



PEPPOL Deliverable D4.1 Standard Basic eOrdering Format and Data Structure



Version 1.2



PEPPOL WP4 2009-07-07



Borderless eProcurement
Let's make it happen!

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Pending EC approval

5 eOrdering Standardization Approaches¹⁷

5.1 Definition and background

The Oxford English Dictionary defines a Standard as “A definite level of excellence, attainment, wealth, or the like, or a definite degree of any quality, viewed as a prescribed object of endeavor or as the measure of what is adequate for some purpose.”

ISO/IEC Guide 2:2004 defines a standard as a “document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context.”

Standards¹⁸:

- Cover several disciplines: dealing with all technical, economic and social aspects of human activity and covering all basic disciplines such as language, mathematics, physics, etc.;
- Are coherent and consistent: standards are generally developed by technical committees which are coordinated by a specialized body, and ensure that barriers between different areas of activity and different trades are overcome;
- Result from participation: standards reflect the results of joint work involving all competent parties concerned and are validated by consensus to represent all relevant interests: producers, users, laboratories, public authorities, consumers, etc.;
- Are a living process: standards are based on actual experience and lead to material results in practice (products – both goods and services, test methods, etc.); they establish a compromise between the state of the art and the economic constraints of the time;
- Are up to date: standards are reviewed periodically or as dictated by circumstance to ensure their currency, and therefore evolve together with technological and social progress;
- Have a reference status: in commercial contracts and in court in the event of a dispute;
- Have national or international recognition: standards are documents which are recognized as valid – nationally, regionally or internationally, as appropriate;
- Are available to everyone: standards may be consulted and purchased without restriction.

Why standards matter

Standards make an enormous and positive contribution to most aspects of our lives. Standards ensure desirable characteristics of products and services such as quality, environmental friendliness, safety, reliability, efficiency and interchangeability - and at an economical cost.

When products and services meet our expectations, we tend to take this for granted and be unaware of the role of standards. However, when standards are absent, we soon notice. We soon care when products turn out to be of poor quality, do not fit, are incompatible with equipment that we already have, are unreliable or dangerous.

¹⁷ European Commission, 2009, Analysis of Business Requirements for e-Invoicing in a Public Procurement Context

¹⁸ World Standards Services Network Homepage (<http://www.wssn.net/WSSN/faqs.html>)

When products, systems, machinery and devices work well and safely, it is often because they meet standards.

What standards do

- make the development, manufacturing and supply of products and services more efficient, safer and cleaner
- facilitate trade between countries and make it fairer
- provide governments with a technical base for health, safety and environmental legislation, and conformity assessment
- share technological advances and good management practice
- disseminate innovation
- safeguard consumers, and users in general, of products and services
- make life simpler by providing solutions to common problems

5.2 Overview of relevant Standardization Initiatives

The following illustration provides an overview of some of the most relevant events and initiatives regarding standardization in the area of eProcurement. Although it has been agreed to use content standards developed by CEN/ISSS WS BII within the PEPPOL project, an overview of other cross-industry standardization activities will provide a better understanding of the history and current set-up of standardization approaches in the eProcurement area.

