

Cross Industry ORDER-X PROCESS SPECIFICATION

**A common standard for electronic orders
in Germany and France
based on
UN/CEFACT Cross Industry Order (CIO)**

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1 Introduction E-Ordering

1.1 Module and driver of the digitalized supply chain

More and more companies are digitalizing business processes in order to gain more time for value adding and strategic processes and to counteract cost pressure. The ordering process is an essential component of the supply chain. The customer's purchasing department creates and sends purchase orders to the supplier. The supplier's sales department receives and processes these orders as sales orders.

For a comprehensive digitalization of business processes on the customer and supplier side, the existence of an electronic standard data format (e-order) with high acceptance and usability is a building block for a successful digitalization of the entire process chain. The "Order-X" standard complements the electronic invoice format Factur-X/ZUGFeRD in this respect: it uses identical data structures, exploits the advantages of a hybrid format (PDF and XML with order data) and is therefore also suitable for use in small and medium-sized enterprises (SMEs) and public institutions.

1.2 Factur-X/ZUGFeRD as a blueprint

With the hybrid format Factur-X/ZUGFeRD and Factur-X, solutions have been developed especially for SMEs that are at the beginning of electronic invoice exchange and are not yet able to fully process structured data. Decisive for cross-border acceptance is the use of internationally recognized and renowned standards and the possibility of a lean and cross-industry business data exchange. With Order-X, this proven and tested philosophy is also used in the area of orders. Like for Factur-X/ZUGFeRD, Order-X consists of the following two components:

1. PDF file:

The visual representation of the order is easily readable for humans (an ISO standard PDF/A-3 file is used).

2. XML file:

The order data in structured form (XML) is automatically processed by systems (XML according to Cross-Industry Order (CIO), Order Response (CIOR) and Order Change (CIOC) of UN/CEFACT SCRDM - Supply Chain Reference Data Model). Like for Factur-X/ZUGFeRD, several profiles of XML set of data have been defined in order to fit to SME's capabilities to provide structured data, starting with BASIC, then COMFORT (which is comparable to EN 16931 profile of Factur-X/ZUGFeRD), and EXTENDED. These 3 profiles are in fact 3 subsets of unique CIO / CIOR / CIOC message for these 3 types of messages (named Order type message, Order Response type message and Order Change type message).

In addition, other supporting documents can be attached, embedded in the XML file or in the PDF. Like for Factur-x/ZUGFeRD, and in order to be easily processed by end users, especially SMEs, Order-X natural form the PDF/A-3 visual presentation with XML attached.

In the course of development, the FeRD and the FNFE-MPE are closely coordinating with other national and international organizations (including the Coordination Office for Secure IT Standards (KoSIT), CEN, UN/CEFACT, PDF Association) in order to achieve the greatest possible acceptance and synergies with already ongoing initiatives and projects on the topic.

1.3 Objective

The objective of this document is to standardize the Business processes and the Business transactions of the Ordering process used by different industries (cross-industries). The business process is the 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. Each Business transaction is realized by an exchange of Business documents. The sequences in which these documents are used, composes a particular instance of a scenario and are presented as activity diagrams in the document.

1.4 Audience

The audience of this document is all users who are interested in the Ordering process.

2 Ordering Process

The ordering process is used to agree on delivery, prices, quantities and payment of goods or services between the supplier and the customer. This document describes the process how to reach agreement.

The Place Purchase Order collaboration, initiated by the Customer, either results in an agreement on delivery, prices, quantities and payment, or in no agreement at all without any residual obligations of either party. During the Place Purchase Order collaboration several cycles may occur in which the conditions are negotiated. However, it is highly preferred to use catalogues and/or quotation information in order to find an agreement prior to the order phase.

Agreement is only reached when both parties have confirmed the conditions that were agreed, either by an Acknowledgement message or Purchase Order Response type message.

During the Place Purchase Order collaboration either party may reject the conditions proposed. The order is then not created and neither party has residual obligations. For reasons of compatibility with existing practices the Supplier may in his rejection include suggestions on conditions that would be acceptable for him.

