

# ELECTRONIC CATALOGUES IN ELECTRONIC PUBLIC PROCUREMENT

**Final Report**

**Executive Summary**

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## Executive summary

The new EU legislative framework of public procurement Directives 2004/17/EC and 2004/18/EC, adopted in 2004, introduces for the first time a coherent and comprehensive framework for the use of electronic public procurement in the EU. Amongst its most innovative provisions, it authorises the use of electronic catalogues (eCatalogues) as a tool for the electronic submission of tenders. In line with its Action Plan for eProcurement, also adopted in 2004, the European Commission commissioned this Study to analyse rules and current practices for the use of eCatalogues in both the public and the private sectors, with a view to formulating requirements and recommendations for their further development in public procurement.

### **Background of the study**

eCatalogues are electronic documents established by suppliers which describe products and prices. They emerge as a cost-effective tool for both buyers and suppliers which is expected to help streamlining the purchasing process. According to the EU public procurement directives, they may, under certain conditions, constitute a tender in a public procurement procedure; to this end they are either transmitted to or uploaded on the contracting authority's website or made available in the suppliers' website.

In order to ensure that eCatalogues can be accepted as valid tenders, both contracting authorities and economic operators must comply with the general and specific legal and functional requirements of the EU public procurement Directives. However, whilst the Directives state that tenders submitted electronically may take the form of an electronic catalogue, they do not further define the notion of an eCatalogue itself.

Agreement on certain minimum functional requirements and standards could be expected to remedy the risk of ICT applications on the market not meeting the requirements of the public sector and of barriers to the Internal Market, and increase both public buyers' and businesses' trust in the new electronic procedures, systems and tools. The central tenet of this approach is not to drive a wedge between developments in the public sector and the private sector; eCatalogues suitable to be used as valid offers in a public procurement procedure should be used in, and be interoperable with those used in a standard electronic commerce environment.

### **Objectives of the study**

- To define the notion of eCatalogues and study their current use in procurement practices, both in the public and private sectors.
- To identify the general and specific functional requirements that can be derived from the new legal framework, so as to specify in greater detail the conditions under which eCatalogues may constitute a valid offer in an electronic public procurement procedure, whilst preserving interoperability with eCatalogue applications in general use.
- To review relevant standardisation activities with a view to identify advancements, gaps and areas for future work.
- To define recommendations for Member States, Standardisation Bodies and the European Commission on actions and activities that can contribute to the more efficient and beneficial use of eCatalogues in European public procurement.

### **Scope of the study**

The study reviews all relevant aspects of how eCatalogues can be used in the tendering process, as well as specific requirements relating to their electronic submission and receipt in public procurement and, investigates the relevant data exchanges between buyers and suppliers (e.g. type and content of messages exchanged).

The study on legal aspects primarily entails the analysis of the two main EU Directives on public procurement (2004/17/EC and 2004/18/EC), while all legal and functional requirements identified relate to public procurement procedures which fall within their scope.

Analysis on organisational and technical aspects is based on practices and systems from both the public and private sectors. In particular for the public sector, apart from detailed information on selected European countries, resulting to a number of “country sheets”, the scope of work includes an additional investigation on specific eCatalogue standardisation activities.

The scope of the study also includes a detailed analysis of standards relevant to eCatalogues. To this effect, several standards and schemes are considered and analysed. In parallel, the two most prominent standards related to eCatalogue processes and messages (UBL and c-Catalogue) are compared with a view to identify and document their level of similarity; this effort also provides input to the standardisation bodies which are currently working towards the convergence of these two standards.

