



BSI Standards Publication

Electronic Public Procurement — Architecture

Part 1: Reference Architecture Overview

National foreword

This Published Document is the UK implementation of CEN/TS 17011-1:2025.

The UK participation in its preparation was entrusted to Technical Committee IST/47/-/1, e-Procurement.

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: Aperçu de l'architecture de référence

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Referenzarchitektur

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European foreword

This document (CEN/TS 17011-1:2025) has been prepared by Technical Committee CEN/TC 440 “Electronic Public Procurement”, the secretariat of which is held by DIN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document is part of a series of multi-part documents prepared, or under preparation, by CEN/TC 440:

- 17011-series: **eProcurement Architecture**, providing a set of specifications outlining different aspects of the eProcurement architecture for Business Interoperability Specifications.
- 17014-series: **eTendering Business Interoperability Specifications**, providing a set of specifications outlining business choreography, transaction, syntax binding specifications and guidelines required to support the eTendering processes.
- 17015-series: **eCatalogue Business Interoperability Specifications**, providing a set of specifications outlining business choreography, transaction, syntax binding specifications and guidelines required to support the eCatalogue processes.
- 17016-series: **eOrdering Business Interoperability Specifications**, providing a set of specifications outlining business choreography, transaction, syntax binding specifications and guidelines required to support the eOrdering processes.
- 17017-series: **eFulfilment Business Interoperability Specifications**, providing a set of specifications outlining business choreography, transaction, syntax binding specifications and guidelines required to support the eDelivery processes.

The terms “shall”, “shall not”, “should”, “should not”, “may”, “need not” “can” and “cannot” are interpreted according to Annex H of the CEN-CENELEC Internal Regulations, Part 3¹.

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¹ <https://boss.cen.eu/reference-material/refdocs/pages/>

Introduction

The objective of the work in CEN/TC 440, Electronic public procurement, is to provide standards, in the form of Business Interoperability Interface specifications, as a tool to ensure interoperability and thus facilitate efficient and effective electronic information exchange in the (public) eProcurement processes between the buyer and the seller.

This is to facilitate end-to-end eProcurement² including both pre-award and post-award processes (see Figure 1).

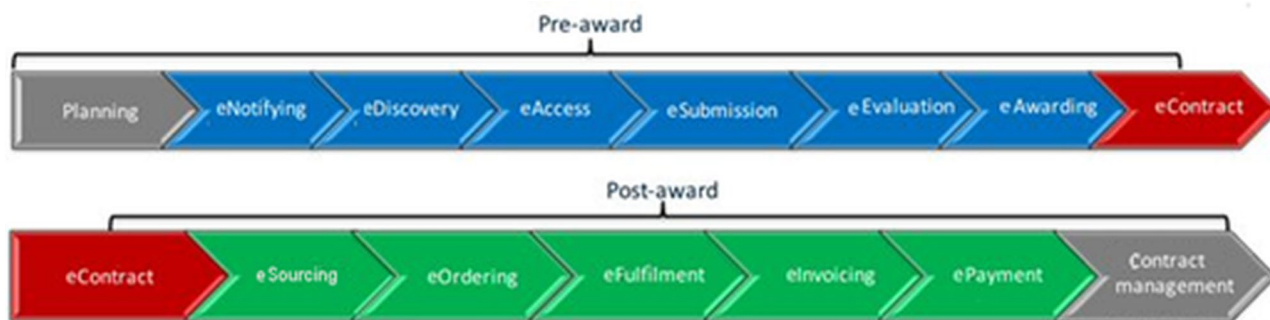


Figure 1 — The pre-and post-award processes of public eProcurement

eProcurement refers to the use of electronic communications and transaction processing by public sector organizations and economic operators when buying/providing supplies and services or tendering works, see Tables 1 and 2.

