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International Supply Chain Programme Development Area

Supply Chain Management and Procurement Domain

e-Negotiation

Implementation Guideline

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**\*Change Log**

| **Date of Change** | **Version** | **Paragraph Changed** | **Summary of Changes** |
| --- | --- | --- | --- |
| 30 Sep 2021 | 0.3 |  | The 1st draft of Implementation Guideline |
| 10 Dec 2021 | 0.5 |  | Apply the comments from the team members |

# Preamble

eNegotiation is a generic Business Requirements Specification (BRS) that can be applied to various business domains. However, in eNegotiation it’s difficult to understand its specific application method and the business value in each business domain such as logistics and manufacturing. In addition, as the purpose of UN/CEFACT, which standardizes the semantics of messages exchanged in business, it is an issue that various interpretations can be made possible when eNegotiation is applied to each domain. If various interpretations become possible, there is a risk of contractual problems among business partners. In order to prevent contractual problems, use cases including semantics of each domain are described in this guideline.

# References

　・eNegotiation BRS

　・Buy-Ship-Pay RS

　・Multi Modal Transport BRS

　・UN/CEFACT BRS Booking v1

　・UN/CEFACT BRS Cross Industry Scheduling

　・UN/CEFACT BRS Cross Industry Quotation

# Objective

The first purpose of this Implementation Guideline is to present a method of adjustment and negotiation corresponding to the respective domain to which it applies. In addition, by presenting it, there will not be any difference in meaningful interpretation of adjustments and negotiations made between the two business partners.

Secondly, it will be a reference for the design when eNegotiation will be applied in other new domains. By presenting specific examples, it is possible to facilitate design and standardization in new domains.

Thirdly, it is to describe the use cases for each domain from the viewpoint of adjustment and negotiation. This clarifies the lack of specifications in each domain. In addition, these use cases are input for each domain to consider the specifications.

# Scope

After the commercial terms are agreed between the business partners, the exchange of standardized commercial orders such as the existing related UN/CEFACT specifications are in scope. Therefore, they are NOT in the scope of this Implementation Guideline. This Implementation Guideline only standardizes on the process of coordinating and negotiating the terms and conditions of trade between business partners that takes place before that. In principle, this Implementation Guideline uses a UN/CEFACT existing specification for each domain. However, the information model for agreeing on commercial terms, which is required to describe the use case scenarios and which is not specified by existing standards, can be provided additionally in this Implementation Guideline for some domain. These information models are only reference information for each domain. At a later date, if these information models are specified in each domain, the information model specified in each domain will be prioritized.

# Business Requirements Elaboration

### Bid Process in Maritime Transportation

Table 5.1‑1 Terms

|  |  |
| --- | --- |
| Term | Definition |
| Bid | It is a process that involves the obligation to present a proposal to the negotiating partner and carry out its content on accecptance. |

### Overview

A Beneficial Cargo Owner (BCO) is an importer/exporter that takes control of a shipment to the destination instead of utilizing a third-party source like a freight forwarder.

A BCO chooses a maritime transportation company in one of the following ways:

1. Using the maritime transportation company booking system. This method is used mainly by those with some ad-hoc need (Spot).
2. Direct negotiation with the maritime transportation company. This method is used mainly for long-term agreement.
3. Bidding maritime transportation companies. A closed group offer to the ones the BCO sends the offer request to. This method is used mainly for long-term agreement.

We will be giving an example of long-term negotiation, a case where a BCO chooses one or more maritime transportation company once a year, comparing offers by using an electronic bidding system.

Even with electronic bidding systems, it takes a few months for a BCO to select a maritime transportation company because of several reasons:

1. The large number of parameters to compare and it may be necessary for these to be compared by a person.
2. Each BCO requires different parameters using a different electronic bidding system.
3. Almost all the maritime transportation company’s departments are involved in the bidding process (Commercial for pricing, Customer service and Operations for Service Level Agreement (SLA) requirements, Financial for payment terms and invoicing requests. IT system for Electronic Data Interchange (EDI) and reports requests, local representative when the BCO is international).
4. There are usually 2 rounds of offers and there is also one face to face negotiation.

Because of that BCOs are forced to negotiate once a year, January or April according to the relevant financial year. Since there are various environmental changes such as changes in demand and market conditions, BCOs may want to make selections more frequently. In order to make selections frequently, it is necessary to streamline negotiations using Robotic Process Automation (RPA) /Artificial Intelligence (AI), etc.

There is no standardized mechanism for such negotiations in the maritime transport domain. For this reason, maritime transportation companies are forced to respond by changing the negotiation method individually for each BCO.