### **Structure of the study**

The present study is split into three parts:

- **State of Play (SoP):** discusses different eCatalogue concepts and examines Member State current practice, i.e. presenting some eCatalogue projects (Hungary, Italy, Latvia, Norway, Sweden, the UK and Scotland). It analyses common features, needs, difficulties and implementation gaps.
- **Standardisation Activities (SIR):** reviews on-going standardisation activities for eCatalogues and product description/classifications; identifies, through a high level gap analysis of the two most prominent eCatalogue standards on processes and messages (UBL and c-Catalogue), trends, synergies and gaps and proposes actions to remedy these. It clarifies who are the main standardisation actors and requirements for participating in their activities.
- **Functional Requirements (FReq):** presents preliminary legal and functional requirements for eCatalogues to form initial offers in a public procurement procedure. It provides recommendations on how to implement eCatalogues and specifies “open issues” for further analysis. Both the requirements and the recommendations are drafted in a way suitable for providing input into the EU Member States and EEA countries, the European Commission and the appropriate standardisation bodies (OASIS, CEN/ISSS and UN/CEFACT).

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### **Summary of “State of Play” report**

In accordance with the new legislative framework, electronic catalogues constitute electronic documents that may form tenders (or parts of them), describing offered products and prices. In this context, eCatalogues may be considered as “supplier prospectuses”, similar to those already used in commercial transactions, either in paper or in an electronic format.

Current implementations in Member States tend to overlook this use of eCatalogues and rather focus on the implementation of ICT eProcurement systems capable of storing products and prices, to enable eOrdering and eInvoicing. In all investigated cases in the public sector in the EU, format and content of “supplier prospectuses” is specified by contracting authorities, introducing significant overheads for suppliers in the tender creation process. In addition, the mechanisms used for the submission of “eCatalogue prospectuses” using electronic means may not always satisfy all requirements of the EU Directives, if performed in the pre-awarding phases, particularly those related to security, confidentiality, and traceability.

The eCatalogue prospectuses currently available on the market can be grouped into those created according to buyer specifications (i.e. the buyer specifies the content and format of eCatalogues that suppliers must abide to) and those created according to supplier specifications. The latter type of prospectuses can be further divided into those created for retail use (i.e. addressed to consumers for business-to-consumer transactions) and for wholesale/professional use (i.e. addressed to enterprises for business-to-business transactions).

In order to reduce transactional costs and increase competition, it would be desirable for eCatalogue prospectuses to become interoperable. Hence, a suitable organisational and technical framework for the efficient exchange of eCatalogue prospectuses should be established. This can be achieved by the standardisation of specifications for creating eCatalogue prospectuses, which also define content, format and presentation specifications. The public sector in the EU should attempt to use existing eCatalogue standards for the creation and use of eCatalogues in public procurement, enabling suppliers to create “eCatalogue prospectuses” which can offer possibilities for re-utilisation. Such an approach should lead to a shared framework for eCatalogue prospectus creation, maintenance and transmission.

There are currently two promising standards which could form a suitable solution for the interoperable exchange of eCatalogue data. UBL 2.0 and c-Catalogue define processes and messages for the exchange of business documents based on eCatalogues, making use of XML. UBL is an official OASIS standard, while c-Catalogue is a standard initially defined by CEN/ISSS and is currently under development by UN/CEFACT. These standards are currently being converged; a process which is anticipated to offer one, unique standard for conducting business electronically, making use of eCatalogues. Prospectuses which are built in line with an industry-wide standard are interoperable, offer possibilities for re-utilisation for several purposes and can contribute to the anticipated efficiency gains of eCatalogues in public procurement.

Apart from the need for standardising processes and messages for conducting business electronically through the use of eCatalogues, the adoption of additional standards is necessary for standardising the manner in which products and services are described in an eCatalogue. Such schemes are referred to as product description and classification schemes; including CPV, UNSPSC, eCI@ss, GPC, NCS and eOTD. Currently, the existence of so many product description and classification schemes generates an interoperability problem, which can be overcome either by the establishment of one, unique scheme that can accommodate the needs of all industries and all purposes, or by the establishment of a mapping/reference framework which can allow the interoperable co-existence of different schemes.