Table 1 — Business areas in the pre-award phase of public eProcurement

	Business Areas		Example information exchange ^a
	Planning	Planning of milestones and electronic tracking of the achievements. Planning is an internal business process and is not covered by BII specifications.	
Pre-award (eTendering)	eNotifying	Notification includes information exchange, publication and dissemination of notices related to procurement opportunities such as Prior Information Notices, Contract Notices and Contract Award Notices. eNotifying is specified by the Publication Office of the European Commission and therefore out of scope for TC 440.	<ul style="list-style-type: none"> — Prior Information Notice — Contract Notice — Contract Award Notice
	eDiscovery	Search for interesting business opportunities on a publication portal. eDiscovery is a service of the Publication Office of the European Commission and therefore out of scope for TC 440.	<ul style="list-style-type: none"> — Search notice query transaction — Notice metadata transaction

² The concept of end-to-end procurement is further elaborated in COM(2013) 453 final on end-to-end eProcurement to modernize public administration [6].

	Business Areas		Example information exchange ^a
	eAccess	Procurement procedure subscription and access includes electronic access to tender documents and specifications, including electronic access to supporting documents for sellers in the preparation of a Tender response, e.g. clarifications, questions and answers. This includes expressing interest in a business opportunity to be listed in the procurement procedure.	<ul style="list-style-type: none"> — Express Interest in Call for Tenders — Call for tender — European Single Procurement Document (ESPD) (Out of scope for TC 440) — Invitation to Tender — Pre-award Catalogue Request — Call for Tender Question and answers
	eQualification	identification and verification of the capabilities of any economic operator that wants to present an offer in a particular tendering procedure.	<ul style="list-style-type: none"> — Qualification
	eSubmission	Secure submission of tenders and/or catalogues in electronic format to the contracting body (contracting authority/ contracting entity), which can receive and process it in compliance with applicable legal requirements.	<ul style="list-style-type: none"> — Tender — Tender Withdrawal — Virtual Company Dossier — European Single Procurement Document (ESPD) — Pre-award Catalogue
	eEvaluation	Evaluation of the electronic tenders and/or catalogues received by the contracting body following the closing deadline of a tender competition, including electronic exchange to enable the clarification of tender content by evaluations. eEvaluation is an internal business process and therefore out of scope for TC 440.	<ul style="list-style-type: none"> — Clarification questions and answers
	eAwarding	Information exchange regarding award of the contract, including electronic exchange to support tenderers requesting additional information about the result of the procedure.	<ul style="list-style-type: none"> — Awarding notification — Additional information
	eSourcing	Information exchange regarding the catalogue to be used for ordering.	<ul style="list-style-type: none"> — Pre-award catalogue request — Pre-award catalogue
	eContract	Signing, enactment of a contract / agreement and possibly its related catalogue through electronic means between the contracting bodies and the winning tenderer(s), as well as the signing of contract amendments and possibly their related catalogue.	<ul style="list-style-type: none"> — Draft Contract — Signed Contract — Catalogue Request — Catalogue
It should be noted that the business transactions listed are examples only and do not constitute the full list of relevant business transactions.			

Table 2 — Business areas in the post-award phase of public eProcurement

	Business Areas		Example information exchange
Post-award	eSourcing	Activities preparatory to issuing an order, including the exchange of electronic messages with winning tenderers who have signed a framework agreement with the contracting body, a request for quotation and the response to the quotation (e.g. framework agreements with reopening competition), etc. Exchange of catalogue information and punch-out ordering from a catalogue	<ul style="list-style-type: none"> — Request for Quotation — Quotation — Catalogue request — Catalogue — Catalogue response — Punch-out — Shopping cart
	eOrdering	Issuing of an electronic order by the contracting body and its acceptance by the seller or conversely issuing of an electronic order agreement by the seller.	<ul style="list-style-type: none"> — Order — Order Response — Order cancellation — Order agreement
	eFulfilment	Electronic exchange of information that enable monitoring the execution of the order or the contract.	<ul style="list-style-type: none"> — Despatch Advice — Receiving Advice
	eInvoicing	Issuing, sending, receiving and processing invoices and billing data. eInvoicing is covered by TC434 and therefore out of scope for TC 440.	<ul style="list-style-type: none"> — Invoice — Credit Note
	ePayment	Financial payment involving currency transfer between a contracting body and a seller. ePayment is covered by ISO/TC68 and therefore out of scope for TC 440.	
	Contract management	Management of relationships with sellers and contracts, including archiving. Contract management is an internal business process and therefore out of scope for TC 440.	

