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INTERNATIONAL SUPPLY CHAIN PROGRAMME DEVELOPMENT AREA
SUPPLY CHAIN MANAGEMENT AND PROCUREMENT DOMAIN

E-NEGOTIATION

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***Change Log**

Date of Change	Version	Paragraph Changed	Summary of Changes
28 Jan 2021	0.1		The 1 st draft of BRS.
24 Feb 2021	0.2		Resolved comments from team. Add the information model section.
26 Mar 2021	0.3		Improve the explanation of AOP. Change the information model. Add the glossary.
16 Apr 2021	0.4		Editorial correction. Add the annex “Legal observation”.
21May2021	0.5		Editorial correction *Reference *Other protocols
30Jul2021	0.6		Specify negotiation protocols Adapting the information model to the protocols
02Sep 2021	0.7		Editorial correction *According to the discussion through the project team at 27 th of August/2021

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***Glossary**

Term	Definition
Agreement	An agreement is simply an understanding or arrangement between two or more parties.
AI	Abbreviation for Artificial Intelligence
API	Abbreviation for Application Programming Interface
AOP	Abbreviation for Alternating-Offers-Protocol. AOP is a structured form of negotiation between two parties, in which the parties take turns in making offers. (see https://ii.tudelft.nl/nego/node/7)
BSP	Abbreviation for Buy-Ship-Pay.
Bilateral Negotiation Layer	Bilateral Negotiation Layer manages the negotiation session between the two parties.
Chain Layer	Chain Layer, manages the context of transaction across a supply chain.
Context Layer	Context Layers give background information about the session. There are 3 kinds of a Context Layers, such as a Chain Layer, an Item Layer and a Counterpart Layer.
Contract	A contract is a formal arrangement between two parties that's enforceable either in court or through arbitration. Contracts are valid when both parties accept the terms.
COP	Abbreviation for Continuous Offers Protocol COP is a protocol that enables the negotiator to offer in a row without waiting for the other party's proposal.
Counterpart Layer	Counterpart Layer, manages the context about the counterpart of a negotiation.
DX	Abbreviation for Digital Transformation. DX is the adoption of digital technology to transform non-digital or manual processes with digital processes or technology.
Item Layer	Item Layer, manages the context about what to be traded in a certain tier of the supply chain. The item can be of a product or a service.
Negotiation	A Negotiation is a process whereby parties try to resolve an issue or multiple issues in a way that meets the legitimate interests of all parties.
Negotiation Issue	Negotiation Issues are the resources or considerations that need to be resolved through Negotiation. Price, time and quantity are examples of issues.
Negotiation Offer	Negotiation Offer is a statement of the terms on which the party is willing to be bound, for example, price = 100 yen, quantity = 3, and delivery date = March 9th. Negotiation Offer may also be called as "quote" or "proposal" in some business areas. If one party sends Negotiation Offer and the other accepts it, the Negotiation reaches to an agreement, and both can't change it anymore.

Term	Definition
Negotiation Outcome	Negotiation Outcome is the information obtained after a Negotiation completes, irrespective of the Negotiation result. In case of an agreement Negotiation Outcome includes an accepted Negotiation Offer.
Negotiation Protocol	A negotiation protocol is a set of rules that govern the interactions between negotiating parties.
RFI	Abbreviation for Request For Information
RFP	Abbreviation for Request For Proposal
RPA	Abbreviation for Robot Process Automation
(Negotiation) Suggestion	Negotiation Suggestion is a statement of the terms on which the party is willing to be bound, for example, price = 100 yen, quantity = 3, and delivery date = March 9th. Unlike Negotiation Offer, even if one party sends Negotiation Suggestion and the other accepts it, the Negotiation doesn't reach to an agreement.
Suggested Direction	Suggested Direction is to present desired direction to the other party without including specific proposals, for example, whether a party favours lower price or higher price.
UMM	Abbreviation for UN/CEFACTs Modelling Methodology. UMM is a UML modelling approach to design the business services that each business partner must provide to collaborate.
WAOP	Abbreviation for Withdrawable Alternating Offers Protocol WAOP is the alternating offers protocol with the feature that allows the withdrawing of the offer once proposed.
WCOP	Abbreviation for Withdrawable Continuous Offers Protocol WCOP is the continuous offers protocol with the feature that allows the withdrawing of the offer once proposed.

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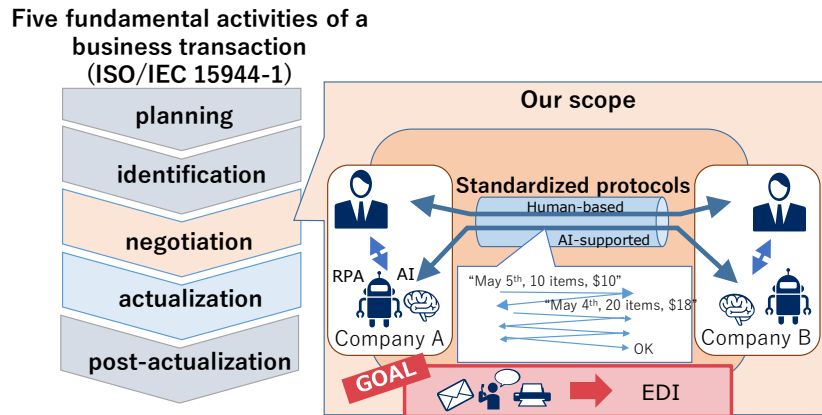
61 1. Preamble

62 A general business transaction consists of five fundamental activities: planning, identification,
63 negotiation, actualization, and post-actualization (ISO/IEC 15944-1, the UN/CEFACT UMM User
64 Guide of 2003) as described in Figure 1-1. Prior to the actualization phase, which includes an exchange
65 of purchase order information (EDI) between parties, human staffs negotiates the transaction
66 conditions via email or telephone. However, advances in digital transformation (DX), artificial
67 intelligence (AI) and robot process automation (RPA) are changing these negotiations. Therefore, the
68 semantics of the negotiation process and of the exchanged information should be standardized.

69 The negotiation process is entering a DX era, where both buyer and seller have developed electronic
70 systems. From the buyer side, the system often allows them to develop their own electronic bidding
71 system and bid comparison system. From the seller side, the system has to connect to multiple
72 prospective buyer systems, each with different semantics. Standardized semantics would allow the
73 seller to not only reduce costs, but also set up a decision-making system defining which item(s) should
74 be sold to which company(ies).

75 In addition to this DX, AI and RPA can ultimately assist in achieving better negotiating conditions.
76 Current human-based negotiations require a human decision at each proposal; therefore, message
77 exchange can increase exponentially to reach the best solution among possible conditions of the
78 agreement. With an AI negotiator, the exchange can be automated allowing to reach better conditions

79 faster. The final approval may still require human approval, but this approach achieves business
 80 efficiency and optimality.
 81



82
 83
 84 Figure 1-1 Five fundamental activities of a business transaction and project scope
 85

86 2. References

- 87 · ISO/IEC DIS 15944-1 Information technology – Business operational view
- 88 – Part 1: Operational aspects of open-edi for implementation
- 89 · UML Profile for UN/CEFACT’s Modeling Methodology (UMM) Base Module Technical
- 90 Specification – Version 2.0, 01 April 2011
- 91 · UML Profile for UN/CEFACT’s Modeling Methodology (UMM) Foundation Module Technical
- 92 Specification – Version 2.0, 01 April 2011
- 93 · Core Components Technical Specification – Version 2.01, 15 November 2003
- 94 · Core Components Business Document Assembly Technical Specification
- 95 – Version 1.0, 27 June 2012
- 96 · (BRS) Electronic Tendering International Standardization – Version 2.0, 27 April 2007
- 97 · (BRS) Cross Industry Scheduling Process – Version 2.0, 10 July 2017
- 98 · (BRS) BUY – SHIP – PAY Reference Data Model – Version 1.0, 13 August 2019
- 99 · (BRS) International Forwarding and Transport Message BOOKING
- 100 – Version 1.0, 19 October 2020

101
 102 3. Objective

103 The purpose of this BRS is to establish semantic standards for coordination, negotiation procedures
 104 and progress status related to the commercial transaction of business. Commercial transaction
 105 conditions of negotiation targets are present in various business area such as the logistics and
 106 manufacturing. It should conform to the information model defined by the standard specifications of
 107 UN/CEFACT.

108 This BRS provides a standard for the information model related to the process for adjusting and
 109 negotiating the terms of the transaction and a meaningful interpretation of its progress. The adoption
 110 of the standard will allow to be agnostic about the nature of the parties involved in the business trade.
 111

112 4. Scope

113 This project aims to define the business processes and data exchange requirements related to electronic
 114 Negotiations for the agreement. This will concentrate specifically on protocols and data formats rather
 115 than internal decision processes. In this way, a human negotiator, an AI negotiator, or a human
 116 negotiator assisted by an AI/robot support should use the same base semantic protocols.

117 Although the requirements assume the EDI used by people, AI/RPA etc. based message exchanges are
 118 taken into consideration, AI/RPA itself is outside of the scope.
 119 The attributes of target values for Negotiation are only numbers, dates, and identifiers for selection. It
 120 does NOT include natural language attribute or their analysis.
 121

122 5. Business Requirements

123 This BRS covers common requirements for the Negotiation process, and does NOT cover specific
 124 business requirements.