After agreement has been reached and the Place Purchase Order collaboration has successfully ended, either party may initiate a collaboration to change or even cancel the order. The conditions for order change or cancellation (like e.g. any penalties) are agreed in the Order Change collaborations. If no agreement is reached during the Order Change collaborations, which may include several cycles of negotiation, the conditions of the original order apply.

To simplify understanding, the business partners involved are limited to Customer and Supplier. In the total trade business, each of the business partner can have more than one role. For the ordering process, the Customer can act as the Buyer, the Buyer Requisitioner, the Ultimate Customer, the Consignee, the Invoicee, the Payer, the Ship To party and the Ultimate Ship To Party. The Supplier covers the roles of the Seller, the sales company, the Consignor, the Ship From party, the Invoice Issuer and Payee.

More precisely, on the Customer side:

- BASIC Profile:
 - The **Buyer Party** is the party which acquires the goods or services, and will book the cost in its accounts on the basis of the invoice (which is addressed to the Buyer). It represents legally the Customer.
 - The **Ship To Party** is the party to which the goods or services will be delivered.
- COMFORT Profile:
 - The **Buyer Requisitioner Party** is the party which has initially requested for an Purchase Order if different from the Buyer Party. It may be the party which has raised the purchase request and is generally the end user of the good or service purchased.
 - The **Invoicee Party** is the party to which the invoice will be sent for processing on behalf of the Buyer Party and on its request, if different from the Buyer Party.
- EXTENDED Profile:
 - The **Buyer Agent Party** is the party which raises the Order or Order Change and receives the Order Response, on behalf of the Buyer, if different from the Buyer Party. It could be a dedicated Purchase Service, internal or external to the Customer.
 - The **Product End User Party** is the end user of the good or service, if different from the Buyer Requisitioner Party or from the Buyer Party.
 - The **Ultimate Ship To party** is the party to which the goods or services will be delivered, if different from the Ship To Party. For example, in case the goods or services must be delivered directly to a customer of the Customer.

On the Supplier side:

- **BASIC Profile:**
 - The **Supplier Party** is the party which sells the goods or services and in which accounts the transaction will be booked on the seller side accounts on the basis of the invoice (which is addressed to the Buyer). It represents legally the Supplier.
 - The **Ship From Party** is the Party which will deliver the goods or services or from which the good or service will be picked up in case of Pick up.
- **EXTENDED Profile:**
 - The **Invoicer Party** is the Party which will create and send the invoice on behalf of the Supplier Party, if different from the Supplier Party.

2.1 Business Process Elaboration

The Place Purchase Order collaboration and the Order Change collaborations (always Customer initiated) are part of the Ordering process. Below figure shows the activities carried out by the Customer and Supplier in conducting the Order Process and the states that the Order Entity achieves as the various information exchanges occur.