Figure 5.1‑1shows an overview of the scenario : BCO publishes a offer for annual maritime transportation service.

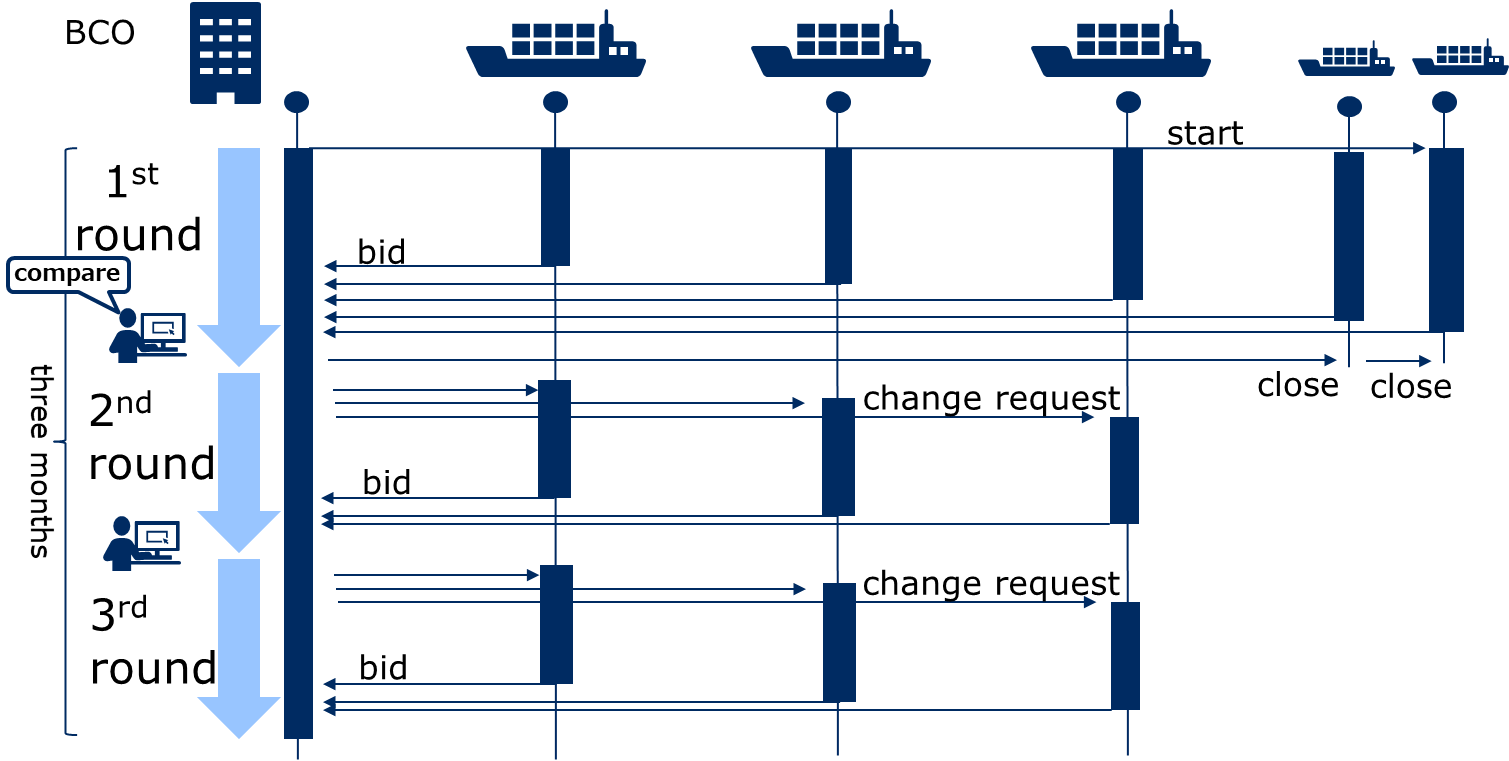


Figure 5.1‑1 Selection of Carriers in Maritime Transportation

### Bid process Scenario

Round 1

a. BCO sends the invitation to participate in an offer for annual maritime transportation service to maritime transportation companies. The expected dates for the next rounds may appear in the invitation.

b. Maritime transportation companies send their Negotiation Offer.

c. BCO evaluates these Negotiation Offers.

Round 2

a. BCO sends the invitation to update offers, he may also indicate which parameters are requested to be updated.

b. Maritime transportation companies send their updated Negotiation Offer.