125 5.1. Business Requirements Elaboration

126 5.1.1. Negotiation Protocol Stack

127 Various negotiation use cases can be comprehensively modelled by the Negotiation Protocol Stack,
 128 where each layer has a distinct meaning in a supply chain. Each layer has several protocols or several
 129 internal message handling methods so that the appropriate one can be chosen at each layer to meet the
 130 requirements of the applicable business area. This design will ensure that the requirements for various
 131 negotiations can be met with the same protocol stack.
 132

133 The protocol stack consists of a Bilateral Negotiation Layer and Context Layers. **Error! Reference**
 134 **source not found.**5.1-1 reports a graphical description of the protocol stack. The Bilateral Negotiation
 135 Layer manages the negotiation session between the two parties. Context Layers give background
 136 information about the session. In particular:

- 137 • Chain Layer, which is the highest Context Layer, manages the context of the transaction across a
 138 supply chain. Each party in the chain has a customer-side and/or a supply-side. At the edge of a
 139 supply chain, it only has the one side;
- 140 • Item Layer, manages the context about what to be traded in a certain tier of the supply chain. The
 141 item can be of a product or a service. A supply-side may have several items as parts of an item;
- 142 • Counterpart Layer, which is the lowest Context Layer, manages the context about the counterpart
 143 of a negotiation. For each item, in Counterpart Layer, distinct negotiation sessions with different
 144 counterparts can be treated.
 145

146 In this way, every Context Layer has plurality in a different meaning, and from the plurality derives
 147 design options on timing issues which are synchronous or asynchronous. In the protocol stack, higher
 148 layers are designed independent from lower layers so that the combination can be easily implemented.
 149

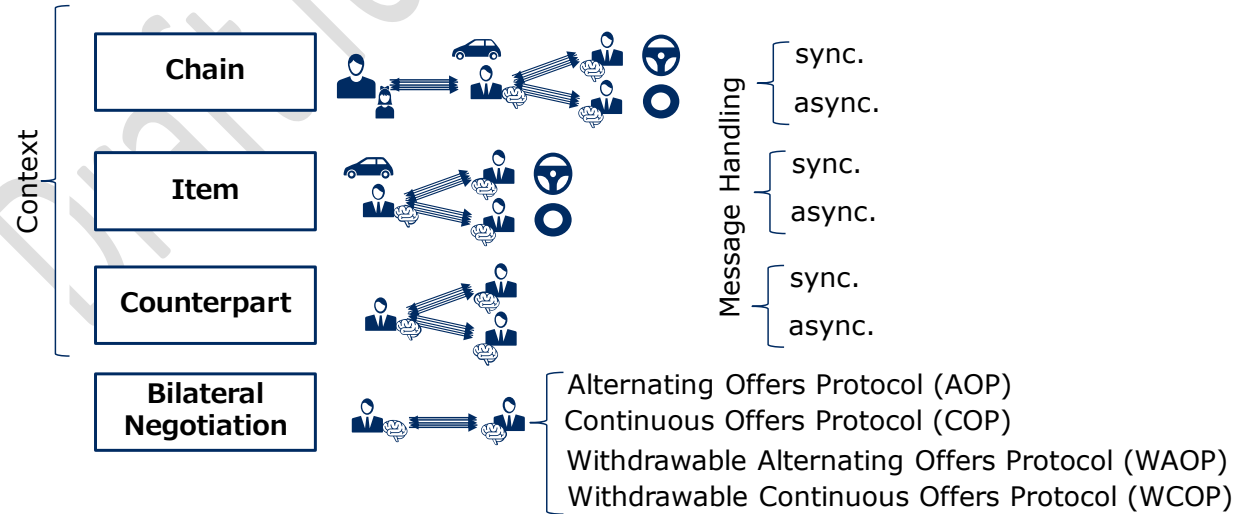


Figure 5.1-1 Protocol stack

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154 In the following paragraphs we will describe each layer in details.
155

156 5.1.1.1. Bilateral Negotiation Layer

157 The Bilateral Negotiation Layer manages a negotiation session with a counterpart. Four protocols are
158 prepared for this layer due to two design options about offering that is taking turn or not and that is
159 withdrawable or not. Taking turn of offers is realized by adopting one among the two different
160 strategies. They are implemented through two different protocols:
161

- 162 • Alternating Offers Protocol:

163 It is a simple protocol that implement the alternation of offers. If one side proposes, the turn will shift to
164 the other party and another proposal cannot be made until the other party proposes it. The requirements for
165 this protocol will be mainly determined by mechanical negotiations such as AI/RPA. In mechanical
166 negotiations, it is thought that there might be few human errors. So, the protocol can be simple and that can
167 facilitate mechanical judgment.
168

- 169 • Continuous Offers Protocol:

170 It is a protocol that enables the negotiator to offer in a row without waiting for the other party's
171 proposal. The withdrawal of the offer is not possible in this protocol, if there are chances of
172 withdrawal than WCOP can satisfy that requirement.
173

- 174 • Withdrawable Alternating Offers Protocol:

175 It is the AOP with the feature that allows the negotiator to withdraw the offer once made. Although
176 the negotiation proceed by taking turns to propose the offers.
177

- 178 • Withdrawable Continuous Offers Protocol:

179 The requirements for this protocol are determined mainly by assuming negotiations between humans.
180 Human proposals contain personal errors and take time. So, in Negotiation protocols, flexible protocols
181 are required that can handle the following cases:

182 - Withdrawal of the proposal once made.

183 - Before the other party can make an alternative proposal, present your own alternative.

184 Anytime Offering Protocol with Withdraw is a protocol that satisfies these requirements.
185

186 Figure 5.1.1.1 depicts the example of the protocols in Bilateral Negotiation Layer.
187

188 Other than the timing issue, the Bilateral Negotiation Protocol shall specify an exit condition such as
189 a deadline. The first option is if such deadline exists or not. If it exists, the second option is if it is
190 represented in time or in a number of turns. A concrete number to specify the length is also specified.
191 In addition, the Bilateral Negotiation Protocol shall specify a timeout condition for each offer.
192

193 These designs basically do not depend on whether a negotiator is a human or a machine such as AI or
194 RPA. However, the Alternating Offer Protocol may be useful if both-sides are AIs and the
195 Withdrawable Continuous Offers Protocol may be useful if at least one-side is human. These are so
196 because humans may make a mistake during a negotiation. The withdrawable protocol is also useful
197 in the case of the existence of asynchronous message handling in upper Context Layers because the
198 use of asynchronous message handling is speculative to some extent.
199

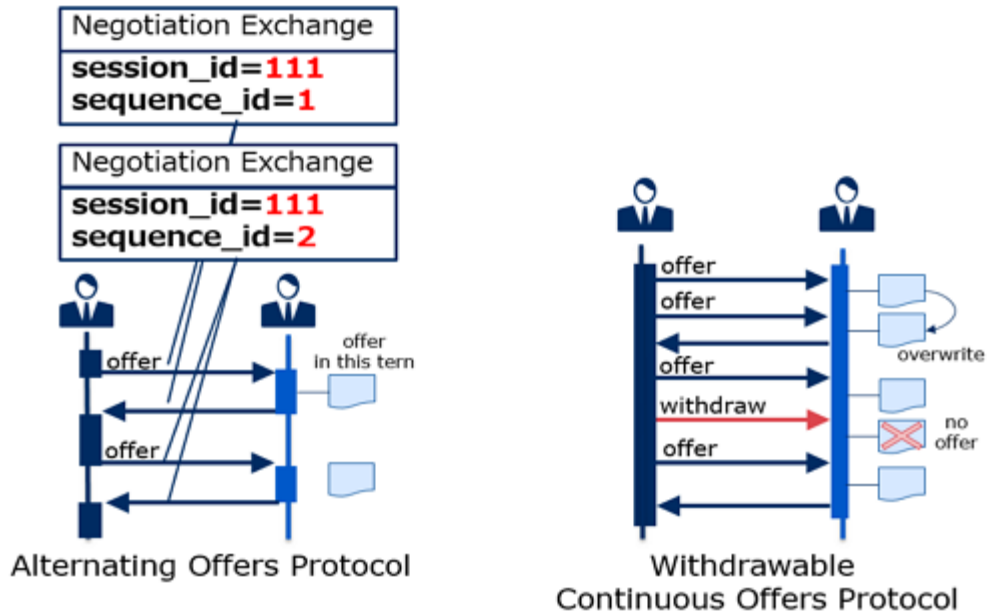


Figure 5.1.1.1 Example of Bilateral Negotiation Layer

5.1.1.2. Chain Layer

When negotiating across tiers in the supply chain, there might be a situation where a party negotiates with its suppliers while negotiating with its customers. The “chain_id” is optional, though if required it can be identified in combination with the “session_id”. In such cases, relationships such as synchronous/asynchronous should be implemented, as described in the Item Layer.

Figure 5.1.1.2 depicts the example of the Chain Layer.

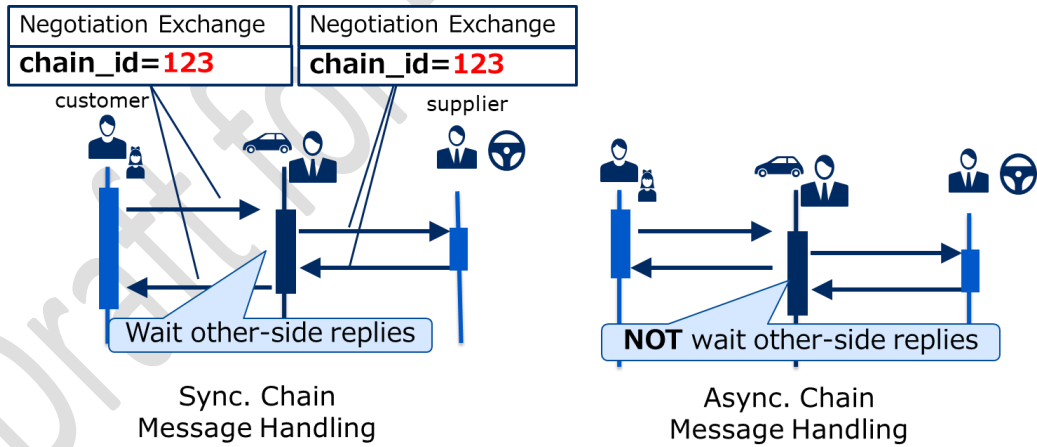


Figure 5.1.1.2 Example of Chain Layer

5.1.1.3. Item Layer

Negotiations between multiple groups can also have synchronous/asynchronous relationships. For example, when negotiating the steering wheel and the wheels that are parts of an automobile at the same time, it is possible that these different parts can be negotiated asynchronously and these same parts may be negotiated synchronously as described in example represented in Figure 5.1.1.3 Example of Item Layer.