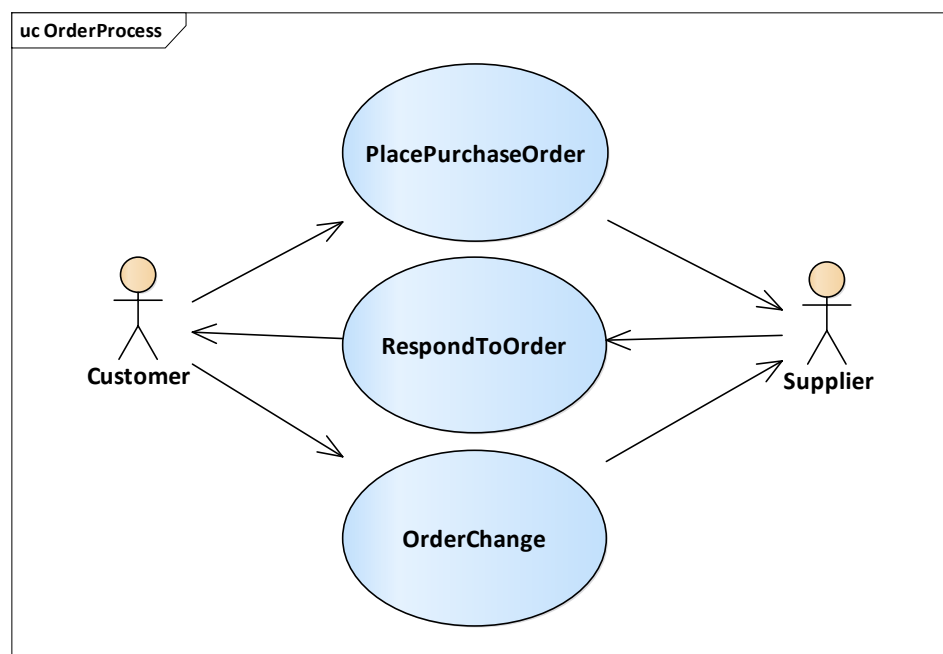


Figure 2-1 Order Process Use Cases

The information envelopes (business messages) for transactions used are:

- PlacePurchaseOrder (Order type message, corresponding to 220 on UNTDID 1001)
- ChangeOrder (Order Change type message corresponding to 230 on UNTDID 1001)
- RespondToOrder (Order Response corresponding to 231 on UNTDID 1001)

The Acknowledgement message is not included in below diagram for clarity reasons.

