.2. Supply of new networking and telecom equipment	32000000-3	Radio, television, communication, telecommunication and related equipment
	32500000-8	Telecommunications equipment and supplies
	AND	
	32400000-7	Networks
	32420000-3	Network equipment
5.3. Supply of add-ons and upgrades to the equipment already in use	32000000-3	Radio, television, communication, telecommunication and related equipment

	32500000-8	Telecommunications equipment and supplies
	+	JA08-2 Upgrade
	AND	
	32400000-7	Networks
	32420000-3	Network equipment
	32428000-9	Network upgrade
5.4. Maintenance Services	50000000-5	Repair and maintenance services
5.4.2. Guarantee	50300000-8	Repair, maintenance and associated services related to personal computers, office equipment, telecommunications and audio-visual equipment
5.4.3. Basic Maintenance	50330000-7	Maintenance services of telecommunications equipment
5.4.4. Standard Maintenance	AND	
5.4.5. Critical Maintenance	50000000-5	Repair and maintenance services
	50300000-8	Repair, maintenance and associated services related to personal computers, office equipment, telecommunications and audio-visual equipment
	50310000-1	Maintenance and repair of office machinery
	50312300-8	Maintenance and repair of data network equipment
	50312310-1	Maintenance of data network equipment
5.5. Other services associated to the Network and Telecom products	72000000-5	IT services: consulting, software development, Internet and support
(by looking at content: consultancy, training and installation	72200000-7	Software programming and consultancy services
	72220000-3	Systems and technical consultancy services
	AND	
	80000000-4	Education and training services
	80500000-9	Training services
	AND	
	80400000-8	Adult and other education services
	80420000-4	E-learning services

5.6. Maintenance Services associated to the equipment already in use	SEE 5.4

7.2.4. 2005/161 Software Acquisition Channel (SACHA)

ORIGINAL	CPV CODE	DESCRIPTION
1 Product-related services	48000000-8	Software package and information systems
	OR	
	30200000-1	Computer equipment and supplies
NOTE THAT IS REMOVED IN 2008 VERSION	30248200-1	Software licences.
2 General informatics services	72000000-5	IT services: consulting, software development, Internet and support
2.1 Optional licence management services	72000000-5	IT services: consulting, software development, Internet and support
	72500000-0	Computer-related services
	72510000-3	Computer-related management services
2.2 OSS technology consultancy/support	72000000-5	IT services: consulting, software development, Internet and support
	72200000-7	Software programming and consultancy services
	72220000-3	Systems and technical consultancy services
	72253000-3	Helpdesk and support services
	72261000-2	Software support services
	72266000-7	Software consultancy services
	AND	
	50000000-5	Repair and maintenance services
	50300000-8	Repair, maintenance and associated services related to personal computers, office equipment, telecommunications and audio-visual equipment

50310000-1	Maintenance and repair of office machinery
50312000-5	Maintenance and repair of computer equipment

8. ABBREVIATIONS AND TERMS

The table below provides the reader with an overview of the abbreviations used relevant to the project.

Abbreviation	Description
CEAF	Commission Enterprise Architecture Framework http://ec.europa.eu/dgs/informatics/ecomm/doc/ceaf_guide_v1_1.pdf
CEN/ISSS	The European Committee for Standardisation http://www.cen.eu/cenorm/businessdomains/businessdomains/isss/index.asp
CEN/ISSS WS/BII	Workshop on 'Business Interoperability Interfaces on public procurement in Europe' http://www.cen.eu/cenorm/sectors/sectors/isss/activity/ws_bii.asp
CIP	Competitiveness and Innovation Programme http://ec.europa.eu/cip/index_en.htm
CPV	Common Procurement Vocabulary http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:074:0001:0375:EN:PDF
DIGIT	Informatics DG http://ec.europa.eu/dgs/informatics/index_en.htm
DPS	Dynamic Purchasing System
EC	European Commission http://ec.europa.eu/index_en.htm
e-PRIOR	electronic PRocurement, Invoicing and Ordering http://www.epractice.eu/cases/ePRIOR
EU	European Union http://europa.eu/
FC	Framework Contract
ICT	Information and Communication Technology
IDABC	Interoperable Delivery of European eGovernment Services to public Administrations, Businesses and Citizens http://ec.europa.eu/idabc/
IRM	Information Resource Manager
JRC	Joint Research Centre http://ec.europa.eu/dgs/jrc/index.cfm
MARKT	Internal Market and Services DG http://ec.europa.eu/dgs/internal_market/index_en.htm
OIB	Office for Infrastructures and Logistics in Brussels http://ec.europa.eu/oib/index_en.htm
OIOUBL	The Danish customisation of UBL 2.0 http://www.oioubl.info
PEGSCO	Pan-European eGovernment Services Committee

Abbreviation	Description
PEPPOL	Pan-European Public eProcurement On-Line http://www.peppol.eu/About_PEPPOL
RFP	Request for Proposal
RUP	Rational Unified Process
UN/CEFACT	United Nations Centre for Trade Facilitation and Electronic Business http://www.unece.org/cefact/
UNSCPS	The United Nations Standard Products and Services Code http://www.unspsc.org/
WP	Work Package

The glossary below provides the reader with an overview of the terms used relevant to the project. The reader may also consult [REF 20] for additional technology terms and acronyms.