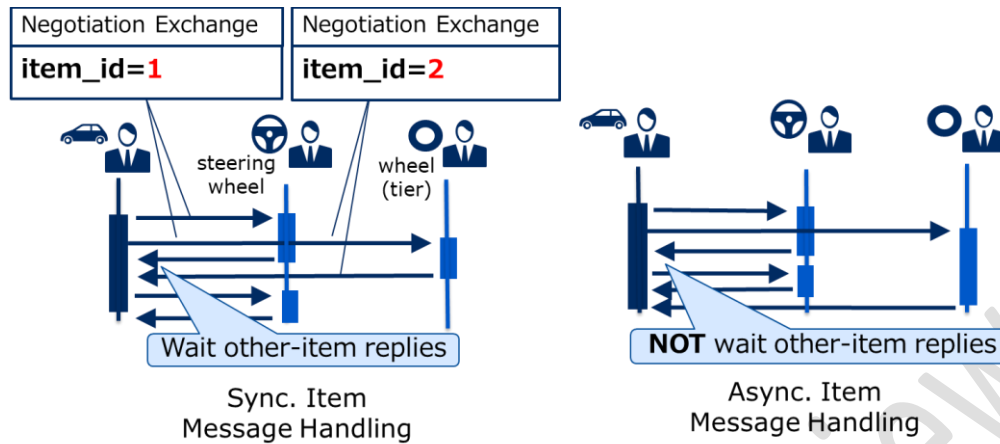


Figure 5.1.1.3 Example of Item Layer

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222 5.1.1.4. Counterpart Layer

223 When negotiating with multiple negotiating parties, one may be trying to maintain the same proposal
224 status as for all negotiating partners, or one may negotiates with each partner independently. They are
225 implemented through two different protocols:

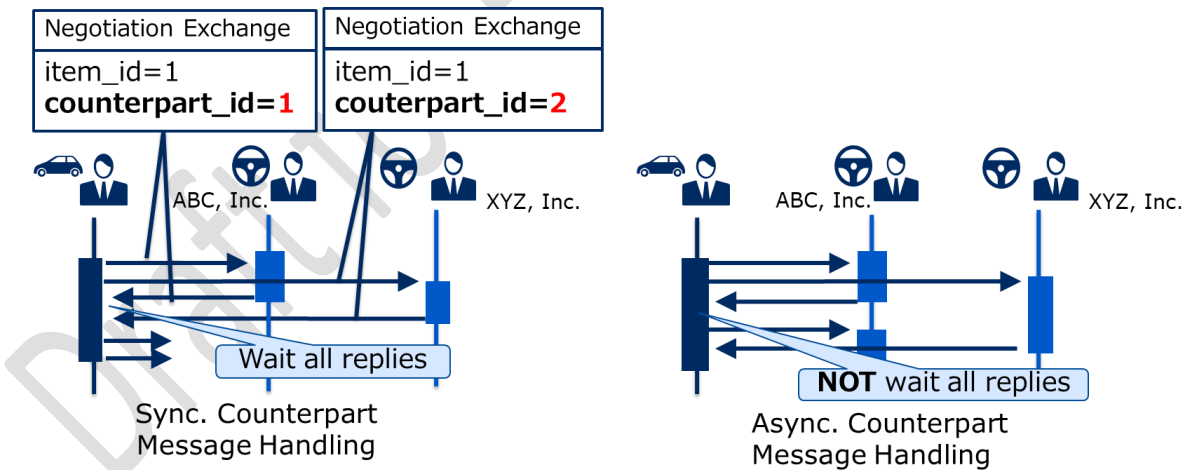
226
227 Synchronous Protocol

- 228 • It constrains the transition state for multiple Sessions. In particular, it is managed such that the proposed
229 state is in accordance with the state of the proposal made by each party.

230
231 Asynchronous Protocol

- 232 • It does NOT constrain the transition state of the multiple Sessions to be handled.

233
234 Figure 5.1.1.4 describes the examples of the protocol in the Counterpart Layer.



235
236
237
238 Figure 5.1.1.4 Example of Counterpart Layer

239
240 5.1.1.4.1. Competitive Protocol

241 Competitive Protocol constrains protocol state transitions assuming that there is a conflict between
242 multiple parties. For example, when one party declare that they want to select only one company and
243 start the negotiations at that time it is necessary to control so that they don't end up agreeing with more
244 than one party.

245
246 5.1.1.4.2. Collaborative Protocol
247 Collaborative Protocol provides a protocol for exchanging information to encourage collaboration
248 when there is a cooperative relationship between the parties. For example, in order to purchase a total
249 of 100 items from two different companies together, there are cases when negotiation with both the
250 companies are required. The information exchange here, refers to the following:
251 - A business operator with total volume will spread the information obtained from one party (with
252 explicit permission) to the other.
253
254 5.1.2. Negotiation Outcome
255 How to deal with the outcome of negotiations is basically NOT in the scope of this BRS. However,
256 since the outcome of the negotiations is also related to understanding the requirements assumed for
257 negotiations, therefore only issues will be arranged for reference in this BRS. According to the five
258 activities of business-to-business transactions stated in ISO/IEC 15944-1, actualization comes after the
259 negotiation process. This actualization assumes that the agreed terms of commerce are reflected in
260 agreements as well as in the orders sent and received by EDI. Therefore, it is assumed that the outcome
261 of the negotiation is the same as the information that is used in the agreement and EDI. However, this
262 BRS doesn't specify whether or not these are allowed to differ, or whether the agreement is valid in
263 the case of any interaction. The reason is that these seem to depend on the granularity of the
264 negotiations and agreements described later. However, in practice, it is necessary for the two parties
265 to agree in advance to negotiate the pre-provisions described in the next section.
266 There are few issues on the matter of legal opinion regarding the agreement associated with this
267 agreement and the exchange of information on the occurrence of such agreement. These will be
268 discussed in the Appendix. In addition, as a result of the negotiations, advance provisions for the next
269 negotiation may be decided. This will be described in the next section.
270
271 5.1.3. Negotiation Protocol Determination
272 In negotiating with EDI, parties must agree in advance on the protocols they will use. This prior
273 recognition is also not in the scope of this BRS. However, it is assumed that it is defined in one of the
274 latter three.
275
276 5.1.3.1. Publication from Initiator
277 When a company issues RFI, RFP, etc. for the procurement of goods and services, the issuer may be
278 seen as those who have set rules for negotiation and coordination. For example, when there is no
279 underlying agreement for the basic agreement etc., this method is often adopted.
280
281 5.1.3.2. Previous Agreement
282 While the basic agreement exists, the content and orders might be defined in the basic agreement for
283 the coordination and negotiation between companies. Thus, in the previous agreement, there is a
284 possibility that the rule for the next negotiation may be defined as described in Figure 5.1-2.
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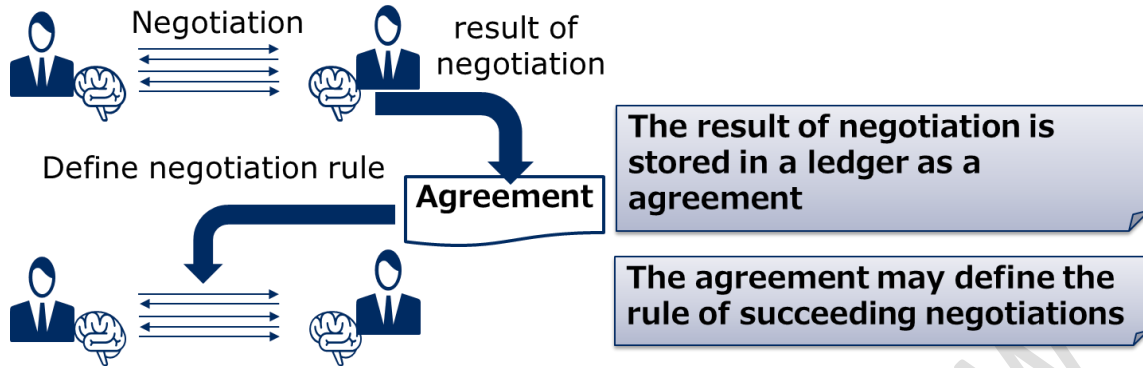


Figure 5.1-2 Relation of the previous negotiation result and the next negotiation rule

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5.1.3.3. Business Practice

As a business practice, if certain protocols have already been used, they could effectively be considered as agreed. In particular, for the granularity of the negotiations described in the next section, an operation seems to be done by the adjustment of a short period of time such as physical timing adjustment.

5.1.4. Granularity of Negotiation

There are various negotiations and adjustments as of the granularity of the negotiations, from negotiating the basic contract to adjusting the timing of physical delivery. This section organizes requirements for each negotiation and coordination. However, this BRS does not provide a standard for such granularity, nor does it depend on a specific granularity. An example of the Negotiation Granularity is described in Figure 5.1-3.

