

# DPS Modelling Technique

## BPMN visualizing the e-CODEX DPS Business Collaborations and Business Transactions

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# 1. Introduction

The adopted standard for visualising the business collaboration and business transaction workflow is the *Business Process Model and Notation*<sup>1</sup> (**BPMN**) by the Object Management Group<sup>2</sup>. BPMN provides a notation that is readily understandable by all business users; business analysts, technical developers and business people managing and monitoring the described process. BPMN creates a standardized bridge for the gap between the business process design and process implementation.

## 2. Business Process Model Notation

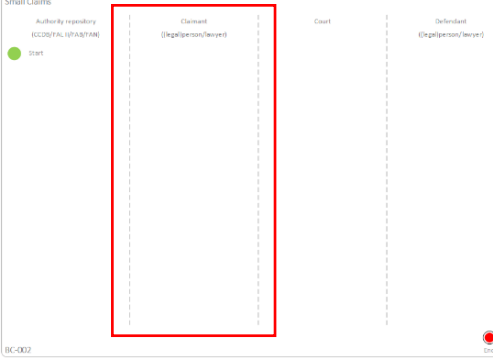


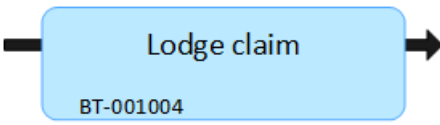
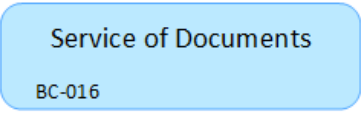
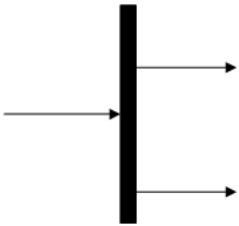
For e-CODEX business process design, and supporting the ebBP standard of the ebXML stack, a selection of BPMN elements are used in the Business Collaboration Design. The full set of BPMN elements are described in section 7.2 of the BPMN standard documentation.

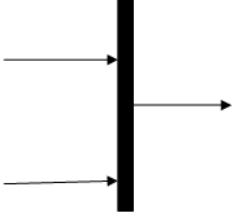



The BPMN standard integrates well with the specifications of the ebBP standard adopted in e-CODEX that provides choreography of individual business activities in the context of collaboration activities, resulting in exchanged business messages. In other words: the ebBP choreography is graphically presented by the BPMN standard.

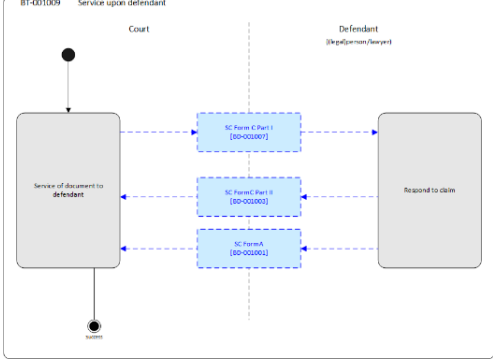

Symbols used in a Business Collaboration workflow	
Symbol	Description
 A BPMN Pool diagram titled 'Small Claims'. It shows a pool with four lanes: 'Authority responsible (CCDR/ITAL/STAB/IRAN)', 'Claimant (Legal persons/lever)', 'Court', and 'Defendant (Legal persons/lever)'. A green circle labeled 'Start' is in the first lane, and a red circle labeled 'End' is in the fourth lane. The ID 'UC-002' is at the bottom left.	<p><b>Pool:</b> is the graphical representation of participants ('roles') in a Collaboration. It acts as a graphical container for partitioning a set of activities.</p> <p>→ in e-CODEX the Pool includes all the roles that are involved in cross-border communication in the context of a specific legal instrument. This means that roles exclusively involved in domestic communication are not including in the pool.</p>