Round 3

a. BCO evaluates these updated Negotiation Offers.

b. BCO sends the invitation to face to face negotiation.

c. Face to face negotiation.

### Negotiation Condition and Issue

As previously mentioned, there is a wide range of parameters in the offer.

These parameters are classified into two categories: Condition and Issue for example:  
Conditions:

1. Origin-Destination
2. Quantities (e.g. number of containers in twenty-foot equivalent unit (TEU), weight)
3. Kind of commodity (e.g. plastic products, marble stones)
4. Kind of package (e.g. 20 feet container. Open top container)
5. Frequency (e.g. twice a month, once a week)
6. Periodically (e.g. constant over the year, only in winter)
7. Incoterms (e.g. Free On Board(FOB), Free Carrier(FCA))
8. Logistic services needed (e.g. land transportation in destination)

Issues:

1. Peak season charges (e.g. included or not in the price)
2. Congestion charges (e.g. included or not in the price)
3. Demurrage fee (e.g. included or not in the price)
4. Storage fees (e.g. price per day, number of free storage days included)
5. Land transportation fees
6. BAF - Bunker Adjustment Factor (e.g. is this additional charge, reflecting the cost of fuel to be used for the voyage, included or not in the price)
7. Transit time
8. Inland dray transit time

## Freight Space Adjustment in Air Cargo

A sudden change (e.g. COVID19) in demand or supply induces a negotiation for deciding the price, delivery deadline, compensation etc. Complicated negotiation (e.g. nested) actually happens.

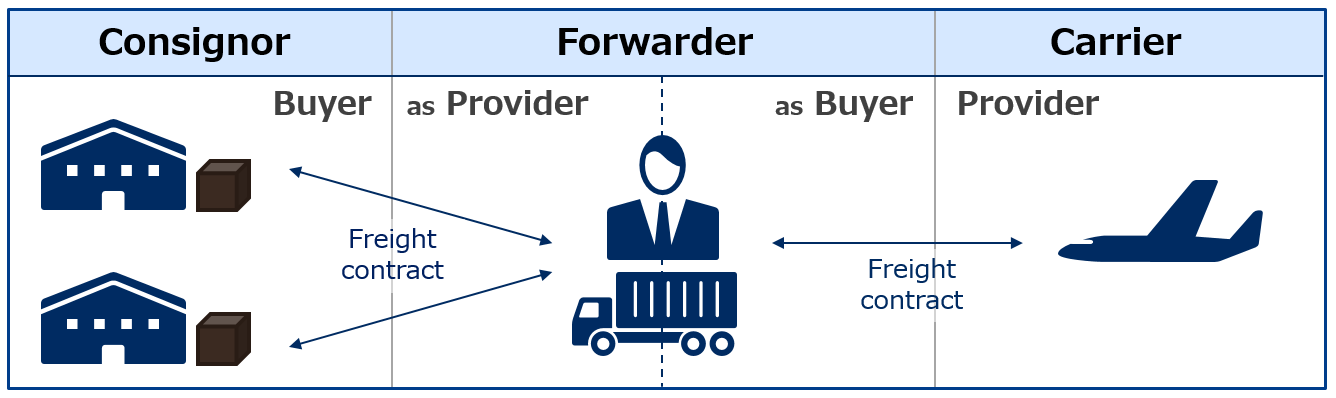


Figure 5.2‑1 Relationship between Actors

Table 5.2‑1 Terms

|  |  |
| --- | --- |
| Term | Definition |
| Transport Service Buyer  (Consignor or Forwarder) | The buyer of transport services as stipulated in a Transport Service Contract. |
| Transport Service Provider  (Carrier or Forwarder) | The provider i.e. seller of transport services as stipulated in a Transport Service Contract. |
| Spot | Ad-hoc request from Transport Service Buyer against a Transport Service Provider’s capacity. |
| Allotment contract | This contract enables the smooth operation of its business by securing a certain amount of transportation capacity in advance.  The contract period can be for a specific period of time such as a whole season or part of a season. |

This section describes the negotiation scenario in the Spot contract with the assumption that the Allotment contract has already been concluded.