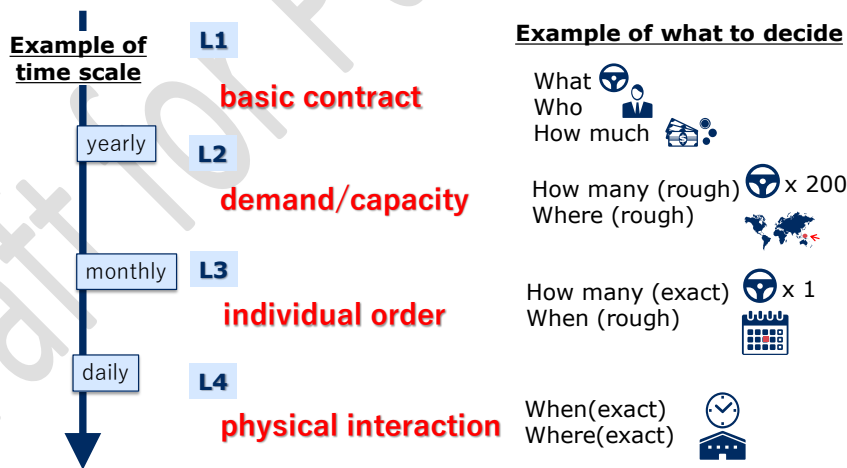


Figure 5.1-3 Example of the negotiation granularity

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5.1.4.1. Basic Contract

It is a basic contract between the companies, and it is a document that subjects to signature or electronic authentication. For example, a long-term agreement that continues on a yearly basis.

5.1.4.2. Demand and Capacity Adjustment

313 An unofficial announcement on the supply and demand exchanged between companies. Whether the
 314 information communicated there or agreed upon becomes an obligation will vary depending on
 315 industry practices. For example, this includes medium-term agreements such as quarter-term
 316 agreements.

317
 318 5.1.4.3. Individual Order

319 Individual commerce related to goods, services, etc. Specific prices, quantities, delivery dates, etc. are
 320 negotiated and adjusted. It varies from industry to industry, but this is mainly a daily and weekly
 321 agreement.

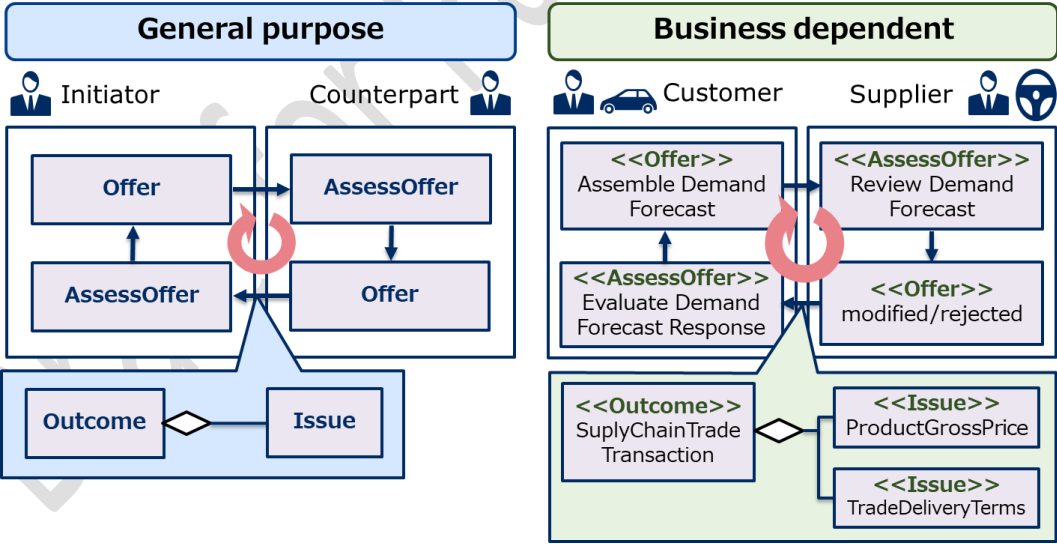
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 323 5.1.4.4. Physical Interaction

324 Adjustments to the timing of delivery of goods and services. This is an agreed adjustment in hours and
 325 minutes of the day.

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 327 5.1.5. General purpose representation and Stereotype

328 This BRS defines the semantics of Negotiation protocols available for general purposes. In the
 329 application of general-purpose APIs and message formats, it is necessary to re-implement the APIs
 330 and message formats that are different from those already defined and used in EDI (Electronic Data
 331 Interchange) for each business area.

332 Therefore, in this BRS, to define them independently from a specific business, the functions and
 333 information model-based Negotiation are defined as General purpose (described on the left side of
 334 Figure 5.1-4 Negotiation functions and information models). The existing provisions of each business
 335 area presents a framework to be re-defined as a stereotype. Business dependent (described on the right
 336 side of Figure 5.1-4) is the instance sample of the General purpose.



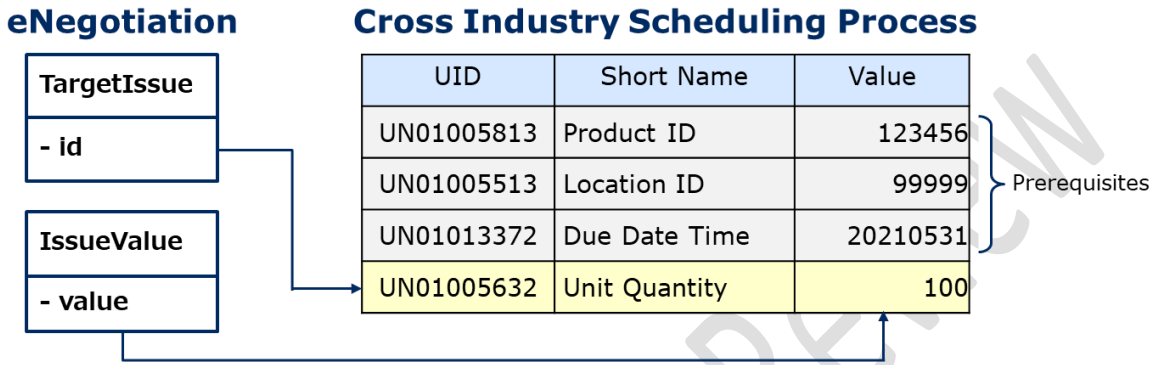
340
 341 Figure 5.1-4 Negotiation functions and information models
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343 For example, in the Kanban scenario in Cross Industry Scheduling, adjustments to Demand Forecast
 344 are defined, which can be considered as Negotiations. This BRS also presents a method for granting a
 345 stereotype to a BRS that already exists. A detailed example of this is described in the Implementation
 346 Guide.
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5.1.6. Specification of Target Issues

At the start of Negotiations, the terms of commerce, which consist of its ID and Value, are offered and notified. If the terms are already specified as BRS, the pre-defined identifiers are notified as ID. In addition, the ID and the Value of negotiable terms are set to the TargetIssue and the IssueValue, respectively. In eNegotiation, the IssueValue of the TargetIssue is negotiated.



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Figure 5.1-5 Example of the information model of TargetIssue

In Figure 5.1-5 , the “Unit Quantity” specified in “TargetIssue” is a negotiable item, which represents that the value can be changed during negotiation. In contrast, “Product ID”, “Location ID”, and “Due Date Time”, which are not specified in TargetIssue, represents non-negotiable items and prerequisites whose values cannot be changed during negotiations.

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5.2. Information Flow Definition

5.2.1. Negotiation Protocols

5.2.1.1. Bilateral Protocol

5.2.1.1.1. Alternating Offers Protocol

The actors included in alternating Negotiations between the two parties are the **Initiator** and the **Counterpart** as described in Figure 5.2-1. Each has functions called GenerateOffer and AssessOffer. GenerateOffer presents potential consent proposals to the other party. AssessOffer evaluates a proposed offer and decides whether to accept, reject or end the Negotiation. In addition, if the prescribed deadline is passed, the Negotiations are regarded as Disagreed. This deadline is specified as real time or as the number of steps. When the Negotiation completes, the result is notified to both the parties.

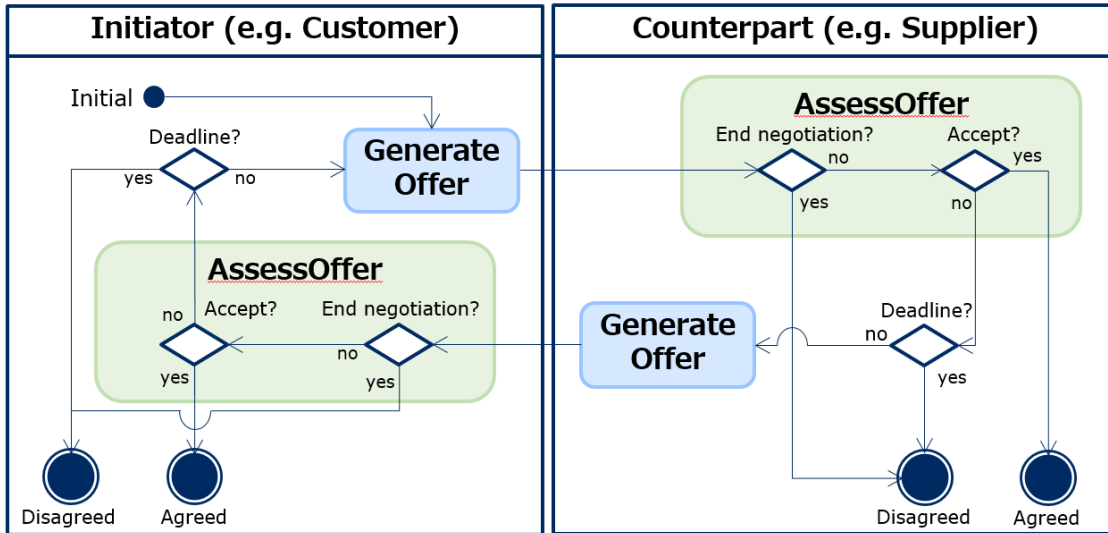


Figure 5.2-1 Alternating Offers Protocol

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The GenerateOffer activity can generate the following three types of messages:

- Offer: This message includes the contents which means if the other party accepts this offer, the status changes into agreed status.
- Suggestion: It is the one which is accepted but is not seen as an agreement, however it presents the other party with the value the sender desires
- Suggested Direction: It is to present the desired direction to the other party without including specific proposals.