The aim of CEN/TC 440 is to provide a focused and coordinated approach to development of appropriate European Standards that:

- build upon and complement existing initiatives, such as CEN WS/BII3 (see Annex B) and CEN/TC 434, and be part of a wider eBusiness standardization portfolio;
- facilitate end-to-end eProcurement and thus support European policy objectives expressed in e.g. “Digital Agenda for Europe” [3] and “A strategy for eProcurement (COM(2012) 179 final)” [4], “End-to-end eProcurement to modernise public administration (COM(2013) 453 final)” [5], the “public procurement directive” [6];
- recognize the rather ambitious timeline envisaged for implementation of the new procurement directives, stressing the importance of available standards as a basis for compliant software solutions to be available in the market;
- allow for user engagement and participation as well as effective production of the standards required by being focused on public procurement needs (but take generic applicability for ‘Business-to-Business’ into account as and when relevant);

- facilitate improved efficiency and cost reduction in both public and private sector entities;
- focus on cross-border and cross-platform interoperability to allow economic operators to select the platform of their choice and still can participate in procurement opportunities across the full European market.

The deliverables from CEN/TC 440 collectively provide a framework for interoperability in pan-European electronic transactions for eProcurement expressed as a set of technical specifications that is expected to:

- allow for efficient and effective implementation of electronic exchange of documents in public eProcurement as well as in transactions between enterprises;
- support implementation of end-to-end eProcurement including both pre-award and post-award processes for public procurement;
- facilitate interoperability between independent solutions;
- provide an added value to stakeholders, such as solution and service providers, as well as contracting bodies and economic operators involved in the eProcurement process.

The work in CEN/TC 440 focuses on interoperability aspects of the exchange of information between business partners. Back-office information processing, e.g. the internal processing and business evaluation of the actual information content, is out of scope. To ensure interoperability, the information exchange will be described in the form of:

- choreography specifications, describing the flow of the business process and the sequence of information exchange;
- business transaction information models, describing the information content of each information exchange;
- syntax binding specifications, describing how the information content of a business transaction information model is represented in a specific syntax;
- guidelines, providing additional guidance on specific topics.

For a full description of different document types, see Clause 6 of this document.

It should be noted that CEN/TC 440 deliverables do not provide the full legal framework enabling business partners to fulfil their legal obligations. It is the responsibility of the business partners themselves to ensure that the business documents exchanged respect any rules specified by relevant legislation, including requirements related to personal data protection, as well as rules stated as part of a trading relationship between them.

Use of ePO ontology

This document uses the ePO ontology, owned by the European Union, available here (<https://github.com/OP-TED/ePO>) and licensed under a CC BY 4.0 licence.

1 Scope

The purpose of this deliverable is to specify and describe the reference architecture applied as the basis for the development of Business Interoperability Interface specifications in the eProcurement domain by the CEN/TC 440 Technical Committee.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8601-1:2019, *Date and time — Representations for information interchange — Part 1: Basic rules*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp/>

3.1

agent

person, organization, or system that act in procurement or have the power to act in procurement

[SOURCE: eProcurement Ontology]

3.2

business process

sequence or network of activities and collaborations between two or more agents

3.3

business process variant

specification of a business process belonging to a choreography

Note 1 to entry: Different variants may support different electronic information exchange or collaborations. Agents may publicly advertise their capability to support one or more variants in an automated fashion.

3.4

choreography

set of business processes having the same goals

3.5

collaboration

interaction between two or more agents that result in the exchange of data between the agents involved as part of a business process

3.6

role

part played by an agent in a particular business process, including its responsibilities (options and obligations) to perform certain activities and collaborations in that business process

Note 1 to entry: The role is used to show the division of labour and responsibility amongst the agents involved in the process or within the organization of an agent.

3.7

state

set of options and obligations of the participating agents at a defined step in a business process to perform specific activities and collaborations

Note 1 to entry: Additional information: an activity of an agent or a collaboration may cause the transition of one state to another in a predefined set of next steps.