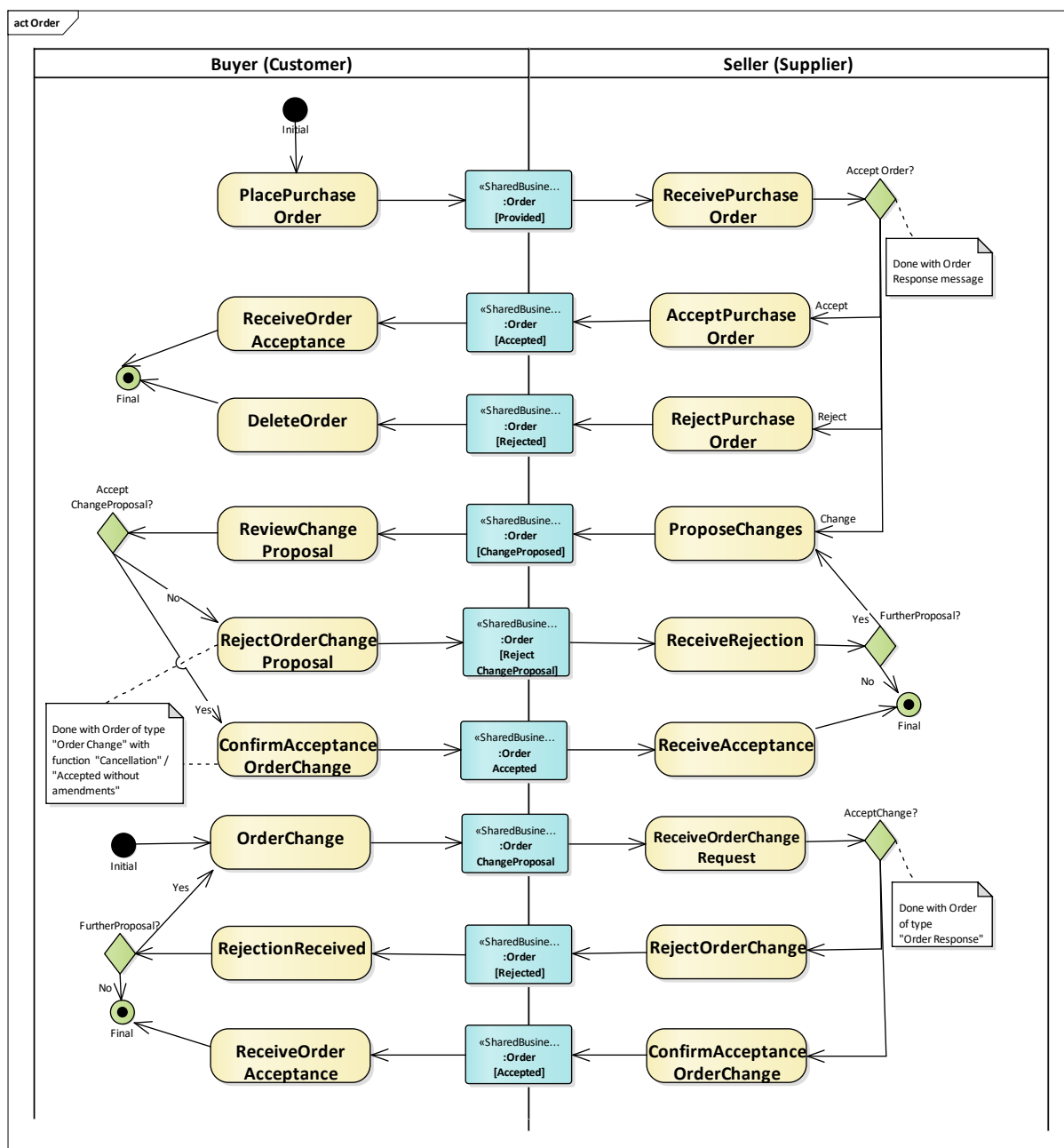


Figure 2-2 Order Process Activity Diagram

2.2 Purchase Ordering (Business Collaboration)

E-Ordering may be used between parties who have previously concluded contracts in which conditions for ordering, delivery and payment have been defined, or between parties who define those conditions in the Order itself. Conditions related to the Purchase Order, which are not explicitly defined in the Order, will default to prior contractual arrangements or in default of those, to the applicable trade laws impacting transactions between the two parties.

2.2.1 Principles

The principles are:

- The Customer initiates the collaboration by sending an Order type message to the Supplier using the Place Purchase Order collaboration.

- The Supplier may Accept or Reject the Order or propose changes to the conditions of the order using the RespondToOrder/Change transaction (Order Response type message).
- The Customer may Accept or Reject the proposal or make a counter proposal using the ChangeOrder transaction (Order Change type message)
- The Supplier has the obligation to respond on the proposed changes using the RespondToOrder/Change transaction (Order Response type message) to Accept or Reject or once again counter propose (this negotiation may be repeated until an agreed or rejected order exist).
- Either party may respond by accepting the proposal received; the collaboration then results in an agreed Order and the Place Purchase Order collaboration ends.
- If the collaboration results in an agreed Order, the Supplier has the obligation to deliver the goods and/or services under the conditions defined, and the Customer has the obligation to pay for those goods and services under the agreed conditions.
- Either party may alternatively respond on proposals received by rejecting the proposals or by withdrawing earlier sent proposals; the Order then is withdrawn or cancelled and no residual obligations between the parties exist, except those that were already in effect before the Place Purchase Order collaboration was started and the collaboration ends.
- After the Place Purchase Order collaboration has been ended successfully and has resulted in an agreed Order, the Customer party may initiate an Order Change or Withdraw collaboration.

2.3 Purchase Order Response message

The Purchase Order Response type message is used by the Supplier to indicate the acceptance of all, or part, or none of the Customer's Purchase Order or Order Change types messages, and to propose, where appropriate, any changes for the underlying Order, including product substitution.

2.3.1 Principles

A supplier may respond for one or more goods items or services by:

- an acknowledgement of the Purchase Order or Order Change,
- an acceptance of the Purchase Order or Order Change,
- a proposal of amendment to the Purchase Order or Order Change,
- a rejection for all or part of the Purchase Order or Order Change.

The following principles serve to remove ambiguity in the application of a Purchase Order Response.

- Any change requested by the Supplier to a Purchase Order may be acknowledged by the buyer by sending a new Purchase Order (with a new Identifier, and in that case the original Purchase Order should be cancelled) or an Order Change. A Purchase Order Response or a new Purchase Order or an Order Change will refer to the original Purchase Order.
- A new Purchase Order or an Order Change will modify the original Purchase Order data when relevant, taking into account the Supplier's reply in the Purchase Order Response.
- A document and/or line status will indicate the acceptance, rejection or proposed amendments of all, or part, or none.
- A proposal of amendment may not be requested on:
 - the Purchase Order number (Identifier),
 - the Purchase Order Response or Order Change number,
 - the identification of buyer and seller,
 - the line item number of the Purchase Order or Order Change.