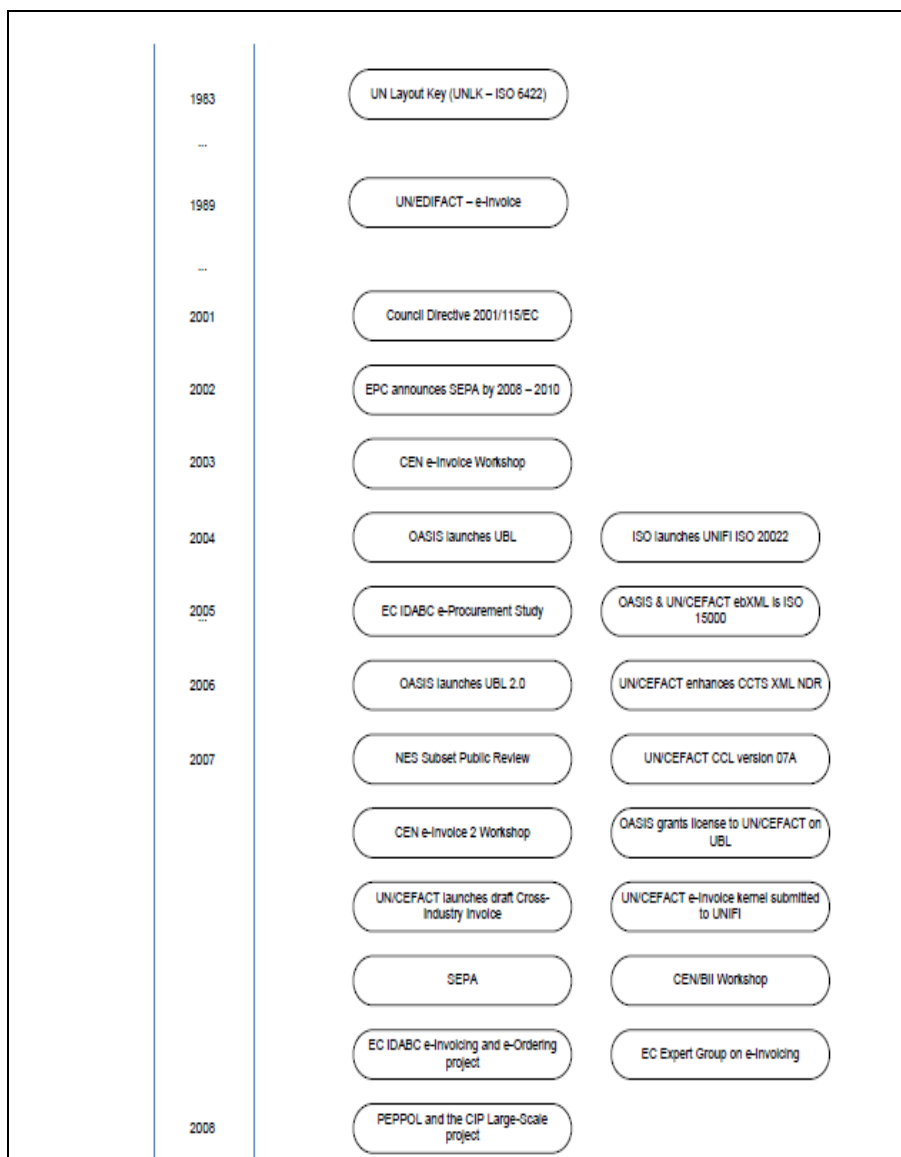


Figure 3: Overview Standardization Approaches in eProcurement¹⁹

5.3 ISO

ISO (International Organization for Standardization) is a network of the national standards institutes of 159 countries, one member per country, with a Central Secretariat in Geneva, Switzerland, that coordinates the system.

ISO is a non-governmental organization that forms a bridge between the public and private sectors. On the one hand, many of its member institutes are part of the governmental structure of their countries, or are mandated by their government. On the other hand, other members have their roots uniquely in the private sector, having been set up by national partnerships of industry associations. Therefore, ISO enables a consensus to be reached on solutions that meet both the requirements of business and the broader needs of society.

Because "International Organization for Standardization" would have different acronyms in different languages ("IOS" in English, "OIN" in French for *Organisation internationale de normalisation*), its founders decided to give it also a short, all-purpose name. They chose "ISO", derived from the Greek

¹⁹ European Commission, 2009, Analysis of Business Requirements for e-Invoicing in a Public Procurement Context

isos, meaning "equal". Whatever the country, whatever the language, the short form of the organization's name is always ISO.

ISO has developed over 17500 International Standards on a variety of subjects and some 1100 new ISO standards are published every year. The full range of technical fields can be seen from the listing International Standards. Users can browse that listing to find bibliographic information on each standard and, in many cases, a brief abstract. The online ISO Standards listing integrates both the ISO Catalogue of published standards and the ISO Technical programme of standards under development.

Home page: <http://www.iso.org/iso/home.htm>

Some work outputs:

- ISO 14001 - The world's environmental management system standard
- The ISO 9000 Family - Global management standards

5.4 UN/CEFACT

The **United Nations Centre for Trade Facilitation and Electronic Business, (UN/CEFACT)** has a mission to improve the ability of business, trade and administrative organizations, from developed, developing and transitional economies, to exchange products and relevant services effectively - and so contribute to the growth of global commerce. The Centre is a subsidiary body of the UNECE Committee on Trade (United Nations Economic Commission for Europe).