### Negotiation Overview



Figure 5.2‑2 Negotiation Category and Flow

Table 5.2‑2 Negotiation Direction

|  |  |  |
| --- | --- | --- |
| **Negotiation Initiator** | **Negotiation Counterpart** | **Description** |
| Consignor | Forwarder | Red arrow in the Figure 5.2-2.  Negotiation will occur when the consignor asks for an increase or decrease in the cargoes. |
| Forwarder | Consignor | Blue arrows in the Figure 5.2-2  Forwarder will start nested negotiation after receiving offer of negotiation from Consignor or Carrier. |
| Carrier |
| Carrier | Forwarder | Green arrow in the Figure 5.2-2  Negotiation will occur when adjusting the cargoes reduction. (Either due to resolving the over sale or rescheduling flight.) |

**Note**

Forwarder who accepts negotiation from Consignor and Carrier, may refer and purchase Carrier's Spot slot to resolve the request. Spot slots and their prices are generally publicly available, so there will be no negotiation when purchasing spot slots.

The left side of the Figure 5.2‑2 is treated as Lower Tier, and the right side is treated as Higher Tier. Left-to-right negotiation is described as B (negotiation from **B**uyer-side) and right-to-left negotiation is described as P (negotiation from **P**rovider-side).

It also describes negotiation to add cargoes and slots as [+], negotiation to cancel as [-] and the presentation of alternatives as [–] and [+]. While negotiating at the same time the negotiation will be described as [- +].

In this section, when pointing to a certain negotiation, the above notation is combined and described as B+ and P-.

### Business Requirements

* + - 1. Negotiation Scenarios from Consignor to Forwarder

**B+**

Following scenarios occur when Consignor requests new cargoes to Forwarder:

Table 5.2‑3 B+ scenarios

|  |  |
| --- | --- |
| No. | Scenario |
| 1 | Forwarder allots the Consignor's new cargoes requests to allotment. |
| 2 | Forwarder reserves new Carrier’s Spot slot (Preferred day) |
| 3 | Forwarder reserves Carrier's Spot (Non Preferred day) |
| 4 | Forwarder adjusts with other Consignor's slots |

**B-**

Following scenarios occur when Consignor requests for cancelling the shipping of the shipment to Forwarder:

Table 5.2‑4 B- scenarios

|  |  |
| --- | --- |
| No. | Scenario |
| 1 | Forwarder adjusts in allotment-reserved slots |

* + - 1. Negotiation Scenarios from Carrier to Forwarder

**P-+**

Following scenarios occur when Carrier presents an alternative flight and demands a reduction in the slot:

Table 5.2‑5 P-+ scenarios

|  |  |
| --- | --- |
| No. | Scenario |
| 1 | Forwarder allots the consignor's new cargoes requests to allotment. |

**P-**

Following scenarios occur when Carrier requests a reduction in the slot without presenting an alternative flight:

Table 5.2‑6 P- scenarios

|  |  |
| --- | --- |
| No. | Scenario |
| 1 | Forwarder adjusts in allotment-reserved slots |
| 2 | Forwarder reserves new Carrier’s Spot (Preferred day) |
| 3 | Forwarder reserves Carrier's Spot (Non Preferred day) |
| 4 | Forwarder adjusts cargoes on alternate flights presented by Carrier |
| 5 | Forwarder adjusts with other Consignor’s slots |

### Information Flow Definition

* + - 1. Forwarder allots the consignor's new cargo requests to allotment.

This section describes No.1 Scenario of B+ as stated in section「5.2.2.1Negotiation Scenarios from Consignor to Forwarder」. Forwarder who receives a transport order request from a Consignor to move a shipment of goods which is adjusted within the scope of the allotment. At that time, Forwarder will neither be reserving a new Spot slot for Consignor nor be scheduling the contracted Spot slots with another Consignor as described in Figure 5.2-3.

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Figure 5.2‑3 Forwarder allots the consignor's new cargo requests to allotment

(Use Case Diagram)

Table 5.2‑7 Forwarder allots the consignor's new cargo requests to allotment

(Use Case Description)

|  |  |
| --- | --- |
| Identifier | Add a cargo |
| Description | Consignor asks Forwarder to add a cargo.  Consignor and Forwarder negotiate (e.g., by specifying price, quantity, and delivery date). If negotiation is agreed, Forwarder assigns a new cargo to an allotment slot contracted with Carrier. |
| Partner Types,  Roles | Consignor  Asks Forwarder to add a cargo and start negotiation  Forwarder  Assigns the requested cargo from consignor to the allotment slot |
| Constraints | Forwarder must have completed the allotment contract with Carrier in advance. |

Figure 5.2‑5 and Figure 5.2‑6 represents the activity diagrams which describe 2 phases "Negotiation Phase" and "Commitment Phase" as stated in Figure 5.2-4.