Required data in the Purchase Order Response are:

- Mandatory data in the Purchase Order
 - by the message itself
 - by a business rule
 - Except the lines: an Order Response may have no lines in case of full acceptance or Rejection.
- A code to identify the original Purchase Order being Responded
- Proposed amendments (changes) if any
- A change may not be requested on:
 - the Purchase Order number (Identifier),
 - the Purchase Order Response or Order Change number,
 - the identification of buyer and seller,
 - the line item number of the Purchase Order or Order Change.

In case the Purchase Order is not fully rejected or fully accepted, the line status indicates the status of each line using the UNTDID 1229 codelist, and more precisely:

- In case a line is accepted with amendments (code 6), which means the same product, but different price, quantity or date of delivery, the Order Response proposes the agreed quantity and can modify other information.
- In case a substituted Product is proposed, the line with the initial product must be rejected (code 7 = not accepted) with Agreed quantity equals to 0, and a new line must be added (code 1) with a substituted Product.

2.4 Order Change message

The Order Change type message is used by the Customer to indicate the acceptance, rejection (cancellation) of the amendments (changes) the Suppliers had made, through an Order Response type message, in the Purchase Order or previously received Order Change. The Order Change can be initiated by the Customer after placing the Purchase Order, even prior to receiving a Purchase Order Response from the Supplier.

Potentially, many Order Change messages can be sent, following Order Response messages or Order Change messages.

2.4.1 Principles

The following principles serve to remove ambiguity in the application of an Order Change.

- The content of an Order Change is assumed to affect:
 - the modification of a previous Purchase Order or Order Change as requested by the buyer
 - the modification of a previous Purchase Order or Order Change in confirmation or response to the amendments proposed by the seller in a Purchase Order Response.
- A change may not be requested on:
 - the Purchase Order number,
 - the identification of buyer and seller,

These changes may only be made by cancelling the previous Purchase Order and re-ordering through the Order Change.

- All data within the order line must be re-transmitted either changed or not (It is not an error to re-transmit unchanged data).

- The line item number(s) of the Order Change are the new lines item number(s) for this Purchase Order.
- The Buyer Purchase Order Identifier remains the same and is referenced in the Order Change.

Required data in the Order Change are:

- Mandatory data in the Purchase Order
 - by the message itself
 - by a business rule
- A code to identify the order being changed
- The changes requested

2.5 Use case Place Purchase Order

The Place Purchase Order Business Collaboration is achieved using the following transactions: PlaceOrder (Order type message), ChangeOrder (Order Change type message) and RespondToOrder/ Change (Order Response type message).

The sending and responding roles associated with these transactions are linked to the business partner types (Customer, Supplier) in the Use case diagram. The Order may be accepted/rejected or proposed for a change directly by the Supplier through an Order Response. The Customer may then propose an order change which replaces the previous ones, through an Order Change type message, to which the Supplier may answer, until an agreement is found by the acceptance by the Supplier (through an Order Response or a “by default” agreed business rule) of an Order Change type message raised by the Customer.