The detailed explanation of these messages are in Fig. 5.2-2 Negotiation Core Model.

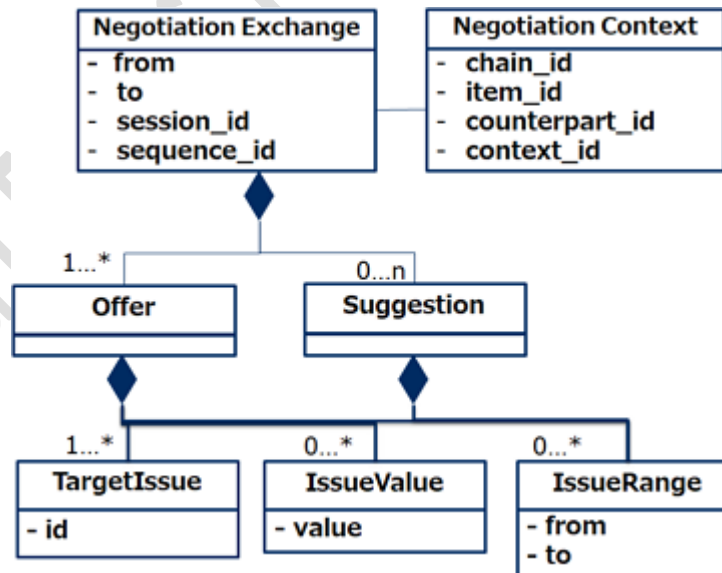


Figure 5.2-2 Negotiation Core Model

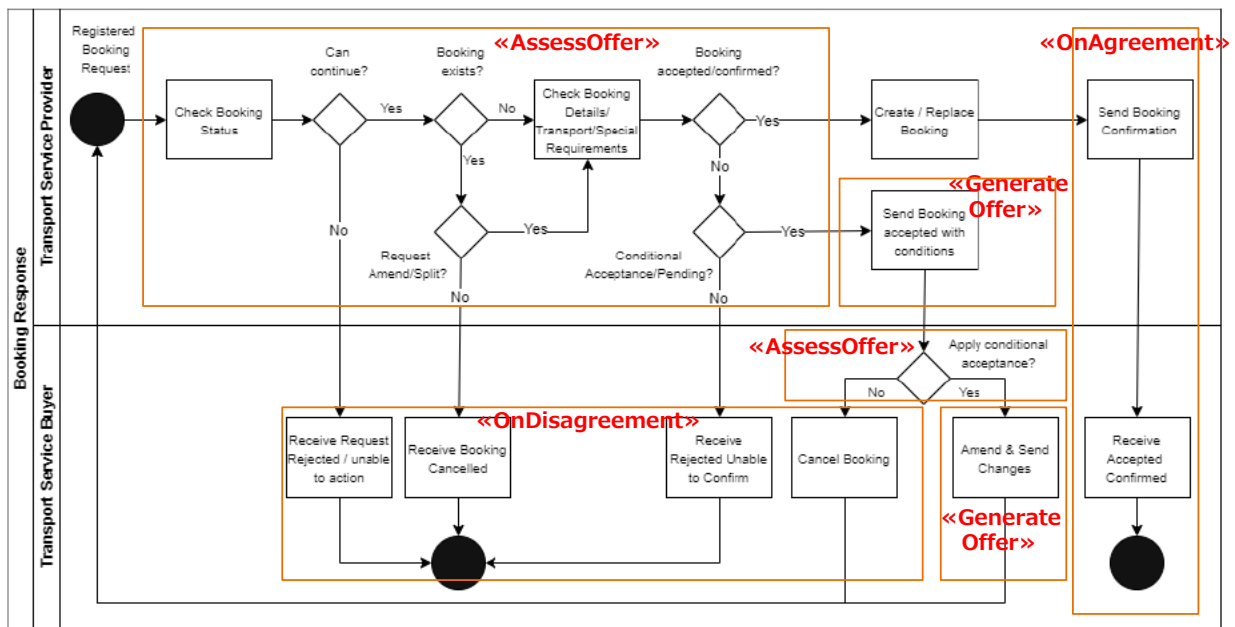
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Negotiation Message has some attributes to identify individual exchanged messages uniquely, for example, 'session_id', 'sequence_id', and so on. It includes Offer and Suggestion messages, and these

396 messages include TargetIssue, IssueValue, and IssueRange respectively. TargetIssue identifies the
 397 items to be negotiated. IssueValue specifies a concrete value. IssueRange specifies the upper limits
 398 (to) and lower limits (from) of the IssueValue and can imply the direction of the desired value, such
 399 as wanting a larger value to be specified. For example, if only the upper limit is specified, it implies
 400 that a smaller value is desirable. It is assumed that TargetIssue is used in a set with one of the
 401 IssueValue or IssueRange. If only TargetIssue is specified, it may be considered that all ranges are
 402 specified.

403
 404 The following activity diagram is described in BRS 'IFT Booking (chapter 5.4.1 Business Transaction
 405 View – Transactions and Authorized Roles)'.
 406 The red coloured frames and stereotypes in the diagram describes the functions of AOP.

407 Existing business flows are handled like a negotiation (repeating <<GenerateOffer>> and
 408 <<AssessOffer>> between two or more actors).
 409



410
 411
 412 Figure 5.2-3 Booking activity diagram described in BRS 'IFT Booking
 413
 414

415 5.3 Information Model Definition

416 There are two kinds of eNegotiation messages as follows.

- 417 – Negotiation initiate message
- 418 – Negotiate message

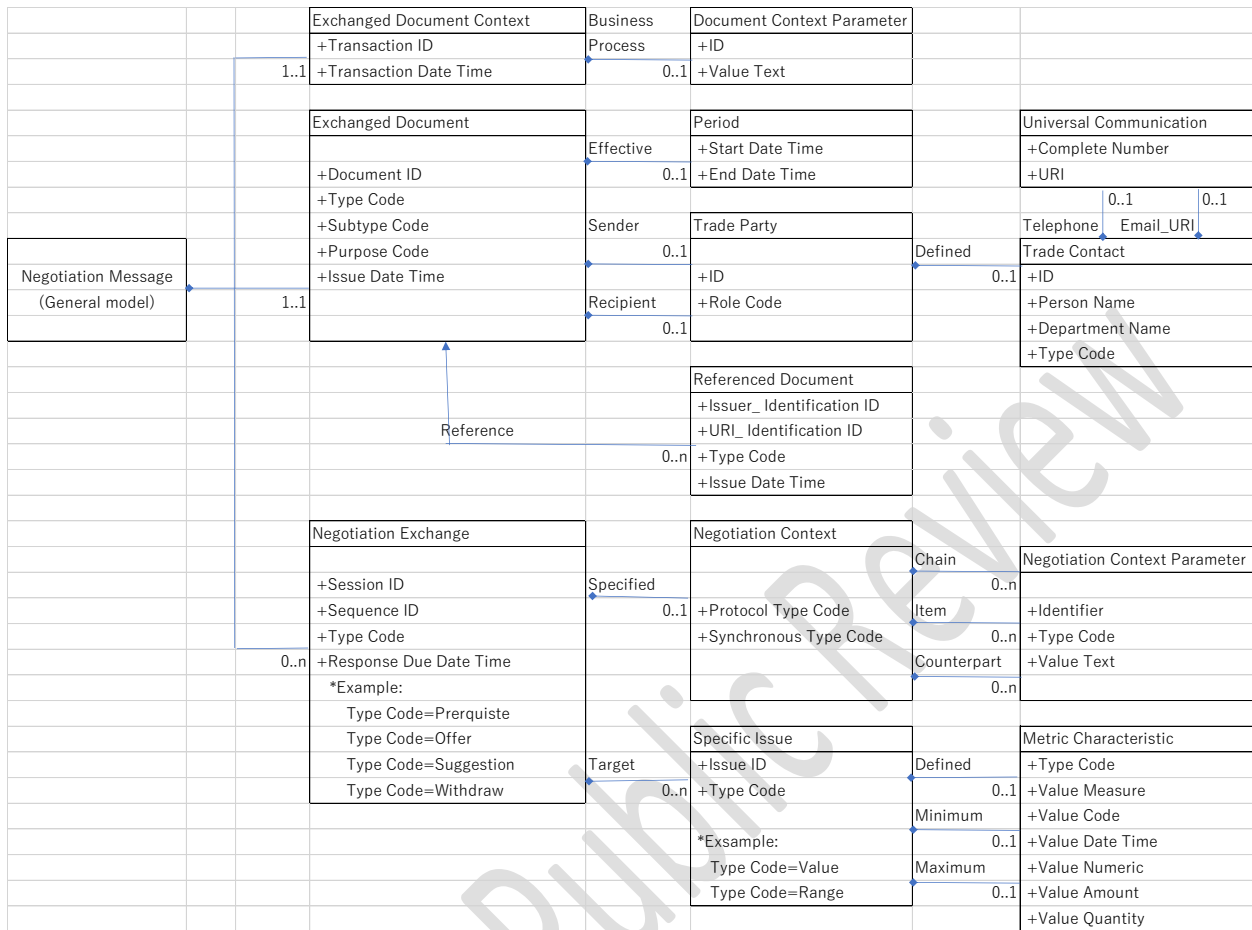
419 The negotiation is challenged based on the prerequisite condition specified by the preceding
 420 negotiation initiate message.