Abbreviation	Description
Tender Documents	Set of documents presented by the contracting authority to economic operators to enable them to submit offers (includes tender specifications and invitation to tender).
Stakeholder Need	The business or operational problem (opportunity) that must be fulfilled in order to justify purchase or use. Also known as goal or objective.
Stakeholder	A stakeholder is defined as anyone who is materially affected by the outcome of the project. Effectively solving any complex problem involves satisfying the needs of a diverse group of stakeholders. Stakeholders will typically have different perspectives on the problem, and different needs that must be addressed by the solution.
Specific Contract or Order Form	Contracts specifying the details of a particular task based on a previously signed framework contract.
Public Procurement	'Public procurement' means the purchasing of works, supplies and services by public bodies at either national or Community level.
Interoperability	According to IDABC, interoperability means the ability of information and communication technology (ICT) systems, as well as, of the business processes they support in order to exchange data and enable the sharing of information and knowledge. http://ec.europa.eu/idabc/en/chapter/5883
Framework Contract	In contrast to direct contracts, framework contracts merely set out a performance framework (in general, the characteristics and price of the goods or services that the contractor is prepared to provide). The other basic elements of the contractual relationship are defined at a later stage in a specific contract, which is often an 'order form' indicating the quantities and date of performance.
Feature	A capability or characteristic of a system that directly fulfils a Stakeholder Need. Often thought of as the 'advertised benefits' of the system.
Direct Contract	In direct contracts the subject, remuneration and length of implementation of the contract are defined at the outset. As such, they are definitive and self-sufficient in that the contract can be implemented without further formalities.
Contract	- framework contract: contract establishing only the general outline of the services or goods to be delivered and requiring an additional step to make the

Abbreviation	Description
	actual purchase. - specific contract or order form: contract specifying details of a particular task based on the previously signed framework contract.
Candidate Supplier	Any economic operator who submits a request to participate in a two-step procedure (restricted, negotiated or competitive dialogue).
Dynamic Purchasing System	The dynamic purchasing system is a completely electronic process for commonly used purchases, which is open throughout its duration to any economic operator who satisfies the selection criteria and has submitted an indicative tender that complies with the specification and any additional documents. The indicative tenders may be improved at any time provided that they continue to comply with the specification.

9. REFERENCES

Reference	Document
[REF 1]	DG-MARKT Study 'Electronic Catalogues in Electronic Public Procurement' **State of Play**: the current report, presenting eCatalogue initiatives in the public sector in the EU and in private companies, highlighting common points, differences, needs and requirements. http://ec.europa.eu/internal_market/publicprocurement/e-procurement_en.htm
[REF 2]	DG-MARKT Study 'Electronic Catalogues in Electronic Public Procurement' **Standardisation Activities**: presents current standardisation activities on eCatalogues as well as product description and classification schemes, and makes recommendations for the adoption of appropriate standards to increase interoperability. http://ec.europa.eu/internal_market/publicprocurement/e-procurement_en.htm
[REF 3]	DG-MARKT Study 'Electronic Catalogues in Electronic Public Procurement' **Functional Requirements**: defines preliminary functional and non-functional requirements for establishing eProcurement systems which may use eCatalogues as a tool for tender submission. http://ec.europa.eu/internal_market/publicprocurement/e-procurement_en.htm
[REF 4]	DG-MARKT Study 'Electronic Catalogues in Electronic Public Procurement' **Executive Summary:** Summary of the main findings of the three project reports. http://ec.europa.eu/internal_market/publicprocurement/e-procurement_en.htm
[REF 5]	PEPPOL Deliverable D3.1 Functional, Technical, legal and organisational specifications for the development of Building Blocks Software enabling cross-border use of eCatalogues http://www.peppol.eu/deliverables/wp-3/functional-technical-legal-and-organisational-specifications-for-the-development-of-building-blocks-software-enabling-cross-border-use-of-ecatalogues/view
[REF 6]	COMMISSION REGULATION (EC) No 213/2008 of 28 November 2007 This document is the Amending Regulation (EC) No 2195/2002 of the European Parliament and of the Council on the Common Procurement Vocabulary (CPV) and Directives 2004/17/EC and 2004/18/EC of the European Parliament and of the Council on public procurement procedures, as regards the revision of the CPV. http://ec.europa.eu/internal_market/publicprocurement/legislation_en.htm