Figure 5.2‑4 Phase transition



Figure 5.2‑5 Forwarder allots the consignor's new cargo requests to allotment Activity Diagram (Negotiation Phase)

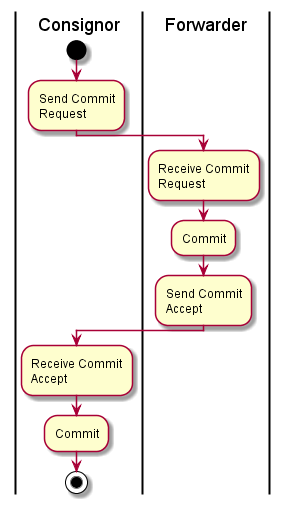


Figure 5.2‑6 Forwarder allots the consignor's new cargo requests to allotment Activity Diagram (Commitment Phase)

## IFT (International Forwarding and Transport) Booking

Bookings form an integral part of the ‘Buy-Ship-Pay’ model where the transportation of goods is not only using available capacity offered by a Transport Service Provider but also binds the supply chain together with a Transport Schedule. This provides multiple interested parties with the scheduled movements of a consignment from which the delivery of service can be executed and measured. For the details about Booking requirements and terms, refer to the Booking BRS. Multiple IFT Booking blocks are combined with the eNegotiation BRS block. In this way, our framework does not conflict with the existing IFT Booking framework but can be included by mapping features.

Figure 5.3-1 represents the activity diagram which describes the BRS 'IFT Booking (section 5.4.1 Business Transaction View – Transactions and Authorized Roles)'.

The red coloured frames and stereotypes in the diagram describe the functions of Alternating Offers Protocol (AOP).

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



Figure 5.3‑1 IFT Booking Activity Diagram

## Scheduling in Manufacturing

### Overview

Cross Industry Scheduling defines a negotiation-like message exchange, which is about demand forecast and supply instruction.

In the BRS of eNegotiation, it was described using a domain-independent information model such as Offer.　In this document, in order to be consistent with the message exchange for negotiation stipulated in the existing BRS of eNegotiation, it is business dependent. As a result, it can be regarded as adaptive eNegotiation using an existing message exchange implementation.

In a demand forecast process, the expected quantity will be exchanged. Regarding this information exchange there are thoughts that it is a reference value and also the thought that some obligation is accompanied. Based on the latter thought, the obligation with regard to quantity is defined here. The reason is the lack of obligation which induces supplier’s excess stock or over capacity. In addition, by clearly defining this, quantitative automatic evaluation using AI etc. is also possible.

### Scenario

Figure 5.4-1 describes the example for the demand forecast and supply instruction processes between a buyer (e.g. car manufacturer) and a supplier (e.g. car parts manufacturer such as handle, wheel, and engine). These processes correspond to “5.1.4.2 Demand and Capacity Adjustment” (L2) and “5.1.4.3. Individual Order” (L3) described in the eNegotiation BRS respectively.   
  
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Figure 5.4‑1 Demand Forecast and Supply Instruction

In a demand forecast process, the buyer predicts the sales volume of the product and based on it, the buyer suggests the required number of parts to the supplier. The supplier evaluates the suggestion and replies whether the sales volume is acceptable. If it is not acceptable, supplier replies with the supply volume, taking into account its own production capacity and desired sales quantity. However, since the value determined here is just a reference value, the actual supply amount may fluctuate depending on the demand.

The supplier makes a production schedule based on this reference value, however, in general, actual sales volume often deviates from the forecast because it is difficult to predict the demand volume perfectly. So the quantity instructed from the buyer may deviate from this reference value. Therefore, excess stock (due to lack of demand on the buyer side) and over capacity (due to excess demand on the buyer side) may occur on the supplier side.

In order to introduce eNegotiation for these processes, it is necessary to clearly define the obligations of buyer and supplier in the negotiation message exchange.

・ Supplier’s obligation to supply (buyer’s right to buy)

・ Buyer’s obligation to buy (supplier’s right to supply)

This will allow the suppliers to control the range of supply obligations in the L2 negotiation phase because they can take into account their own production capacity in this phase. This prevents the occurrence of excess stock and overcapacity in advance.

Moreover, in the L3 negotiation phase, this will allow the possibility to further negotiate the excess or shortage of demand in case of deviation from the predicted value when the supply obligation of the supplier is exceeded, or when the purchase order of the buyer is less than the obligation, etc. (Refer section 「5.2 Freight Space Adjustment in Air Cargo」 for more information about L3 negotiation use cases.)

### Existing commercial specifications and additional specifications

　・UN/CEFACT BRS Cross Industry Scheduling

　・UN/CEFACT BRS Cross Industry Quotation