421 5.3.1 General negotiation information model

422 The figure 5.3-1 shows the general information model used for a negotiation. All the information
 423 components are specified for a Negotiation initiate message and a Negotiate message.
 424
 425

426 5.3.1.1 Conceptual information model

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Figure 5.3-1 General negotiation information model

432
433 5.3.1.2 Message assembly

Table 5.3-1 Message assembly of the Independent Negotiation message

Type	UID	Short Name	Definition	Cardinality
MA		Negotiation Message	A message used for negotiating and/or specifying the prerequisite condition for the negotiation.	
ASMA		Exchanged Document Context	The set of context parameters specified for a use of this message assembly.	1..1
ASMA		Exchanged Document	A collection of data for a piece of document that is exchanged between two or more parties for this message assembly.	1..1
ASMA		Negotiation Exchange	An offer exchanged between parties for a business negotiation in this message assembly. This ASMA also used for specifying the prerequisite condition for the following negotiation.	0..n

437
438
439 5.3.1.3 Message core component

Table 5.3-2 Message core component of the Independent Negotiation message

Type	UID	Short Name	Definition	Cardinality
ABIE	UN01003540	Exchanged Document Context	The scenario or setting of an exchanged document, such as its business process application context.	
BBIE	UN01003541	Transaction ID	The identifier of a specified transaction in this exchanged document context.	1..1
BBIE	UN01012761	Processing Transaction Date Time	The date time of the processing of a transaction for this exchanged document context.	0..1
ASBIE	UN01003542	Business Process Parameter	A business process context parameter specified for this negotiation, such as "Parts procurement", "Cargo space request".	0..1
ABIE	UN01004852	Document Context Parameter	A feature that is fixed for a particular document context.	
BBIE	UN01004853	ID	The unique identifier of this document context parameter.	0..1
BBIE	UN01004854	Value Text	The value, expressed as text, of this document context parameter.	0..1
ABIE	UN01002487	Exchanged Document	A collection of data for a piece of written, printed or electronic matter that is exchanged between two or more parties.	

BBIE	UN01002488	Document ID	The unique identifier of this exchanged document.	0..1
BBIE	UN01002491	Type Code	The code specifying the type of exchanged document.	0..1
BBIE	UN01003561	Purpose Code	A code specifying the purpose of this exchanged document, such as request or cancelled.	0..1
BBIE		Subtype Code	The code specifying the Subtype of exchanged document, such as negotiation or initiation.	0..1
BBIE	UN01002493	Issue Date Time	The date, time, date time or other date time value for the issuance of this exchanged document.	0..1
ASBIE	UN01003578	Effective Period	The specified period within which this exchanged document is effective.	0..1
ASBIE	UN01003587	Sender Trade Party	The party that sends this exchanged document.	0..1
ASBIE	UN01004889	Recipient Trade Party	A trade party that receives this exchanged document.	0..1
ASBIE	UN01002498	Referenced Document	Other documents referenced by this exchanged document, such as for specifying the prerequisite condition.	0..n
ABIE	UN01001270	Period	A specified period of time.	
BBIE	UN01001274	Start Date Time	The date, time, date time or other date time value for the start of this specified period of time.	0..1
BBIE	UN01001275	End Date Time	The date, time, date time or other date time value for the end of this specified period of time.	0..1
ABIE	UN01004594	Trade Party	An individual, a group, or a body having a role in a trade business function.	
BBIE	UN01004595	ID	A unique identifier of this trade party.	1..1
BBIE	UN01004599	Role Code	A code specifying the role of this trade party.	0..1
ASBIE	UN01004602	Defined Contact	A trade contact defined for this trade party.	0..1
ABIE	UN01001640	Trade Contact	A person or a department that acts as a point of contact with another person or department in a trading relationship.	
BBIE	UN01001641	ID	The unique identifier for this trade contact.	0..1
BBIE	UN01001642	Person Name	The name, expressed as text, of this trade contact person.	0..1
BBIE	UN01001643	Department Name	The name, expressed as text, of the department to which this trade contact belongs within an organization.	0..1
BBIE	UN01001644	Type Code	The code specifying the type of trade contact.	0..1

ASBIE	UN01004564	Deprecated Telephone	The telephone communication information for this trade contact.	0..1
ASBIE	UN01004569	Deprecated URI	The email URI communication information for this trade contact.	0..1
ABIE	UN01001252	Universal Communication	The exchange of thoughts, messages, or information, as universally exchanged by speech, signals, writing, or behaviour between persons and/or organizations.	
BBIE	UN01001256	Complete Number	The text string of characters that make up the complete number for this universal communication.	0..1
BBIE	UN01001253	URI	The Uniform Resource Identifier (URI), such as a web or an email address, for this universal communication.	0..1
ABIE	UN01001569	Referenced Document	The document is referenced by ID or URI designating the document.	
BBIE	UN01001570	Issuer Assigned ID	The issuer assigned identifier for this referenced document.	
BBIE	UN01001571	URI Identification ID	The unique Uniform Resource Identifier (URI) for this referenced document.	
BBIE	UN01001577	Type Code	The code specifying the type of referenced document.	
BBIE	UN01001572	Issue Date Time	The date or date time for the issuance of this referenced document.	
ABIE		Negotiation Exchange	An Offer exchanged between parties for a business negotiation.	
BBIE		Session ID	The identifier of the session for this negotiation .	1..1
BBIE		Sequence ID	An identifier for the sequence of this negotiation exchange.	0..1
BBIE		Type Code	The code specifying a type of exchange offer, such as Offer, Suggestion or Withdraw.	1..1
BBIE		Response Due Date Time	The date or date time of the response deadline.	0..1
ASBIE		Specified Negotiation Context	The context specified for the negotiation exchange.	0..1
ASBIE		Target Specific Issue	The specific issue targeted for the negotiation exchange.	0..n
ABIE		Negotiation Context	The scenario or setting of a negotiation protocol.	
BBIE		Protocol Type Code	The code specifying the type of the protocol, such as “Alternating Offer Protocol”, “Continuous Offer Protocol”, “Withdrawal Alternating Offer Protocol”, “Withdrawal Continuous Offer Protocol”.	0..1

BBIE		Synchronous Type Code	The code specifying the type of the synchronous, such as “Synchronous”, “Asynchronous”.	0..1
ASBIE		Chain Negotiation Context Parameter	A negotiation context parameter for the chain, such as a supply chain.	0..n
ASBIE		Item Negotiation Context Parameter	A negotiation context parameter for the item, such as a product, a service.	0..n
ASBIE		Counterpart Negotiation Context Parameter	A negotiation context parameter for the counterpart.	0..n
ABIE		Negotiation Context Parameter	A feature that is fixed for a particular negotiation context.	
BBIE		Identification	The identification of this negotiation context parameter.	0..1
BBIE		Type Code	The code specifying the type of this negotiation context parameter.	0..1
BBIE		Value Text	The value, expressed as text, of this negotiation context parameter.	0..1
ABIE		Specific Issue	A specific topic for debate.	
BBIE		Issue ID	The identifier of this specific issue.	0..1
BBIE		Type Code	The code specifying the type of this specific issue, such as “Value”, “Range”.	0..1
ASBIE		Defined Metric Characteristic	The metric characteristic defined for this specific issue.	0..1
ASBIE		Minimum Metric Characteristic	The minimum metric characteristic for this specific issue.	0..1
ASBIE		Maximum Metric Characteristic	The maximum metric characteristic for this specific issue.	0..1

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5.3.2 Negotiation initiate message

The negotiation initiate message specifies the prerequisite conditions for the target negotiation. There are two types of the initiate message as follows.

- Initiate message with reference document
- Initiate message specifying the prerequisite condition

5.3.2.1 Initiate message with reference documents

The prerequisite condition for the negotiation can be defined specifying the reference documents, such as a quotation message, a tendering message and a scheduling message.

The referenced messages are specified by the referenced message identification which has been sent independently or the URI identification by which the message is registered.

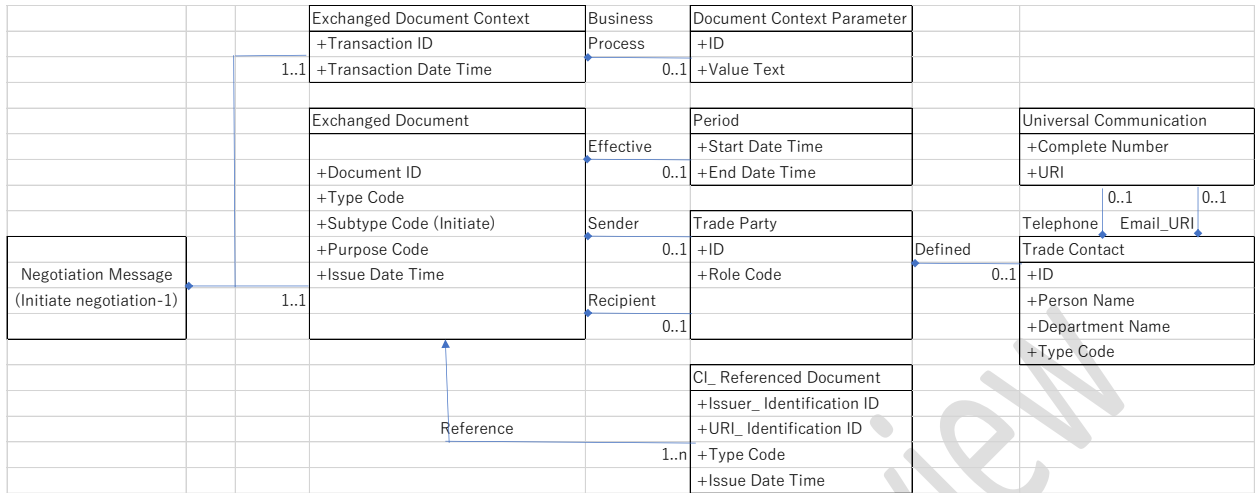


Figure 5.3-2 Initiate Message with reference document

5.3.2.2 Initiate message specifying the prerequisite condition

The prerequisite conditions based for the negotiation are defined in the negotiation exchange offer. When the type code for the negotiation exchange offer is specified “prerequisite”, the negotiation issue values can be specified for the prerequisite condition.