However, based on an analysis conducted on typical public procurement competitions and indicative tenders, it is apparent that the pre-award phases in public procurement require the description of several more aspects in tenders than just offered products/services. For instance, a typical tender contains information on the supplier competencies, previous projects and experience, ISO certifications, etc. In this sense, in order for eCatalogue prospectuses to form full tenders it is necessary this type of information to also be standardised, which would be possible through the extension of UBL and c-Catalogue (or the anticipated unified standard).

The structure of the report is as follows:

- **Legal background on electronic catalogues:** Presents the legal provisions of the EU Directives 2004/17/EC and 2004/18/EC, as well as, of the EC explanatory document on conducting eProcurement, primarily focusing on eCatalogues
- **eCatalogue abstract types:** Presents the two ways eCatalogue can be interpreted (referred to as “abstract types”), as well as, the current practice of eCatalogues in Europe
- **Scope of eCatalogue prospectuses and expected benefits:** Presents the types of procurement in which eCatalogue prospectuses appear to be suited for, as well as, expected benefits from their optimum use
- **State of play I: eCatalogue practices by public purchasers in the EU:** Contains a comparative analysis on the eCatalogue initiatives studied in the various European countries, identifying common points, differences, needs, requirements and good practices
- **State of play II: eCatalogue practices in the private sector in the EU:** Considers the investigated private systems and concludes on their common features and benefits. As expected, private sector eCatalogue initiatives do not follow the rules of the EU Directives on public procurement (applicable in the public sector); hence these differences are also discussed
- **Analysis on content:** Identifies content requirements for the creation of tenders used for public procurement and the description of offered products/services contained in eCatalogues
- **Interoperability and standardisation of eCatalogue prospectuses:** Discusses the importance of establishing interoperable eCatalogue prospectuses, and presents in brief current relevant initiatives in standardising eCatalogues and product description/classification schemes, as well as, relevant standardisation bodies
- **Conclusions:** Summarises on the analysis carried out and proposes steps for improving the current environment for the use of eCatalogues in public procurement
- **Annex I: eCatalogue initiatives / projects in European public administrations:** Presents information on the investigated countries and systems, through the use of “country sheets”

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## **Summary of “Standardisation Activities” report**

The ongoing digitisation of the market and the increasing needs for the electronic support of business-to-business and business-to-government transactions have intensified the necessity of standardisation through the establishment of open and commonly acceptable standards. Standardisation activities in the area of electronic public procurement can ensure the interoperable exchange of information between organisations using the latest communication technologies. The use of standards can result in cost and time savings, as well as in the expansion to new markets. In addition, standardisation can play a significant role in building the confidence of European market players in eProcurement.

Electronic catalogues forming tenders, as foreseen in the EU Directives on public procurement, can be used under all eProcurement procedures and substantially benefit both suppliers and buyers, primarily due to the automated processing they can offer. The automated processing of eCatalogues however appears to be possible only when eCatalogues are formed and exchanged in a standardised manner i.e. when they are interoperable and can be re-used for several purposes. Hence, standardisation in this field is necessary for increasing efficiency through the reduction, or even elimination, of manual intervention.

Currently, there is a plethora of electronic catalogue formats, product description and classification schemes, aimed at providing guidelines for the exchange of electronic catalogues amongst consumers and vendors. This report aims at identifying and presenting the most relevant eBusiness initiatives/standards developed by international standardisation bodies (OASIS, CEN/ISSS and UN/CEFACT) in the area of eCatalogues. Two main eCatalogue standards have been developed in parallel, namely UBL 2.0 and c-Catalogue, developed by OASIS and CEN/ISSS respectively. Both standards primarily focus on post-awarding phases of procurement (eOrdering and eInvoicing), while their specifications can be also applied for pre-awarding, possibly following some extensions/customisations. These two prevailing initiatives/standards in the area of eCatalogue standardisation are compared in terms of their business documents, processes and messages, in order to identify similarities and gaps. This effort also provides input to the standardisation bodies which are currently working towards the convergence of these two standards.