[REF 7]	e-PRIOR Interface Control Document (ICD) This document provides the detailed specification of the interface of e-PRIOR. The e-PRIOR ICD is online on the CIRCA website (http://circa.europa.eu/). Access is provided following a request to DIGIT via an email to the following address: DIGIT-EPRIOR-SUPPORT@ec.europa.eu
[REF 8]	European Interoperability Framework version 1 and basis for version 2 The European Commission has started drafting the EIF v2.0 in close cooperation with the concerned Commission services and with the Members States as well as with the Candidate Countries and EEA Countries as observers. The proposal for the new EIF v2.0 that has been subject to consultation, is available online: http://ec.europa.eu/idabc/servlets/Doc?id=31597
[REF 9]	European Commission Vade-mecum on public procurement procedures, March 2008 This Vade-mecum on public procurement procedures in the Commission has been produced for internal use. The aim is to provide contracting authorities in the Commission with practical assistance in preparing and implementing these procedures.
[REF 10]	CWA_CEN_ISSS_BII_Part 4_Annex B_Evaluation Guidelines version.pdf This Report was developed in cooperation between PEPPOL and CEN ISSS WS/BII WG 4, and is aligned with the PEPPOL report '20090430 - PEPPOL WP 5 Deliverable 1b'. http://www.cen.eu/cenorm/sectors/sectors/isss/activity/ws_bii.asp
[REF 11]	Certification services for electronic security certificates (Certification Practice Statement), CPS_SC_01 of 18/05/2006 by Postecom. Postecom's Certification Practice Statement for the issue and management of Electronic Security Certificates. http://circa.europa.eu/Members/irc/ida/certserv/library?l=/idabc_generic_pki/documents/setting_the_cug/cpspdf/_EN_1.0_&a=d
[REF 12]	Agreement with reference to the European Commission Framework Contract no ENTR/04/28-PKI III of 03/10/2006 by Postecom.

	Requirements to be complied with by LRAs and LRAOs in issuing Electronic Certificates (not qualified) http://circa.europa.eu/Members/irc/ida/certserv/library?l=/idabc_generic_pki/documents/setting_the_cug/genericcug_220906zip/_EN_1.0_&a=d
[REF 13]	Lightweight Certificate Policy for the European Commission – IDABC Closed User Groups of 03/10/2006 by Postecom. Description of the applicability of the certificates, of the procedures to follow and of the responsibilities of the parties involved. http://circa.europa.eu/Members/irc/ida/certserv/library?l=/idabc_generic_pki/documents/setting_the_cug/genericcug_220906zip/_EN_1.0_&a=d
[REF 14]	IDABC PKI website http://ec.europa.eu/idabc/en/document/2316/5644
[REF 15]	The i2010 eGovernment Action Plan is available at: http://ec.europa.eu/transparency/archival_policy/docs/moreq/action_plan_i2010_en.pdf
[REF 16]	The case of e-PRIOR is available at: http://www.epractice.eu/en/cases/eprior
[REF 17]	The e-Invoicing and e-Ordering Global Implementation Plan available at: http://circa.europa.eu/Members/irc/ida/pegsco/library?l=/meetings_technical/2008-02-19/e-invoicing_e-orderingpd/_EN_1.0_&a=d
[REF 18]	The e-Request Business Architecture Document *CLASSIFIED*
[REF 19]	Action Plan on electronic public procurement This Action Plan launched by DG Internal Market and Services in January 2005 with the aim of providing guidance and organising a smooth transition towards e-procurement in the Member States: COM(2004) 841; Legal framework for e-Procurement from directives 2004/18/EC and 2004/17/EC
[REF 20]	IDABC Glossary The link below provides a glossary of the technology terms and acronyms used in the IDABC website: http://ec.europa.eu/idabc/en/chapter/5892
[REF 21]	Directive 2004/18/Ec Of The European Parliament And Of The Council of 31 March 2004 on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts

	Official Journal L 134 , 30/04/2004 P. 0114 - 0240 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32004L0018:EN:HTML
[REF 22]	Public Procurement Legislation Package http://ec.europa.eu/internal_market/publicprocurement/legislation_en.htm This website contains information about: • Current Directives (Legislative Package); • Current Directives (Legislative package) –Implementation; • Previous Directives; • Directives on remedies; • Standard Forms Directive and CPV regulations.
[REF 23]	Under http://ec.europa.eu/dgs/informatics/procurement/calls_running/index_en.htm Choose one Call for tender Tendering specifications.zip Search for GTC document "III. GENERAL TERMS AND CONDITIONS FOR INFORMATION TECHNOLOGIES CONTRACTS"