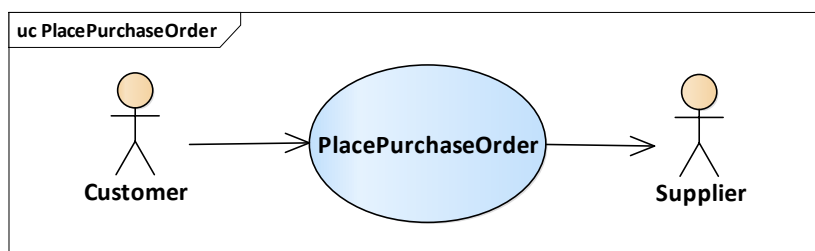


Figure 2-3 Place Purchase Order Use Case

Table 2-1 Business Collaboration Use Case Place Purchase Order

| Business Collaboration Use Case Description | |
|---|--|
| Business Collaboration | Place Purchase Order |
| Identifier | PlacePurchaseOrder |
| Actors | Buyer (Customer), Seller (Supplier) |
| Pre-conditions | A legal framework exists in which parties can trade. |
| Description | The Buyer orders goods and/or services to the Seller under conditions as stated in the Order. The collaboration involves the Buyer placing an Order to the Seller. The Seller responds by accepting the Order (and subsequent delivery and payment), rejecting the Order or proposing amendments. The Buyer responds by accepting or rejecting the proposal or proposing a change to the Order that in turn may be accepted or rejected by the Seller. |
| Post- conditions | Parties may or may not have an established trading relationship or may or may not have concluded one or more contracts in which conditions of a trading |

| Business Collaboration Use Case Description | |
|---|--|
| | relationship have been defined. |
| Exceptions | Parties may or may not have an established trading relationship or may or may not have concluded one or more contracts in which conditions of a trading relationship have been defined. |
| Remarks | Acceptance of the Order, explicit or implied, commits the Supplier (Seller) to deliver the products ordered under the agreed conditions, to the agreed location(s), at the agreed time(s) and at the agreed price(s). Thereafter, the Customer (Buyer) is committed to pay the Supplier (Seller) the agreed amount under the agreed payment terms. |

2.6 Use case Customer Initiated Order Change

The Customer initiated Order Change collaboration may be executed using the ChangeOrder type message (transaction) and RespondToOrder/Change transaction (Order Response Message). The business messages exchanged within these transactions are Order Change and Purchase Order Response. The sending and responding roles associated with these transactions are linked to the business partner types Customer and Supplier.

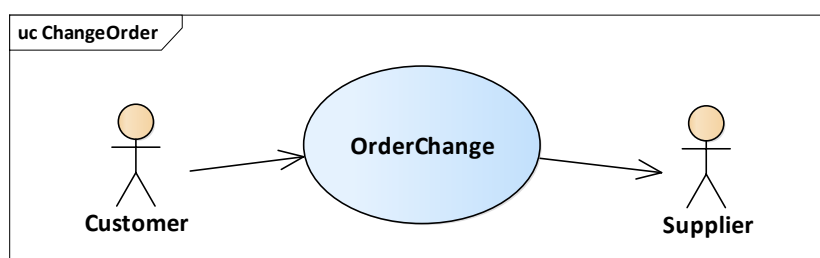


Figure 2-4 Order Change Use Case

Table 2-2 Business Collaboration Use Case Order Change

| Business Collaboration Use Case Description | |
|---|--|
| Business Collaboration | Customer Initiated Order Change |
| Identifier | CustomerInitiatedOrderChange |
| Actors | Buyer (Customer), Seller (Supplier) |
| Pre-conditions | An original Order (or Order Change) exists and has been approved. |
| Description | <p>The Buyer raises an Order Change. The Seller can accept, reject or propose amendments through an Order Response. Many exchanges may be necessary to reach an agreement or not.</p> <p>This process ends when the Seller has accepted or rejected a “final” Order Change sent by the Buyer. In case of non-agreement, the initial Order still applies.</p> |
| Post- conditions | <p>Acceptance of the changed Order</p> <p>Rejection of the proposed amendments within the Order Response</p> <p>Withdrawal of the Order.</p> |
| Exceptions | An Order, different from or the same as the earlier agreed order is agreed between Buyer and Seller. The change may mean that Seller is not to deliver any goods or services (in case of a cancelled order); the Buyer may or may not still have the obligation to pay costs. |

| Business Collaboration Use Case Description | |
|---|---|
| Remarks | Acceptance of the Order Change, explicit or implied, commits the Supplier (Seller) to deliver the products ordered under the agreed conditions, to the agreed location(s), at the agreed time(s) and at the agreed price(s). Thereafter, the Customer (Buyer) is committed to pay the Supplier (seller) the agreed amount under the agreed payment terms. |

3 Order-X Business Rules and Profiles

The concept of Order-X is also to propose profiles of data, in order to fit with companies' ability to provide order process information as structured data, with progressive complexity of the global supply chain process.