In addition to eBusiness initiatives/standards, this report discusses the standardisation activities in the area of product description and classification schemes. Such schemes constitute a core component of eCatalogues, offering the ability to accurately categorise and describe products and services contained in eCatalogues using standardised product hierarchies and sets of attributes. In this respect, the interoperability of eCatalogues is closely associated with the interoperability of description/classification schemes used to describe products within eCatalogues. Best practices of such schemes are identified and presented in this report, while two potential scenarios for achieving interoperability are discussed.

Current experiences on eCatalogue implementations are also presented, taking into consideration the progress of EU Member States and EEA countries. Specifically, European countries presenting significant progress in eProcurement initiatives related to eCatalogues are investigated. Their activities demonstrate the willingness of Member States and EEA countries to improve the current situation in the way business-to-government transactions are carried out, based on industry-wide standards. These activities can contribute to acquiring the necessary intelligence on the current gaps between the specification of existing standards and the European public sector needs. This intelligence must form input to Standardisation Bodies for the enhancement and improvement of the existing standards.

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The structure of the report is as follows:

- **Overview of Standardisation Bodies:** Describes the structure for the standardisation bodies that undertake initiatives in the standardisation of the eProcurement processes (OASIS, UN/CEFACT, CEN/ISSS), as well as, their latest major activities in the field, primarily focusing on the field of eCatalogues.
- **eCatalogue standards and other relevant standardisation initiatives:** Provides an overview on the key standardisation initiatives related to eProcurement and eCataloguing, covering ebXML, UBL, UN/EDIFACT, and a number of CEN Workshops.
- **Standards for Product Classification and Description:** Presents the widely-used standards CPV, UNSPSC, eCI@ss, NATO Codification System, GPC and eOTD for product description and classification. Standards are analysed and compared in terms of their classification structure and product description through attributes. Potential resolutions on the interoperability issues caused by the existence of several such schemes are discussed.
- **eCatalogue Standardisation activities in selected EU Member States and EEA countries:** Several Member States presenting significant progress on eProcurement are investigated and their initiatives concerning the practical use of standards are analysed.
- **Analysis and assessment of the current standardisation environment:** Presents the role of standardisation in the field of public procurement, and explains the current situation of having several eCatalogue standards which generate interoperability issues. It provides a detailed comparison of the two prominent standards for conducting business electronically, namely UBL and c-Catalogue.
- **Conclusions:** Outlines the main findings of the analysis on the standardisation initiatives and classification schemes, providing recommendations for the further progress in standardisation.
- **Annex I: Standardisation Bodies Teams' Description:** Presents the Technical Committees related to the development of eProcurement standards, with the respective contact points.
- **Annex II: Invoice content details/attributes:** Details the content that is included in electronic invoices, according to the EU Directive on VAT Invoicing and the CEN/ISSS eInvoicing Workshop.
- **Annex III: Comparison between UBL 2.0 and c-Catalogue:** Compares the business processes, documents/messages, activity diagrams, and information entities of UBL and c-Catalogue.
- **Annex IV: Use of UBL 2.0 and c-Catalogue in pre-awarding phases:** Presents the messages of UBL 2.0 and c-Catalogue which could be used in the pre-awarding phases of public procurement.

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## **Summary of “Functional Requirements” report**

The report focuses on analysing rules and practices for the use of eCatalogue prospectuses in both the public and the private sectors, with a view to formulate requirements and recommendations for their further development. In this direction, two eCatalogue evolution phases are presented, aiming at identifying the steps towards the optimum use of eCatalogues in order to fully exploit all potential efficiency gains anticipated. The first phase towards a better use of eCatalogues (Evolution Phase I) relates to the point where suppliers, instead of creating and submitting buyer-defined eCatalogue prospectuses (i.e. abiding to eCatalogue specifications defined by contracting authorities), use their already established supplier-defined eCatalogue prospectuses. The second evolution phase (Evolution Phase II) refers to the optimum use of eCatalogue prospectuses by the wide adoption of standards regarding eCatalogue exchange as well as the description and classification of their content. The use of eCatalogue standards would allow eCatalogue prospectuses to be created, exchanged and managed in a standardised manner, presenting opportunities to seize efficiency gains by automated or semi-automated processing.