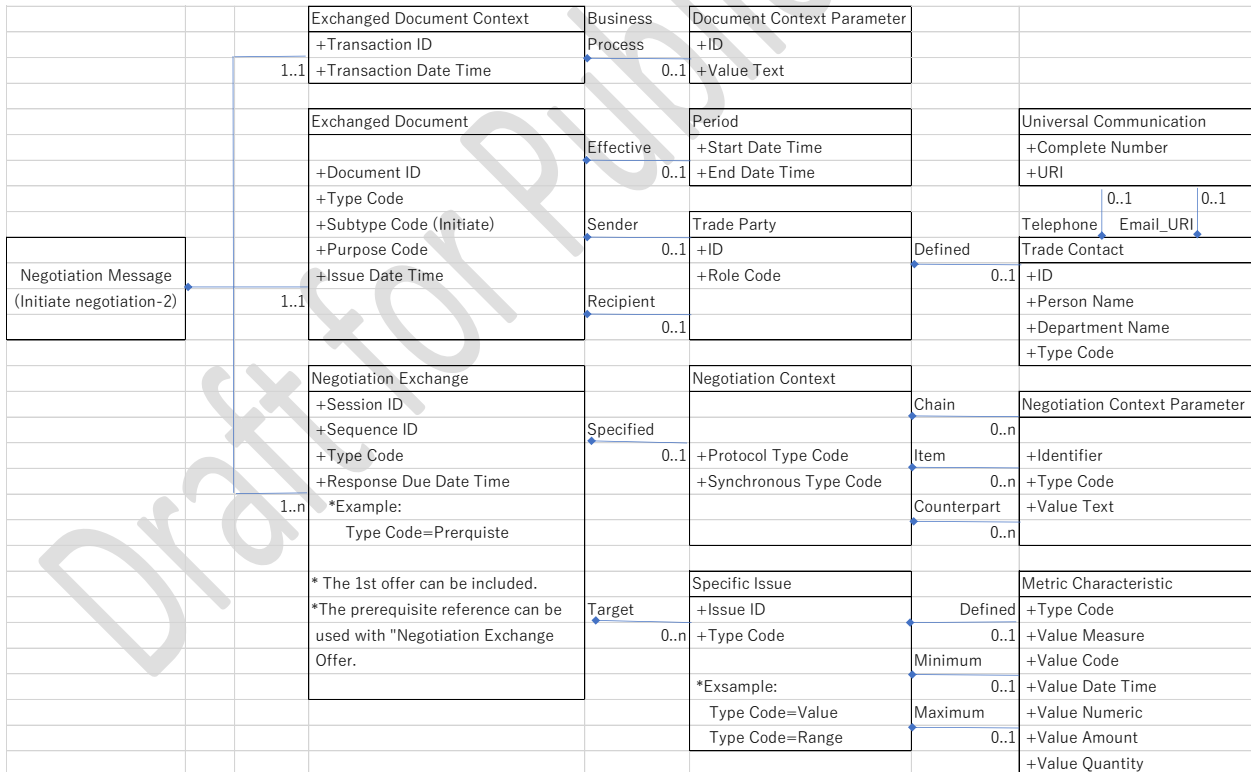


Figure 5.3-3 Initiate message specifying the prerequisite condition

The referenced documents for the prerequisite condition can be also specified in addition to the negotiation issue values defined in the negotiation exchange offer.

472 The first negotiation offer can be specified in the initiate message.
 473
 474 5.3.3 Negotiation message
 475 The negotiation messages are following the related initiate message.
 476

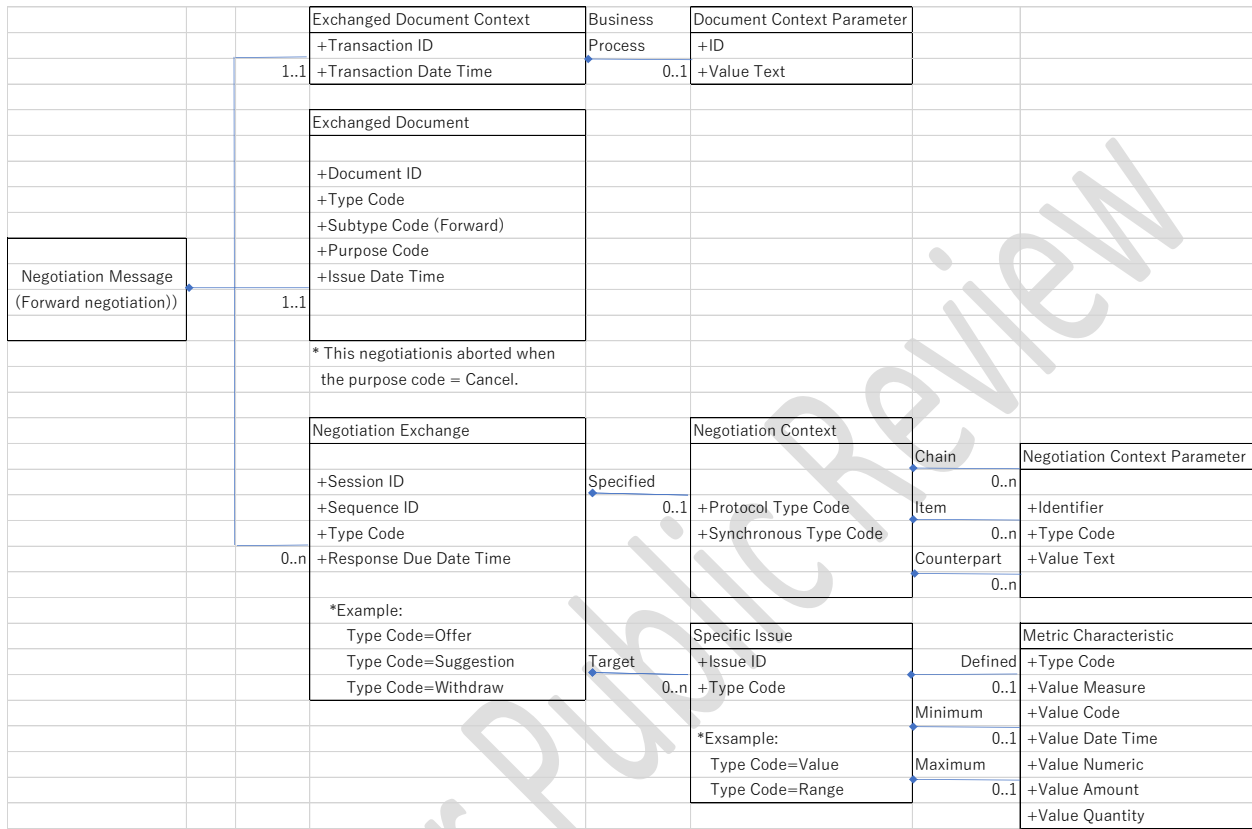


Figure 5.3-4 Negotiation message

A negotiator can abort the negotiation using the purpose code “Cancel” for the exchanged document.

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484 6. Annex

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486 6.1. Legal observation on eNegotiation and some contract law

487

488 **The eNegotiation Business Requirement Specification (BRS)**

489

490 The background and purpose of the UN/CEFACT project may be described as follows:

491

492 “Prior to the exchange of purchase order information during the BSP¹ “BUY” phase, human

493 staff in both companies negotiate the transaction conditions via email or telephone.

494 However, this is changing with advances in digital transformation and artificial intelligence;

495 Therefore, the semantics of the negotiation process and of the exchanged information

496 should be standardized. The negotiation process is entering a digital transformation (DX)

497 where both buyer and seller have developed electronic systems. From the buyer side, the

498 system often allows them to develop their own electronic bidding system and bid

499 comparison system. From the seller side, a sales system must connect to multiple

500 prospective buyer systems, each with different semantics. Standardized semantics would

501 allow the seller to not only reduce costs, but also to set up a decision-making system

502 defining which item(s) should be sold to which company(ies). In addition to this digital

503 transformation, artificial intelligence (AI) and robot process automation (RPA) can

504 ultimately assist in achieving better negotiating conditions. Current human-based

505 negotiations require a human decision at each proposal; therefore, message exchange can

506 increase exponentially in order to reach the best solution among possible conditions of the

507 contract. With an AI negotiator, the exchange can be automated allowing to reach better

508 condition faster. The final approval may still require human approval, but this approach

509 achieves business efficiency and optimality. ISO/IEC 15944-1 defines five fundamental

510 activities (repeated in the UN/CEFACT UMM User Guide of 2003) of a business transaction:

511 planning, identification, negotiation, actualization and post-actualization. This work

512 corresponds to the negotiation phase.²

513 It is further stated that the project aims to define the business processes and data exchange

514 requirements related to electronic contract negotiations. This concentrates specifically on protocols and

515 data formats rather than internal decision processes. In this way, a human negotiator, an AI negotiator,

516 or a human negotiator assisted by an AI/robot support should use the same base semantic protocols.

517 Three use cases are addressed, 1) manufacturing, 2) in marine and 3) in air cargo. The focus is on the

518 contractual relationship between two parties. The existing BRS and related standards for eTendering and

519 CI-Scheduling are used as points of reference. The BRS for eNegotiation addresses the following:

520

521 • Contract at various levels - which aspect of the contractual relationship is addressed: frame or

522 basic contract, specific supply contract with quantities, specifications, prices etc. (on-

523 demand/capacity), individual delivery obligations agreeing on delivery dates and places,

524 potentially trade terms. These levels can also be approached in time terms: annual, monthly and

525 daily contracts.