Order-X profiles have been built in coherence with Factur-X/ZUGFeRD profiles, where

- BASIC is the highly recommended profile for "standard" and "simple" supply chain process allowing high level of invoice process automation,
- EN16931 is equivalent to COMFORT contains all invoice information from the EN 16931,
- and EXTENDED is the global extended profile containing more business data, allowing for instance multi-delivery or multi-purchase order, or other Parties like Invoicee, Invoicer, ...

These 3 profiles for the 3 Order type messages (Order, Order Response and Order Change), are very close and mainly coherent with Factur-X profiles on invoice (for the business information present in Order and Invoice supply chain messages). The 3 profiles of the 3 Order type messages are built from a common subset of the 3 SCRDM COI, CIOR and CIOC messages, with a few business rules depending on the type of Order messages, exactly like the SCRDM CII message implements an Invoice, a Credit Note, a Self billing invoice, a prepaid invoice, ...

3.1 Order-X Business Rules

The business rules specific to Order types messages are the following:

- BR: Exchange Document Context – Specification Identifier (BT-24) Must be equal to (depending on profile used):
 - Profile BASIC : urn:order-x.eu:1p0:basic
 - Profile COMFORT : urn:order-x.eu:1p0:comfort
 - Profile EXTENDED : urn:order-x.eu:1p0:extended
- BR: The Document Type Code (BT-3) MUST be equal to:
 - 220 for an ORDER
 - 230 for an ORDER CHANGE
 - 231 for an ORDER RESPONSE
- BR: An Order or an Order Change (Document Type Code BT-3 = 220 or 230) MUST contain at least 1 Line
- BR: An Order Response (Document Type Code BT-3 = 231) MUST contain a Line Status Code on each line, if it has lines.
- BR: An Order (Document Type Code BT-3 = 220) MUST NOT contain a Line Status Code
- BR: An Order or Order Change (Document Type Code BT-3 = 220 or 230) MUST not contain a Substituted Product
- BR: In an Order type message (BT-3 = 220), the Referenced Buyer Order Line Reference MUST be absent or equal to the Line ID (BT-126)
- BR: In an Order type message (BT-3 = 220), the Referenced Buyer Order Line Reference MUST be absent or equal to the Line ID (BT-126)
- BR: An Order or Order Change (Document Type Code BT-3 = 220 or 230) MUST not contain an Agreed Quantity
- BR : an ORDER or an ORDER CHANGE MUST contain a delivery event or a pick up event
- BR : a delivery or a pick-up event MUST contain a date or a period
- BR: In order to automatically identify a supplier, the Seller identifier (BT-29), the Seller legal registration identifier (BT-30) and/or the Seller VAT identifier (BT-31) shall be present.

- BR: In order to automatically identify the Buyer, the Buyer identifier (BT-46), the Buyer legal registration identifier (BT-47) and/or the Buyer VAT identifier (BT-48) shall be present.
- BR: ON profiles BASIC OR COMFORT, the Order MUST NOT HAVE more than 1 Tender or Lot Reference on Header Level
- BR: ON profiles BASIC OR COMFORT, the Order MUST NOT HAVE more than 1 Object Identifier on Header Level
- BR: An Order (Document Type Code BT-3 = 220) MUST NOT contain a Previous Order Change Referenced Document
- BR: An Order (Document Type Code BT-3 = 220) MUST NOT contain a Previous Order Response Referenced Document

3.2 Order-X Profiles

3.2.1 Order-X BASIC Profile

The Order-X BASIC profile has been built to address a “standard” purchase order process, with no VAT information, except optionally on Totals, allowing single delivery or pick up mode in a single location with:

- on Line level: Product description, Substituted Product for Order Response type message only, Line Note, Net Unit Price, Reference to Blanket Order line ID, potential partial delivery, requested quantity, and line total,
- on Document level: Seller, Buyer, Ship From, Ship To Parties, with IDs, Name, Postal and electronic Addresses, Legal and VAT ID optionally (only for Seller and Buyer), Delivery terms, references to their business documents (Quotation, Contract, Blanket Order, Previous Order, Previous Order Change or previous Order Response), Requested delivery or pick-up date or period, Payment Terms, Totals and Buyer accounting reference.