This report presents an overview of the legal background for the use of eCatalogue prospectuses in public procurement, summarising the legal aspects presented in “State of Play”. This is followed by an overview of the foreseen procedures for one-off and repetitive purchases, as set out in the EU Directives, and supplemented with the identified legal requirements for the use of eCatalogues for the submission of offers.

Based on the identified legal requirements, preliminary functional and non-functional requirements are identified for eProcurement systems which make use of eCatalogue prospectuses. The former describe the functionality and behaviour of such systems given specific input, while the latter describe general attributes of ICT systems which are not bound to a specific functionality. Particularly, the report identifies preliminary functional requirements for the procurement of one-off contracts (open and restricted procedures) and for the procurement of repetitive contracts (Framework Agreements and Dynamic Purchasing Systems). In addition, preliminary functional requirements for the use of eCatalogues in eAuction events are discussed. In terms of so-called “non-functional requirements”, eProcurement systems should particularly take into account requirements of interoperability and security.

More specifically, the structure of the report includes the following sections:

- **Use of eCatalogue prospectuses in public procurement:** Presents an overview of the eCatalogue abstract types, as discussed in the “State of Play” report, and identifies two evolution phases for the improvement of the current setting on the use of eCatalogues in public procurement
- **The legal framework for eCatalogues:** Presents a legal background on the foreseen eProcurement procedures and possible use of eCatalogue prospectuses, providing an overview of legal requirements and rules. These are formalised in eight legal requirements for the use of eCatalogues in public procurement.
- **Functional Requirements:** Analyses a set of functional requirements for ICT systems and tools, with specific focus on the use of eCatalogues in the different public procurement procedures and phases. Within this section, a number of functional requirements are identified, covering all phases of the eProcurement cycle and all procurement procedures (open, restricted, Framework Agreements, Dynamic Purchasing Systems and eAuctions).
- **Non-functional and technical requirements:** Describes a set of non-functional and technical requirements for ICT systems and tools, with specific focus on interoperability and security provisions for eProcurement systems making use of eCatalogues
- **Conclusions:** Enlists a number of good practices and recommendations for Member States, Standardisation Bodies and the European Commission, in order to improve the current environment of the use of eCatalogues in public procurement.

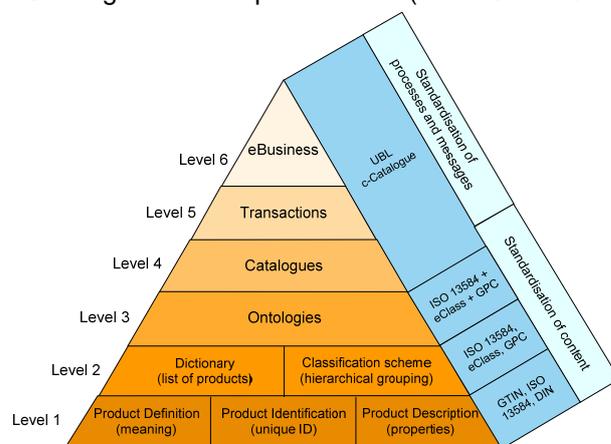
## **Main conclusions and recommendations**

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 eCatalogues in the context of public procurement, both for the pre and post-award phases.

