



The European B2B Forum for the Electronics Industry

Business and Information Model Guideline Forecast & Inventory Management

Issue 2

Endorsed 5 August 2003

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EDIFICE

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Publication Summary

Title:	Forecast and Inventory Management Business and Information Model Guideline
Author (s):	EDIFICE Forecast and Inventory Management task group
Issue number:	Issue 2
Date of Issue:	5 August 2003
Number of Pages:	37
Readership:	All
Language:	English
Abstract:	This document defines and describes various business scenarios in which forecast, order and inventory information may be exchanged between Buyer (customer) and Seller (supplier), for various business purposes including forecasting, planning, delivery scheduling and inventory management between the involved parties.
Comment:	Comments and change requests to this document should be submitted to the EDIFICE secretariat



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Comparison to previous issue

No existing previous issue.

1 Foreword

This guideline has been developed by EDIFICE members and covers most present practices within the industry. This is NOT a complete overview covering the present & future developments, but is considered practical enough to help in understanding and standardizing.

2 Purpose

The models below describe various business scenarios in which forecast, order and inventory information may be exchanged between buyer (customer) and seller (supplier), for various business purposes including forecasting, planning, delivery scheduling and inventory management between the involved parties.

The goal is to provide a reference document which allows for consistent implementation of such processes within the electronics industry. The prime focus is on the EDI aspects, other issues which may arise, such as financial and legal aspects, are not specifically covered.

The specification of business processes and information flows forms part of the EDIFICE EDI Implementation guideline, and describes contexts in which the EDIFICE Delivery Forecast, Delivery Just In Time and Inventory Report EDI messages are intended to be used. These activities do not operate independently of other processes: conventional ordering, invoicing/self-billing, physical distribution and payment processes may also be involved.

3 Overview

The bounds of this concerns a "manufacturing" entity, meaning a complex process demanding raw materials and delivering product in the hands of the end user.

In control terminology, it is a network with a topology consisting of a multiplicity of nodes and links.

Today, in business terms, we recognise a node as being characterised by a materials planning process (e.g. MRP), and an elemental link as being a data connection between two nodes in the network.

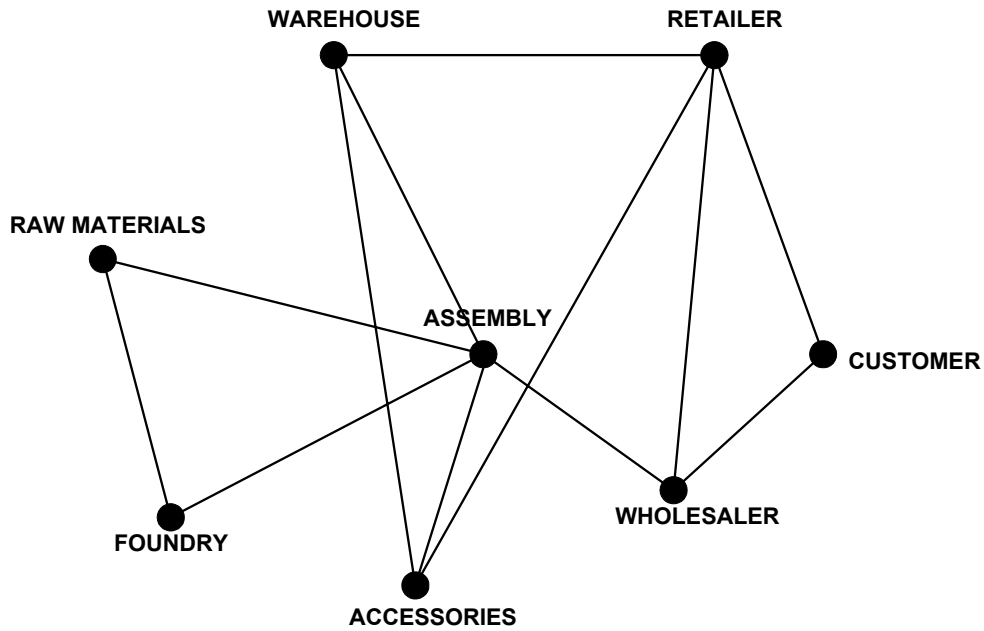


FIG.1: EXAMPLE OF A GENERIC SUPPLY NETWORK OF NODES AND LINKS

In the example above, each of the nodes is itself part of other supply networks. These link to nodes in other networks which are not shown here.