3.8

transaction

content of data exchanged or shared between the agents in a collaboration

Note 1 to entry: A transaction is the atomic unit that leads to a synchronized state in the information systems of collaborating agents. It is the basic building block to define the choreography between agents. When an agent recognizes an event that changes the state of a business object within a business process, it uses a transaction to synchronize with the collaborating agent. A transaction therefore changes the state of a business process. It carries the intention of the initiating agent and is represented by a data structure that is defined by a data model. The exchange of a transaction may alter legal obligations between business partners.

4 Symbols and abbreviated terms

ABB	Architectural Building Block
IoP	Interoperability
EIF	European Interoperability Framework
EIRA	European Interoperability Reference Architecture

5 eProcurement set of interoperability specifications

5.1 General

Despite its initial focus on the public sector, the vision of CEN/TC 440 is that all organizations – independent of whether they are public or private and whatever their size and nationality – are enabled to conduct electronic business in an effective and efficient manner, significantly lowering costs for transaction processing.

The CEN/TC 440 mission is to spread and facilitate the use of eProcurement standards by sellers and buyers, and especially public administrations, by:

- identifying requirements (including legal) regarding eProcurement standards;
- providing a general framework for the organizational and semantic levels of the electronic procurement documents;
- supporting the implementation of commonly applied international eProcurement standards;
- providing organizational support to ensure the governance and maintenance for those requirements.

This will be achieved by focusing on business requirements expressed in the European market and provide guidance to implementation projects on how relevant international standards may be applied in order to meet those requirements.

A Business Interoperability Interface (BII) is specified in order to fulfil one or more Business Goals. To achieve the stated Business Goals the BII is based on one or more Business Requirement(s). A BII implements support for one or more Business Process(es) by defining the exchange of one or more Business Transaction(s).

When implemented a BII commits two or more Business Partners, each acting in one or more Role(s), by specifying how they implement electronic messaging or information sharing support through the exchange of one or more Business Transaction(s). The information content of each Business Transaction is specified in one or more Information Requirement Model(s). The technical messaging choreography for a Business Transaction is specified in one or more Business Collaboration(s).

5.2 Positioning in EIRA

EIRA provides a reference model that enables architects to position the IOP specifications. This document provides a domain-specific IOP specification to which any SBB implementing the ABB should be compliant to.

IoP specifications provide a valuable source of information to formulate requirements during architecture development and solution development. By identifying architectural building blocks through a common terminology, it

- helps reuse of cross domain building blocks such for instance eSignature Verification and Validation Service, and eTimestamp Creation Service;
- helps synchronization with European solutions such as CEF eDelivery;
- and will provide guidance in using them to provide the prescribed capability enabling, thus managing and rationalizing IT portfolios.

The CEN/TC 440 architecture has been specified by means of extensions of EIRA building blocks to ensure alignment to the EIF as shown in Figure 2.

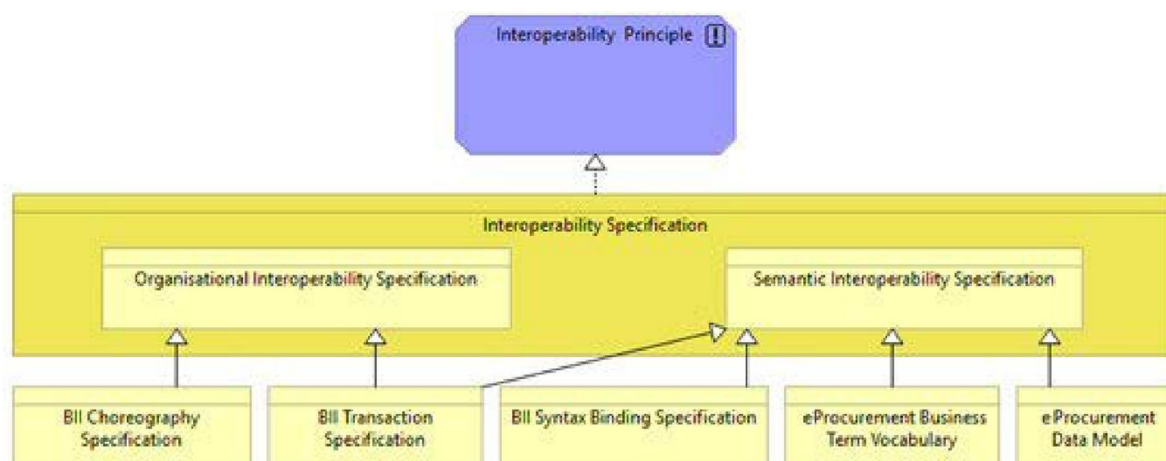


Figure 2 — EIRA extension

The eProcurement deliverables address mainly the organizational and semantic interoperability levels of the EIF framework.