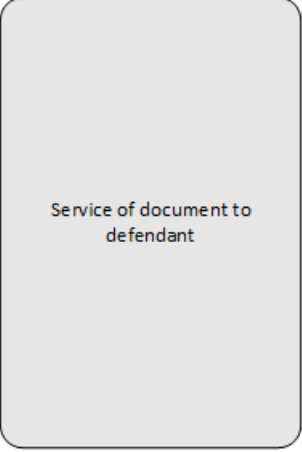


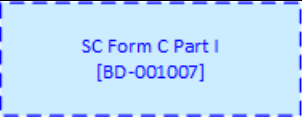

<sup>1</sup> BPMN standard: <https://www.omg.org/spec/BPMN/2.0>

<sup>2</sup> OMG website: <https://www.omg.org/about/>

	<p><b>(swimming) Lane:</b> is a sub-partition within a pool and will extend the entire length of the pool. Lanes are used to organise and categorise activities (Business Transactions).</p> <p>→ in e-CODEX Business Collaboration diagrams two or more swimming lanes can be used. Contrary to Business Transaction diagrams in which at all times only two swimming lanes are used.</p>
	<p><b>Start:</b> as the name implies, the Start Event indicates where a particular Process or Choreography will start.</p>
	<p><b>Sequence flow:</b> is used to show the order that activities will be performed in a process and in a choreography</p>
	<p><b>(Business) Transaction:</b> is a sub-process that is supported by a special protocol that insures that all parties involved have complete agreement.</p> <p>→ In e-CODEX Business Process models, Business Transactions can be distinct from nested Business Collaborations by the black arrow behind the Business Transaction block.</p> <p>→ The arrow show which role initiates the transaction to which partner role (left to right, or right to left). When the Business Transaction overarches more than two lanes, the left and right edges of the BT block indicate the involved roles. Any fully overarched roles are not included in the Business Transaction.</p>
	<p><b>Business Collaboration</b> (BPMN: sub-process): is a compound activity that is included within a process. It is compound in that it can be broken down into a finer level of detail through a set of sub-activities. The details of the sub-process are not visible in the Business Collaboration diagram.</p> <p>→ in e-CODEX Business Process models such 'nested Business Collaboration' is used to refer to another Business Process model, specifically created for another EU legal instrument. E.g. when in the business collaboration model for legal instrument 'xyz' the activity of servicing a document is included, the included Business Collaboration element 'Service of Documents' references the whole Business Collaboration model of the Service of Documents legal instrument.</p> <p>→ N.B. A Business Collaboration symbol is recognised by not having an arrow behind its 'activity block'.</p>
	<p><b>Fork:</b> BPMN uses the term 'fork' to refer to the dividing of a path into two or more parallel paths (so called 'AND-Split'). It is a place in the process where activities can be performed concurrently, rather than sequentially.</p> <p>→ In e-CODEX Business Process models, the fork is often used when a process is being conducted, and where one of the parties can 'intervene' by withdrawing a request, or start a parallel path for conducting a so called 'general conversation'.</p>

	<p><b>Join:</b> BPMN uses the term 'join' to refer to the combining of two or more parallel paths into one path.</p> <p>➔ In the e-CODEX Business Process models, it means that two sequence flows that have been forked from one sequence flow at an earlier stage in the process, are re-joined to continue the process as a single flow.</p>
	<p><b>Choice (in BPMN 'Gateway'):</b> is used to control the divergence and convergence of Sequence Flows in a Process and in a Choreography. Thus it will determine, branching, forking merging and joining of paths.</p> <p>➔ in e-CODEX business process models, choices are used when either 'path x' or 'path y' is to be followed. There will still be a sequential path, opposite to the 'fork' which allows for a parallel path.</p> <p>➔ the position (swimming lane) is not indicative for the role that performs the choice-event. It can be put in any swimming lane in order to minimize the (optic) complexity of the diagram.</p>
	<p><b>Process Connector:</b> this pauses the completion of Business Transaction. the connector points to another Business Transaction which must be completed after which the paused Business Transaction can trigger the responding Business Document.</p>
	<p><b>End:</b> As the name implies, the End Event indicates where a Process or Choreography will end.</p>

Symbols used in a Business Transaction workflow	
Symbol	Description
	<p>The <b>Pool</b> of a <i>Business Transaction</i> at all times has two <b>Lanes</b>. The lanes represent the <i>roles</i> that are involved in executing this particular business transaction. The left lane represents the 'requesting role' (the initiator) in accordance with the indicative arrow (left-to-right or right-to-left) of the Business Transaction symbol in the <i>Business Collaboration</i> diagram. The right lane represents the 'responding role' (the receiver and possibly the responder). A transaction can depict several Message Exchange Patterns; a 'notification' only includes one initiating message/business document and will have no response. A request will additionally include one or more responding message/business document, but in case multiple answer are modelled, only one such answer can be triggered in a particular instance of the <i>Business Transaction</i>.</p>
	<p><b>Start:</b> as the name implies, the Start Event indicates where a Business Transaction will start.</p>

	<p><b>Activity:</b> is a generic term for work that a company (authority) performs in a Process.</p> <p>→The activity refers to a '<i>Business Activity</i>' that is performed within the organisation or domain of the respective role. This Business Activity in the request role triggers an information exchange in the context of a '<i>Collaboration Activity</i>'. The Business Activity of the responding role processes the received information inside its domain and may provide a reply.</p> <p>→The <b>Activity</b> name will be direct input as 'ebMS <i>action</i> parameter' for the pMode creation.</p>
	<p><b>Sequence flow:</b> is used to show the order that activities will be performed in a process and in a choreography</p>
	<p><b>Message flow:</b> is used to show the flow of Messages between two participants that are prepared to send and receive them. In BPMN, two separate lanes in a Collaboration Diagram, will represent the two participants.</p>
	<p><b>Message:</b> is used to depict the contents of a communication between two participants ('roles').</p> <p>→in e-CODEX process models, this message refers to a specific <i>Business Document</i> (BPMN: data object). The message typically represents the XML instance of forms annexed to a EU legal instrument, any additional communications commonly agreed during the Business Collaboration design phase and may have attachments (Data Objects) supporting the exchanged information in the <i>Business Document</i>.</p>
	<p><b>End:</b> As the name implies, the End Event indicates where a Process or Choreography will end.</p> <p>→'success' is related to the successful completion of the transaction according to its design. It is not an indication that the requesting party has received a positive answer to its question. The responding partner may have rejected the request, but has successfully answered 'negatively'.</p>