If we can identify a sufficient description of a generalised link and its interaction with the node at each end, then by combining these, we can accurately build up and identify an entire network.

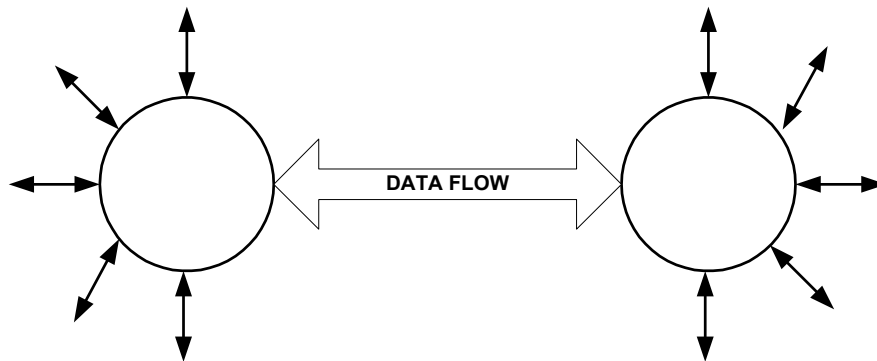
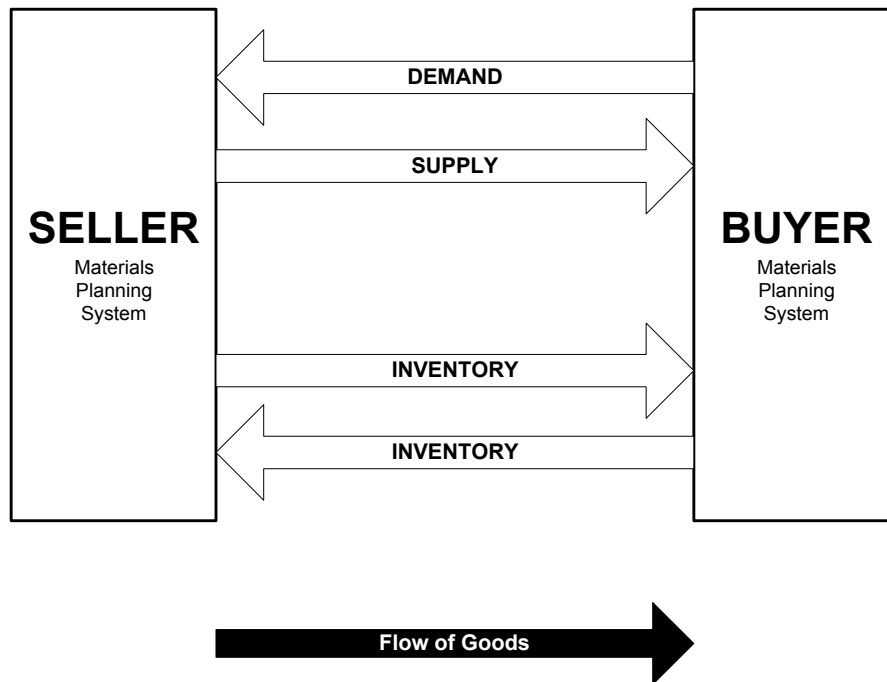


FIG.2: SINGLE BI-DIRECTIONAL DATA LINK BETWEEN TWO NODES

This is the so-called single factory concept. Today's business systems can in fact perform this inherently, within a single enterprise, since they have access to all the data relevant to that enterprise. What they do not have today is unrestricted access to the data from external enterprises.

If it is possible to identify the necessary information flow needed across an elemental link between two different proprietary MRP processes, then the integration of a cooperating two-enterprise supply link can be achieved, and by extension, potentially the relevant supply network.

Using this premise, the requirement for MRP-to-MRP bi-directional information flow can be standardised and is identified. This is nothing more than the supply & demand situation and inventory status/movement, by product.



4 DEFINITIONS

DEMAND: Information concerning forecasted or firm requirements over a future time period

SUPPLY: Information concerning the supplier's anticipated capacity

INVENTORY: Information concerning the movement of products and the quantity held in stock

FIG.3: INFORMATION FLOW ACROSS A LINK OF THE MATERIALS SUPPLY CHAIN

The next stage is defining how to implement the elemental 2 linked-nodes model in reality. Again, any node may be connected, using multiple links, to other nodes. This means that for practical, commercial, and security reasons, we have been forced to restrict our partners to use data in the nodes which has been limited and filtered for that specific link. The filter on the buyers side is a procurement system, which selects the data relating only to seller at the other end of the link.