526 • Supply Chain – the relationship between buyer and seller for each domain

¹The Buy-Ship-Pay reference models developed by the UN/CEFACT describe the main processes and parties in the international supply chain and the high-level data entities of the involved international sales and transport contracts, see <http://tfig.unece.org/contents/buy-ship-pay-model.htm>.

² See further <https://uncefact.unece.org/display/uncefactpublic/eNegotiation>

525 • Negotiation – The negotiation mechanism contains a variety of rules; nested negotiation,
526 competitive negotiation, asynchronous/synchronous negotiation and so on.

527

528 **eNegotiation from a legal perspective**

529

530 International instruments to be observed

531

532 The status and effects of eNegotiation are governed by the law or laws applicable to the contractual
533 relationship between the parties. Usually, the effects are on the parties only, but may exceptionally
534 extend to third parties. This note is general and builds on the legal instruments created by UN agencies
535 with some general comparative issues.

536 UN/CEFACT bases its work on legal instruments established in the UN framework. This involves especially
537 the United Nations Convention on Contracts for the International Sale of Goods (CISG). Part II of the CISG
538 addresses formation of contracts. It should be observed that the CISG applies to the sale of goods, the
539 goods defined by the Convention. It does not therefore apply to the sale of services, including transport
540 services. Formation of such contracts is to be determined by the law applicable to such contracts or,
541 exceptionally, by contractual provisions.³

542 CISG was adopted in 1980 before the emergence of electronic contracting. In 2005, the United Nations
543 General Assembly in New York adopted the United Nations Convention on the Use of Electronic
544 Communications in International Contracts. The scope of this Convention is not restricted to the sale of
545 goods only and could be applied to services, too. Unfortunately, the Convention is not yet widely adhered
546 to.⁴

547 Both the CISG and the 2005 Convention on Electronic Communications in International Contracts build on
548 the reception rule as did the European communities standard Interchange Agreement of 1994. It could
549 therefore be stated that the reception rule constitutes an international legal rule or norm or uniform
550 practice which UN/CEFACT could base its standards on in the eNegotiation process.

551

552 From frame contracts to individual deliveries

553

554 There are often more than two parties at a negotiation stage, especially at a bidding stage, when no
555 contractual relationship yet exists.

556 In more permanent relationships, especially in manufacturing, **a frame or main contract** sets the stage for
557 the relationship between the parties. Most contract terms are thereby agreed in advance. Individual
558 orders for specific quantities of goods establish in a way individual contracts between the parties. Many
559 general contract terms stem from the framework contract but many specific terms such as the
560 specifications, quantities and prices as well as delivery terms are agreed by the parties on a case by case

³ An example of such a provision may be found in § 5 para 2 of the NSAB 2015 General Conditions of the Nordic Freight Forwarders, which states as follows:

“A contract between the freight forwarder and the customer (for carriage or other services) evidenced by electronic transport documents shall be deemed to have been concluded only when the freight forwarder issues an electronic receipt which includes an acceptance thereof.”

⁴ The Convention has, in January 2021, entered into force in 15 countries, including the Russian Federation.

561 basis based on demand and capacity. Individual. The parties may further agree on individual deliveries by
562 defining places and dates of delivery.

563 There are more complex contractual relationships with several parties, for instance the supplier has
564 subcontractors, which the supplier may use, usually according to the main contract. Unless the
565 subcontracts concern components to be included in the end-product by the supplier, deliveries often take
566 place between the subcontractor and the buyer directly.

567

568 Public procurement

569

570 In public procurement, framework agreements create systems in which bidding is made between
571 pre-determined parties according to pre-established rules. This is addressed in UNCITRAL Model Law for
572 Public Procurement 2011. A Dynamic Purchasing System (DPS) is unlike a traditional framework for the
573 supply of goods, works or services. A DPS is an electronic system which suppliers can join at any time. As
574 an 'open market' solution, a DPS is designed to give buyers access to a pool of pre-qualified suppliers.

575 The public procurement procedures precede the conclusion of a private law contract between the
576 contracting entity and the winning bidder, but at least the principal terms of the contract are already
577 established during the bidding procedures.

578

579 Formation of contracts

580

581 Formation of contract means its constitution through legal acts. The issue when a contract is formed
582 depends on the applicable law of the contract. In case the formation of contract is disputed, the issue will
583 be governed by the would-be applicable law (under English law the 'putative proper law'). Only very rarely
584 do standard contract forms regulate contract formation issues, but the validity of such clauses would be
585 governed by such would-be law.⁵

586 In general, a contract is concluded when there is a positive answer to an offer. National laws differ as to
587 when a positive answer is given. In many laws, the **reception theory** or rule is adopted. Legal effects take
588 place when the relevant communication is received by the addressee. In the electronic world, this takes
589 place when the relevant communication reaches the information system of the addressee. According to
590 the **dispatch theory** (or mailbox rule), the legal effects take place when the communication is dispatched.
591 In the world of electronic communication, there is not much difference, but in the traditional mail world,
592 it suffices to drop the letter to a mailbox to create binding effects. The reception theory is generally
593 applied by the so called Continental law countries whereas the dispatch theory is followed by English law
594 and those jurisdictions, which follow English law. The Nordic contract laws (Denmark, Finland, Norway
595 and Sweden) follow the so called **information theory** whereby it is not enough that a communication
596 reaches the addressee. The addressee must also be informed of it. Such an approach involves cognitive
597 elements which are not easily applied to an AI environment. Moreover, they entail problems of proof.

598 The above rules deal with contractual communications which are constitutive. This means that a new
599 contractual relationship is established or the terms of an existing relationship are amended by new ones.
600 They apply to both offers and acceptance.

601

602 The construction of the contract

603

⁵ An example is found in Clause 2 of the ECE188 General Conditions for the Supply of Plant and Machinery for Export 1953.

604 Formation of contracts through an offer and acceptance is mechanical. Contracts may also be formed at
605 a negotiation table or, in a less mechanical manner, through the uniform conduct of the parties
606 establishing practices between themselves. This should be borne in mind when developing artificial
607 intelligence (AI) solutions for contract formation. On top of formation of contracts one should also have
608 an eye for the construction of contracts. There may be contractual clauses such as 'Entire Agreement
609 Clause' stating that only the text of the written agreement negotiated and signed by the parties counts as
610 contract terms. The validity of such clauses and the construction of the terms of the contract depend on
611 the applicable law.

612

613 Non-constitutive contractual communications

614

615 The parties exchange communications during the operation of contracts, usually relating to their
616 performance. These may be anticipated, for instance when a seller informs the buyer about the
617 prospective delivery date in accordance with the agreed delivery terms. Such communications may also
618 be in a way unanticipated, for instance when the buyer sends a notice on the non-conformity of the goods.
619 Legislation also addresses non-constitutive contractual communications,⁶ but usually the parties address
620 the requirements such as the form of these communication in their contract.

621

622 Communication risks

623

624 It is generally understood that the communication rules also address the risks involved in contractual
625 communications. As the main rule is that a message need to reach the addressee, it is common to request
626 or issue an acknowledgement of receipt.⁷ It is somewhat uncertain, to what extent do the Incoterms®
627 2020 address communication risks. This has probably never been expressly contemplated, but the
628 wording of the black-letter text may lead to another conclusion.⁸

629

630 Battle of forms

631

632 The above remarks relate to a situation where the parties are in agreement on the basic terms of the
633 contract. This is the case when a frame agreement already exists between the parties or, more suitably,
634 when the parties agree to use a standard form contract, usually called a model contract such as ECE, ICC
635 or Orgalime model contract adapted to their relationship.

636 Should the parties be negotiating their relationship from the outset, they may disagree what the terms of
637 the contract are. In legal literature and practice, a **battle of forms** may arise. Party A makes an offer
638 referring to a set of conditions A and party B accepts the offer referring to the set of conditions B, which
639 derogate to a certain degree from Conditions A. There are legal rules and approaches as to how to solve
640 the problem. The **first shot** rule gives priority to the first contractual communication whereas the **last shot**
641 rule prioritizes the last communication. Some legal rules allow contracts to be formed despite
642 divergences in contractual communications.⁹ Unfortunately, these approaches are very divergent.

⁶ See Article 27 of the CISG, which largely applies the dispatch theory to such communications.

⁷ This is found in standard Interchange Agreements.

⁸ In many of its articles the rules provide "the (seller/buyer) must assist the (buyer/seller) by...at the risk and expense of the (latter)...".

⁹ See Uniform Commercial Code § 2-207 and the Unidroit Principles of International Commercial Contracts, Art. 2.1.22.

643 Therefore, a project defining the business processes and related data exchange requirements related to
644 electronic contract negotiations cannot be built on any of these theories, but must assume that some
645 legal terms are already in place (e.g. by virtue of a frame agreement).

646
647 The treatment of automated computer systems in law

648
649 Article 13(2)(b) of the UNCITRAL Model Law on Electronic Commerce 1996 already addressed automated
650 computer systems and this was reiterated in Article 14 of the 2005 Convention on Electronic
651 Communications in International Contracts. The actions of automated systems programmed or used by
652 people will bind the user of the system regardless of whether human review of a particular transaction
653 has occurred. The question of mistakes and errors in contract formation is governed by the applicable
654 national law.¹⁰

655
656 23 August 2021

657
658 Lauri Railas

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¹⁰ See further Lauri Railas, *The Rise of the Lex Electronica and the International Sale of Goods*, Forum Iuris, Helsinki 2004, available electronically at <http://urn.fi/URN:ISBN:978-951-51-3693-0>.