3.2.2 Order-X COMFORT Profile

The COMFORT Profile is the BASIC profile with more information available optionally, allowing multiple delivery, Buyer Requisitioner Party, Invoicee Party, VAT information except VAT breakdown, Allowances and Charges on line and document levels and more details:

- on Line level: item Characteristics, additional referenced product documents, line reference ID of Quotation and Catalog Reference Documents, Additional Referenced Documents, Gross Price and price discount, Allowances and Charges, Delivery or Pick-up Date or period for each item (allowing multiple delivery on the same location), VAT codes on line.
- on Document level: with Buyer Requisitioner Party, Invoicee Party, Sales Order Reference (issued by the Seller), Tender or Lot Reference, Catalog Reference Document, Additional Referenced Documents, Ordered Object Identifier, Project Reference, Delivery Terms Location, Ship To and Ship From legal and VAT IDs, Payment means, Charges and Allowances on Document level with VAT codes.

3.2.3 Order-X EXTENDED Profile

The EXTENDED Profile is the COMFORT profile, with more information on line level, allowing for instance multiple delivery location, Buyer Requisitioner on line level, minimum and maximum requested quantities, Seller and Buyer legal Address (if different of Address), VAT Breakdown, ... and all information on EXTENDED profile for Factur-X/ZUGFeRD that can be present at the Order step of the global supply chain.

4 Generating Order-X instance

4.1 Generating Order-X PDF instance

4.1.1 Embedding the XML file

The order data in the XML format is embedded using a file specification dictionary. In order to do this, a valid MIME type must be specified for the document to be embedded. The MIME type for Order-X is always text/xml.

The embedded file's stream dictionary should contain a `Params` key. `Params` refers to a dictionary containing at least a `ModDate` indicating the last modification date of the embedded file.

The embedded document must also be included in the `Names` object tree so as to enable compliant PDF tools to represent the file together with additional information.

As a basic principle, several files can be embedded in the PDF/A-3 document, thereby enabling information documents relating to the order check to be packaged together with the order data document in the PDF/A-3. To identify, at PDF level, which of the embedded files is the order data document, the name of the order data document must be included in the corresponding metadata attribute.

The XML file is always embedded with the name order-x.xml.

There is also the option to embed other documents supporting the order as additional files, including complementary representations of the order data in other formats (for instance EDIFACT). The name of a complementary representation of the order must be:

- For an EDIFACT representation: order-xedifact.edi.
- For a UBL representation: order-xubl.xml.

The Data relationship must be:

- For order-x.xml : Data, Source or Alternative
- For other documents attached, including complementary representations: Supplement or Unspecified

4.1.2 PDF/A Extension scheme for Order-x

The properties of the extension schema are shown below.

Table 4-1 Extension schema properties

| Property | Value | Description |
|------------------------------|--|--|
| Name of the extension schema | Order-X PDF/A extension Schema | |
| URI | urn:factur-x:pdfa:CrossIndustryDocument:1p0# | The "#" character at the end of the URI should be noted! |
| Schema prefix | fx | Namespace prefix |

The table below shows the fields of the extension schema:

Table 4-2 Extension schema fields

| Field | Description | Example |
|---------------------|---|-------------|
| fx:DocumentType | For Order-X orders, the document type contains: ORDER or ORDER_RESPONSE or ORDER_CHANGE | ORDER |
| fx:DocumentFileName | The file name of the embedded invoice data document; must be identical to the value of the F tag in the file specification dictionary. In the Order-X standard, this value is order-x.xml | order-x.xml |
| fx:Version | The version of the XML schema for the invoice data | 1.0 |
| fx:ConformanceLevel | The XML order data profile in accordance with Order-X requirements (permitted values BASIC, COMFORT, EXTENDED) | COMFORT |