Home page: <http://www.unece.org>

Relevant work output:

- **EDIFACT**

United Nations/Electronic Data Interchange For Administration, Commerce, and Transport (UN/EDIFACT) is the international EDI standard developed under the United Nations. The work of maintenance and further development of this standard is done through the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) under the UN Economic Commission for Europe, in the Finance Domain working group UN CEFACT TBG5. EDIFACT has been adopted by the International Organization for Standardization (ISO) as the ISO standard ISO 9735.

The EDIFACT standard provides

- A set of syntax rules to structure data,
- An interactive exchange protocol (I-EDI),
- Standard messages which allow multi-country and multi-industry exchange.

5.5 OASIS – UBL

OASIS (Organization for the Advancement of Structured Information Standards) is a not-for-profit consortium that drives the development, convergence and adoption of open standards for the global information society. The consortium produces Web services standards along with standards for security, e-business, and standardization efforts in the public sector and for application-specific markets. Founded in 1993, OASIS has more than 5,000 participants representing over 600 organizations and individual members in 100 countries. OASIS is distinguished by its transparent governance and operating procedures.

Home page: <http://www.oasis-open.org/specs/#ublv2.0>

Work outputs:

- **UBL**

UBL, the Universal Business Language, is the product of an international effort to define a royalty-free library of standard electronic XML business documents such as purchase orders and invoices. Developed in an open and accountable OASIS Technical Committee with participation from a variety of industry data standards organizations, UBL is designed to plug directly into existing business, legal, auditing, and records management practices, eliminating the re-keying of data in existing fax- and paper-based supply chains and providing an entry point into electronic commerce for small and medium-sized businesses.

UBL is based on xCBL 3.0 and focuses on libraries and business documents.

- **WS (Web Service)**

The Web Services Description Language WSDL is an XML-based language that provides a model for describing Web services. The WSDL defines services as collections of network endpoints, or ports. The WSDL specification provides an XML format for documents for this purpose. The abstract definition of ports and messages are separated from their concrete use or instance, allowing the reuse of these definitions. A port is defined by associating a network address with a reusable binding, and a collection of ports define a service. Messages are abstract descriptions of the data being exchanged, and port types are abstract collections of supported operations. The concrete protocol and data format specifications for a particular port type constitutes a reusable binding, where the operations and messages are then bound to a concrete network protocol and message format. In this way, WSDL describes the public interface to the web service.

WSDL is often used in combination with SOAP and XML Schema to provide web services over the Internet. A client program connecting to a web service can read the WSDL to determine what functions are available on the server. Any special datatypes used are embedded in the WSDL file in the form of XML Schema. The client can then use SOAP to actually call one of the functions listed in the WSDL. XLang is an extension of the WSDL such that "an XLANG service description is a WSDL service description with an extension element that describes the behavior of the service as a part of a business process". Resources or services are exposed using WSDL by both Web Services Interoperability (WS-I Basic Profile) and WSRF framework.

5.6 NES-UBL

NES (Northern European Subset)

As part of the Northern European cooperation on e-commerce and e-procurement, representatives from Denmark, Sweden, Norway, Finland, UK and Iceland have set up a working group for developing a NES subset of UBL 2.0 documents. The work was initiated by Denmark.

The purpose of the NES subset is to facilitate harmonization of different types of e-procurement documents in countries that are already using UBL or that are considering using UBL 2.0 documents. This provides an opportunity to base e-procurement documents and processes on a coordinated NES subset.

The focus of NES is to define the specific use of UBL 2.0 electronic procurement documents domestically and between the member countries. The definition covers semantic interoperability within and between all business sectors, public and private. NES members are also closely involved in the international UBL 2.0 process.

Work outputs:

Profiles describing business processes and scenarios based on a common application of UBL applicable for both domestic and cross border trade. Each profile documents a context specific use of the UBL constrained by business rules and recommendation for the use of the relevant UBL documents. The Profile Definitions are a key normative documentation of NES.