The **BII Choreography specification** is an organizational interoperability specification that describes the relevant organizational Solution Building Blocks in order to fulfil specific sub-process goals. TC 440 does not intend to provide normative statements on the processes to be used to fulfil a given procurement procedure but focuses on the services required to achieve the desired goal, the capabilities supporting the service and the information exchanged between the main roles of the procurement process: the Buyer or Contracting body and the Seller or Economic operator.

Guidelines describe how choreographies may be used in order to support a procurement procedure for instance.

Additionally, in the **BII Transaction specification**, TC 440 establishes the core information elements that are required in the information exchange relating to a choreography, the corresponding data entities and the business rules that are applicable to these information elements. This specification addresses both the organizational and the semantic layer.

The **BII Syntax Binding specification** provides a mapping between the data entities specified in the BII transaction specifications and their corresponding UBL Document Schema or UN/CEFACT schema, for each information element in scope of TC 440. Note that this is consistent with the COMMISSION IMPLEMENTING DECISION of 31 October 2014 on the identification of Universal Business Language version 2.1 for referencing in public procurement.

The **eProcurement Business Term Vocabulary** represents the set of core Information elements that are relevant to the scope of TC 440 and compose the eProcurement data model of which each structured eProcurement document are composed.

The **eProcurement Documents** can be alternatively structured as a set of eProcurement properties specified in eProcurement entities composing the eProcurement data model or unstructured documents conveying eProcurement information.

These specifications are positioned in the EIF at the organizational and semantic level as shown in Figure 3.

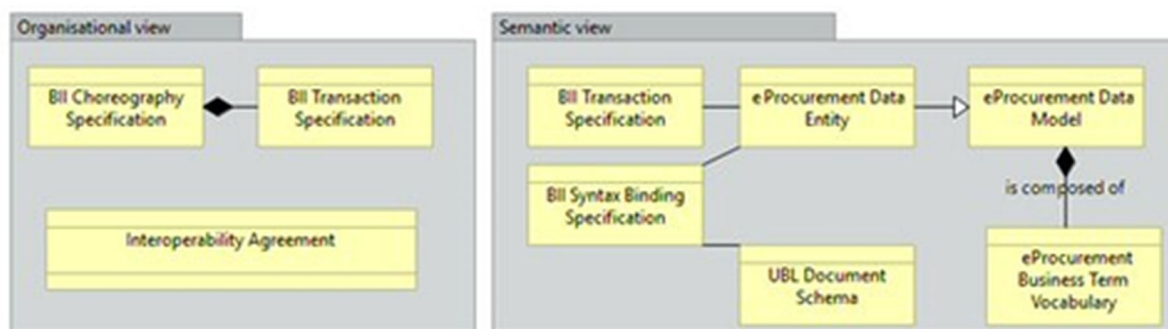


Figure 3 — EIF positioning

6 BII Choreography specification

6.1 General

A BII Choreography specification is used to describe the relatively complex Business Process(es) between two or more Business Partners, based on Business Goals and Business Requirements. See Figure 4.