The filter on the sellers side is a planning system, which selects the data relating only to the buyer at the other end of the link.

Typically these filters are very conservative, and block access for the other partner to additional information in that node, used for the MRP computations, and which would allow optimization of the overall process. It is for this reason that until quite recently, buying procurement was limited to issuing short term purchase orders and seller planning only to providing a best case match to these.

Business liability was 100%; any changes to demand/supply by either party required case-by-case negotiation.

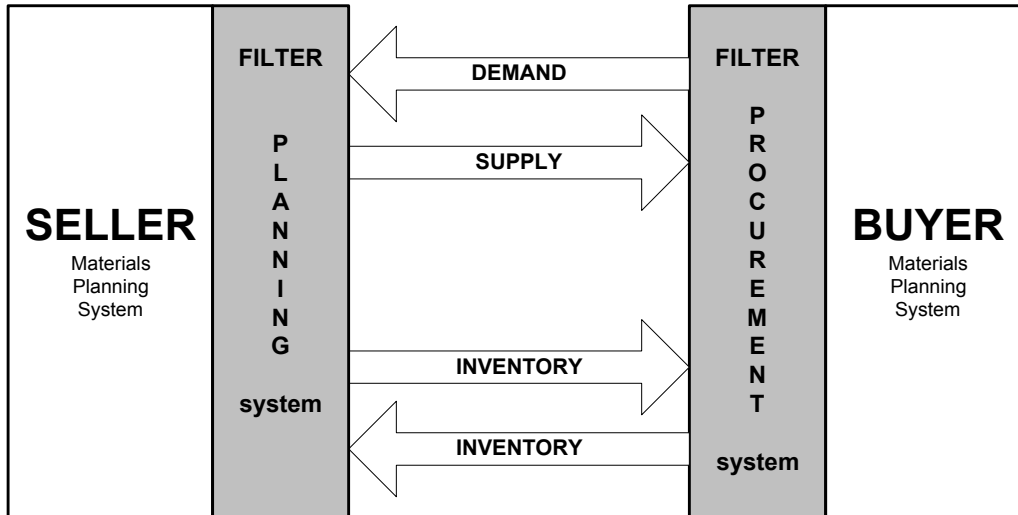


FIG.4: PRACTICAL 2-NODE SUPPLY CHAIN LINK

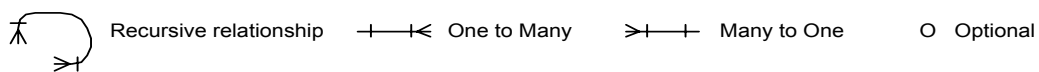
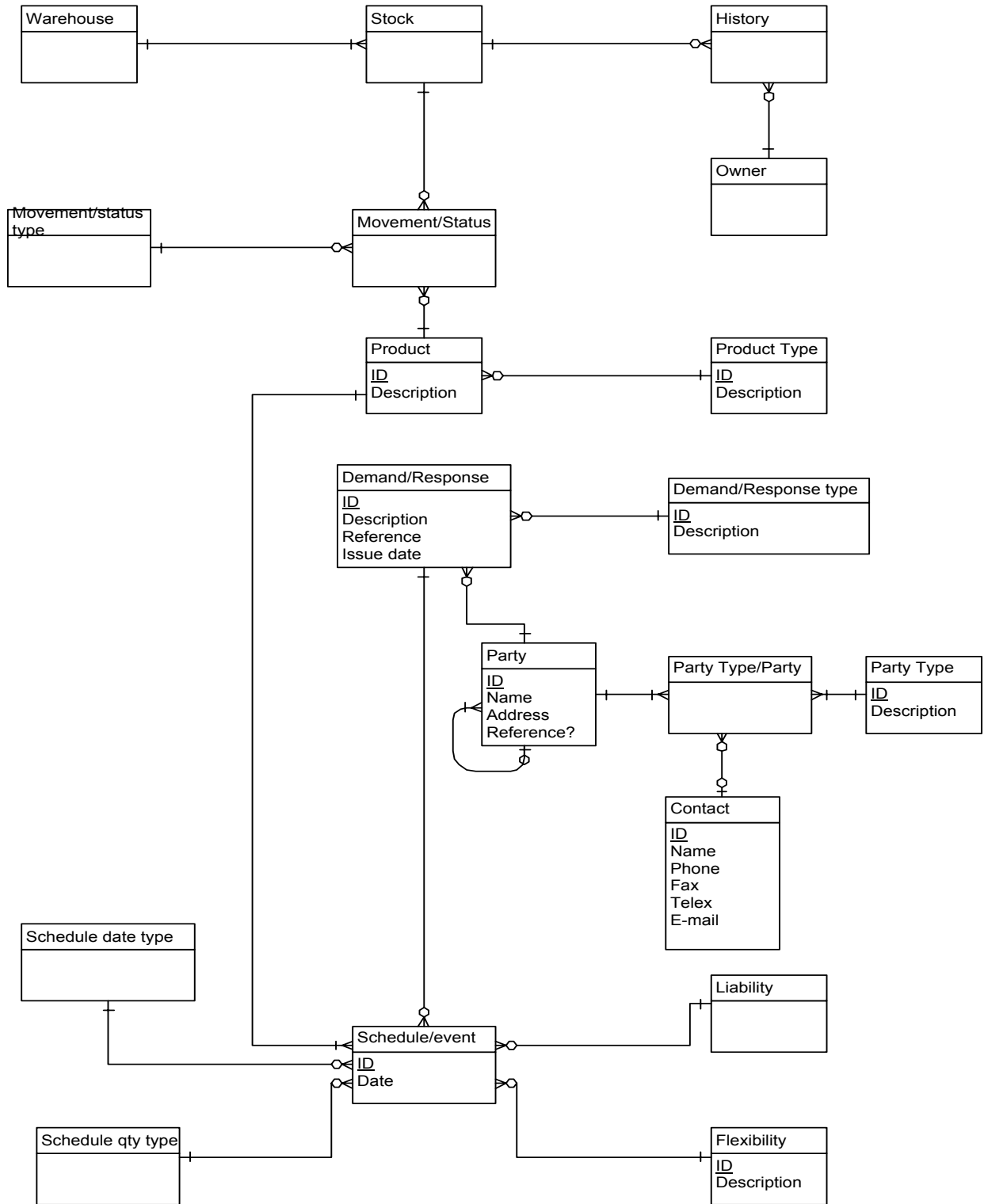
What has now been realised is that by making much more information available to the external partner, very impressive cost benefits can be realised, as the MRP systems become closer linked and optimisation of each elemental supply link is achieved. The movement of data between partners increases massively, which can only be implemented with a very reliable and resilient data link. Business liability is now shared between the partners.

Evidently these 2-node joint systems between partners should be standardised for maximum re-use and efficient implementation with all other partners. Until this is achieved, the individual links are implemented according to bilaterally agreed "service models". These are part of the dynamic process of gaining the confidence and building the capabilities of each partner, to move towards a solution of transparent linking and ultimately the "single factory".