Profiled Message Definitions based on a common subset of the UBL XML documents (the NES Document libraries) and common components (the NES Common Library) reflecting the needs expressed in the profiles. The Profiled Message Definitions are a key normative documentation of NES. A document describing the NES Information Model Architecture is also available.

General guidelines and code lists for the use of UBL within NES. These documents should be considered as a normative part of NES. Validation tools in the form of restricted XML Schema and Schematron files in order to support implementation and run-time validation.

Home page: <http://www.nesubl.eu>

5.7 CEN/BII

CEN

The European Committee for Standardization (CEN) is a business facilitator in Europe, removing trade barriers for European industry and consumers. Its mission is to foster the European economy in global trading, the welfare of European citizens and the environment. Through its services it provides a platform for the development of European Standards and other technical specifications.

CEN's 30 National Members work together to develop voluntary European Standards (ENs).

These standards have a unique status, since they also are national standards in each of its 30 Member countries. With one common standard in all these countries, and every conflicting national standard withdrawn, a product can reach a far wider market with much lower development and testing costs. ENs help build a European Internal Market for goods and services and to position Europe in the global economy. More than 60.000 technical experts as well as business federations, consumer and other societal interest organizations are involved in the CEN network that reaches over 480 million people.

So far, CEN has published **13.420** publications (end February 2009).

All European Standards (EN) and drafts (prEN), as well as any other approved document (Technical Specifications (CEN TS), Technical Reports (CEN TR) and CEN Workshop Agreements (CWA), can be obtained from any of our National Members.

Home page: <http://www.cen.eu/cenorm/homepage.htm>

CEN/ISSS WS BII (Business Interoperability Interfaces for public procurement in Europe – BII)

Objective

The objectives of the Workshop are to provide a basic framework for technical interoperability in pan-European electronic transactions. These are to be 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 Workshop will be focused on implementation approaches and coordinating pilots implementing the technical specifications that are output.

The requirements and final specifications will be input into UN/CEFACT.

The starting points for the Workshop are the NES and CODICE customizations of OASIS Universal Business Language 2.0.

The CEN/ISSS Workshop on business interoperability interfaces for public procurement in Europe (CEN/ISSS WS/BII) is established in order to

- identify and document the required business interoperability interfaces related to pan-European electronic transactions in public procurement expressed as a set of technical specifications, developed by taking due account of current and emerging UN/CEFACT standards in order to ensure global interoperability;
- co-ordinate and provide support to pilot projects implementing the technical specifications in order to remove technical barriers preventing interoperability.

To facilitate implementation of electronic commerce in a standardized way, thereby enabling the development of standardized software solutions as well as efficient connections between trading partners without case by case specification of the data interchange, the workshop agreed to document the required business interoperability interfaces as profile descriptions. The end goal is to reduce the cost of implementing electronic commerce to a level that is economical for small and medium size companies and institutions.

Home page: <http://www.ds.dk/en-GB/Sectors/ICT/Bii/Sider/default.aspx>

Work outputs:

A profile description is a technical specification describing:

- a business process, 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.

As well as determining what documents are used, the profile restricts document content in terms of elements and the cardinality of elements. The key standardization aspect of the profile description is thus in the semantics rather than the syntax. Consequently the messages within a profile can be based on different message standards/syntax as long as the chosen standard contains all the necessary data elements.

Although the Profile Descriptions provided by CEN ISSS WS/BII will be neutral of syntax, the workshop has agreed to develop its deliverables based on the UBL messages standard. This is done in order to be able to provide the market with implementable specifications. The implication of this decision is that the description of especially message content is aligned to the UBL 2.0 message standard.

CEN ISSS WS/BII has issued a number of profiles, out of which the ones relevant for eOrdering will be discussed in more detail in chapter 7.3.