The standardisation of the use of eCatalogues relates to two main areas: the standardisation of processes/messages and the standardisation of content. The former can be dealt with by two promising standards, namely UBL 2.0 and c-Catalogue. However, the existence of these two standards, along with numerous other industry-specific standards, which attempt to standardise the use of eCatalogue for eBusiness, has created a significant interoperability gap. 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. The content of eCatalogue prospectuses can be categorised into: 1) content related to product/service descriptions, and 2) content covering other information aspects included in a prospectus (i.e. not related to product/service descriptions). 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. The latter type of content (i.e. that which is not related to product/service descriptions) concerns the additional information suppliers must include in eCatalogues for tendering in pre-award phases of public procurement (e.g. supplier competencies, previous projects and experience, ISO certifications, etc.). This type of content can be accommodated by the further extension of UBL and c-Catalogue (or their anticipated uniform standard) to cover all information aspects required in the pre-award phases of public procurement.

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 eCatalogue standards such as UBL and c-Catalogue for standardising eCatalogue content not related to product/service descriptions.

In addition to the above, additional main findings of the three project reports are summarised below. They relate to the actions/initiatives to be undertaken by Member States and EEA countries, Standardisation Bodies and the European Commission in order to improve the current setting:

- **Standardise the use of eCatalogues:** Establish a suitable framework for the use of eCatalogue standards for the creation, management and exchange of eCatalogue prospectuses, also covering the standardisation of eCatalogue content/format in the pre-award phases of public procurement. In this context, the current initiatives for the convergence of UBL and c-Catalogue should be endorsed, and the converged standard should be promoted in both the private and public sectors. Further extensions to UBL and c-Catalogue (or their unified standard) should be completed, in order to also cover the need for standardising eCatalogue content, other than that related to product/service descriptions. (Actors: Standardisation Bodies, Member States, European Commission)
- **Standardise product/service descriptions within eCatalogue prospectuses:** Establish suitable standards as regards eCatalogue contents for describing products/services, including for a more interoperable use of product classification and description schemes. (Actors: Standardisation Bodies, Member States and Private Sector)
- **Enhance existing systems towards using eCatalogues in both pre and post-awarding purposes:** Review existing eProcurement systems with a view to establishing "eCatalogue stock management systems" which utilise standardised, interoperable "eCatalogue prospectuses" (i.e. based on industry-wide standards), in order to support all phases of the procurement cycle, both for pre and post-awarding purposes (Actors: Member States)
- **Perform the active collection of tenders respecting the rules of non-discrimination and equal treatment:** Establish appropriate procedures for the "active collection of tenders" (i.e. "punch-out") as an alternative submission technique. The active collection of tenders is a new technique allowed under the EU Directives, based on which contracting authorities can actively collect tenders from suppliers' websites. This technique offers opportunities for automation, however its current use does not always meet all the requirements set by the EU Directives on the receipt of tenders (Actors: Member States and European Commission)
- **Establish specifications for Dynamic Purchasing Systems (DPS):** Under the EU Directives, DPS systems are solely based on electronic means and expected to offer efficiency gains and transparency. However, in practice the exact operation of such systems still remains unclear for many procurement actors. Specifications for DPS should define in a more detailed way how a DPS should function in line with the EU Directives. (Actors: Member States and European Commission)
- **Establish a framework for the electronic submission of proof documents:** Establish a suitable legal, organisational and technical framework for the submission of proof documents in electronic format. This can offer efficiency gains through cost-reduction and acceleration to public procurement procedures. Current EC initiatives investigating this topic should be supported, in order to contribute towards the establishment of such an appropriate environment (Actors: European Commission, Standardisation Bodies and Member States)
- **Educate both the public and private sectors on the new eProcurement rules:** Apart from educating the public and private sectors on the provisions of the EU Directives, as well as, procedures and tools, particular attention should be given to training on standards and the efficient use of eCatalogues. Through such initiatives, suppliers should gain a better understanding of the potential benefits in conducting business with the public sector, in particular when performed through electronic means and eCatalogues. (Actors: Member States and European Commission).