6.2 Positioning in EIRA

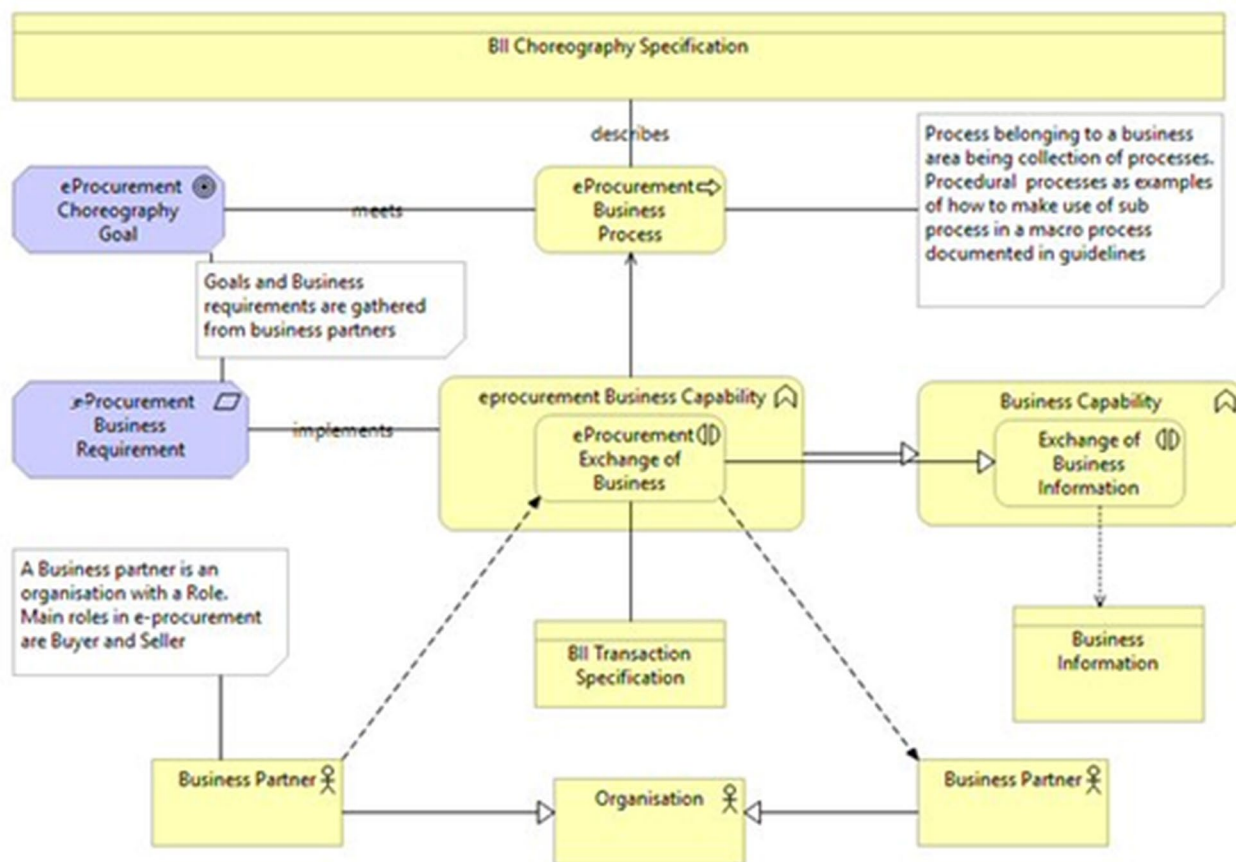


Figure 4 — BII Choreography specification

The [BII Choreography Specification] describes how an [eProcurement Business Process] involving [Business Partners] is supported by means of [Business Capabilities]. The [BII Choreography Specification] highlights the related specific [eProcurement Choreography Goals] of the [eProcurement Business (sub) Process].

In a business environment [Exchange of Business Information] is always implemented because the [Business Partners] have specified a set of [Business Goals] they want to achieve. Identifying and describing these [Business Goals] is a key prerequisite for any successful implementation.

Recognizing this fact TC 440 has made the expression of the goals and the [Business Requirements] that shall be fulfilled in order to achieve the stated goal, the main focus of its [BII Choreography Specification].

The goals, or objectives, of the [BII Choreography Specification] focus on describing the business value that may be achieved by implementing that specific choreography.

The specification additionally describes the [Business Capabilities] implementing the [Business Requirements]. The [Business Capabilities] use [eProcurement Exchange of Information] supporting the (sub)process to achieve the business goals.

[eProcurement Exchange of Information] refers to the BII Transaction specifications that in their turn describe the Business information that is exchanged.

Variants in the use of BII Transaction specifications to fulfil the business goals are listed in each choreography.

Transactions cannot be used outside a choreography and a variant of a choreography when variants are specified.