Profiles:

BII01 Catalogue only	BII12 Tendering Simple
BII02 Catalogue with update	BII13 Advanced Procurement with Dispatch
BII03 Basic Order only	BII14 Prior Information Notice
BII04 Basic Invoice Only	BII15 Scanned invoice
BII05 Basic Billing	BII16 Catalogue Deletion
BII06 Basic procurement	BII17 Multi Party Catalogue
BII07 Simple procurement	BII18 Punch Out
BII08 Basic billing with dispute response	BII19 Advanced Procurement
BII09 Customs bill	BII20 Customer Initiated Sourcing
BII10 Tender Notification	BII21 Statement
BII11 Qualification	BII22 Tender Invitation

Figure 4: List of CEN ISSS WS/BII Profiles

Details on the respective profiles can be found on: <http://spec.cenbii.eu/>.

5.8 xCBL

xCBL (XmlCommonBusinessLibrary)

The XML Common Business Library (xCBL) is a set of XML building blocks and a document framework that allows the creation of robust, reusable, XML documents to facilitate global trading. It essentially serves one language that all participants in e-commerce can understand. This interoperability allows businesses everywhere to easily exchange documents for e-commerce, giving global access to buyers, suppliers, and providers of business services.

xCBL 4.0, the latest version, provides a smooth migration path from EDI-based commerce because of its origins in EDI semantics. xCBL will be able to support all essential documents and transactions for global e-commerce including multi-company supply chain automation, direct and indirect procurement, planning, auctions, and invoicing and payment in an international multi-currency environment. xCBL 4.0 is the first version that uses XSDL as the canonical form. Previous versions all used SOX.

xCBL is the result of extensive collaboration between Commerce One® and the leading XML standards bodies, e-commerce enterprises, and hardware and software vendors, as well as analysis of existing e-commerce standards including Electronic Data Interchange (EDI) and RosettaNet, Industry leaders Compaq, Microsoft, SAPMarkets, and Sun Microsystems are leveraging xCBL 3.0 and xCBL 3.5 as a key standard in the development and delivery of business-to-business solutions.

- Based on UN/Edifact
- Focus on business documents

Home page: <http://www.xcbl.org>

5.9 OAGIS²⁰

The Open Applications Group Integration Specification (OAGIS) is an effort to provide a canonical business language for information integration. It uses XML as the common alphabet for defining business messages, and for identifying business processes (scenarios) that allow businesses and business applications to communicate. Not only is OAGIS the most complete set of XML business messages currently available, but it also accommodates the additional requirements of specific industries by partnering with various vertical industry groups.

The Open Applications Group (OAGi) -- the organization that oversees the OAGIS -- was formed in November 1994 in an effort to dramatically ease everywhere-to-everywhere integration (inside and outside of the enterprise, as well as across the supply chain). OAGi has done this by crafting standards where necessary and by recommending standards where they already exist.

The first release of OAGIS was developed in 1995 to address the need for a common business language that would enable business applications to communicate. OAGIS provides the definition of business messages in the form of Business Object Documents (BODs) and example business scenarios that provide example usages of the BODs. The business scenarios identify the business applications and components being integrated and the BODs that are used. Release OAGIS 8.0, includes 200 business messages and 61 business scenarios that can be used to integrate business applications.

²⁰ <http://www.ibm.com/developerworks/xml/library/x-oagis/>

While it is important to provide a horizontal backbone to integrate across vertical industries, OAGi realizes that each vertical industry group has the domain knowledge for its specific industry and often uses an existing vocabulary that is widely known within that industry. For this reason, to provide a true canonical business language OAGi must work with vertical industry groups to leverage the understanding that already exists and provide an overlay of the vertical information on top of the horizontal understanding of that information. This is similar to the layers of information provided in a blueprint of any physical structure.

Because of this, OAGi actively partners with many different vertical groups. Examples of this include various automotive standards bodies from around the world (such as AIAG, Odette, NADA STAR, and Aftermarket), as well as standards bodies focused on human resources, chemical, aerospace, and a range of other industries.

OAGi is also involved with other standards bodies, including UN/CEFACT and WS-I. OAGi has also been recognized as a work group by the Memorandum of Understanding Management Group (MoU MG) of the four recognized standards bodies in the world, which include International Electrotechnical Commission (IEC), International Organization for Standardization (ISO), International Telecommunication Union (ITU), and United Nations Economic Commission for Europe (UN/ECE).

Home page: <http://www.oagi.org>

Pending EC approval