Variants cater for addressing different levels of maturity of information systems. The use of variants is further described below.

6.3 Specification template

This template is a guideline for the lay-out of the specification. Sections that are not applicable should be deleted. Additional sections may be added if useful.

BII Choreography specifications have the following contents:

- 1 Scope
- Scope of the choreography specification.
- 2 Normative references
- References to normative documents on which this specification is based.
- 3 Terms and definitions
- Definitions of terms used in this specification.
- 4 Business environment and high level business requirements
- 4.1 Choreographies (business) Goals
- Description of the context in which the business takes place (see Table 3 Business goals and Table 4 Business benefits).

Table 3 — Business goals

ID	Description
G-17016-1:2024-1	Enable trading partners to communicate without a previous bi-lateral setup or agreement.

Table 4 — Business benefits

ID	Description
G-17016-1:2024-5	Realize significant savings both by buyers and sellers through automating and streamlining in-house processes of ordering and subsequent activities as well through increasing quality of data exchanged.

- 4.2 Business environment
- 4.2.1 General
- 4.2.2 Business context
- A context diagram of the business (see Figure 5).

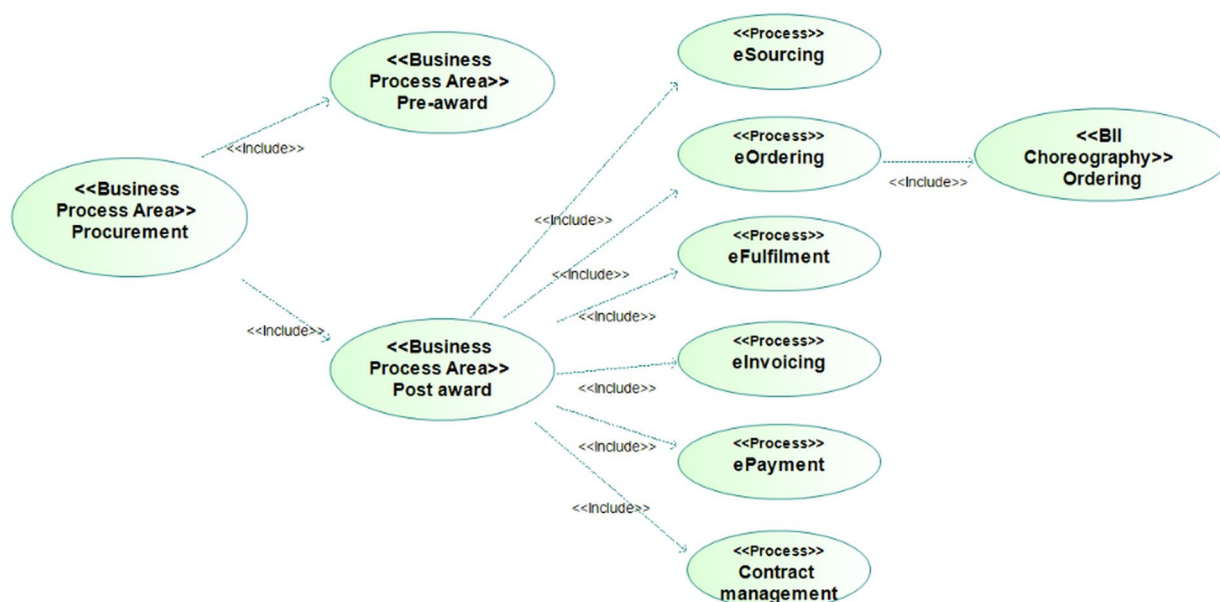


Figure 5 — Example of the position of the BII Choreography in the Procurement process

4.2.3 Positioning in EIRA (see Table 5)

Table 5 — Positioning in EIRA

EIRA ID	Title	Domain	Interface	Scope	Modality
EN 17016-1:2024	Electronic Public Procurement - Ordering - Choreography	Procurement	Machine /Buyer Machine /Seller	<ul style="list-style-type: none"> eProcurement extension of ABB176 Organizational Interoperability Specification eProcurement extension of ABB12 Business Capability eProcurement extension of ABB170 Exchange of Business Information eProcurement extension of ABB16 Business Rule 	Endorsing