Even then it is not finished, because we really need to optimize the relevant network and not each individual link which makes up the supply network. As outsourcing increases (in order to optimize other costs), there is no longer a unique "supply chain", but many different links which are controlled and related by data movements in adjacent links in the supply network. Examples are the use of contract manufacturing, remote warehousing, purchasing from distributors, etc. The beneficial effects of exchanging forecast and consumption data with related up-stream nodes is a well known academic exercise used in training materials managers.

This whole supply chain process should be a co-operative industry effort and can only happen if the overall objectives are understood by all parties, and adherence to agreed standards is appreciated and implemented. Customization is a temptation which has to be avoided as far as is possible.

5 Entity Relationship Diagram



6 Entity Relationships

Origin	Destination	Type	Comments	Definition
Demand_response	Demand_response_type	One (mandatory)	Each demand/response is always identified	Demand/ Response : corresponds to the DEMAND or the RESPONSE or the SUPPLY or the INVENTORY information
Demand_response_type	Demand_response	Zero to many	A type is identify up to several demands	Demand_response type : identifies the type of information
Demand_response	Party	One Mandatory	Party involved in a demand is always identified	Party : party involved in a process
Party	Demand_response	Zero to many	A party can be involved in the Demand_response	
Party	Party	Many to many	All the parties involved in the Demand_response determine the Demand_response	
Party	Party_Type/Party	One to many		
Party_Type/Party	Party	one		
Party_Type/Party	Contact	optional	For each party a contact can be identified	Contact : Communication entity belonging to a Party
Contact	Party_Type/Party	Zero to many	Contact can be linked up to many Party_Type/Party	
Party_Type/Party	Party_Type	one	Each party is identified	Party_Type : identifies the role of the Party e.g. Seller Buyer...
Demand_response	Schedule /event	Zero to many	Each demand (depending of its type describe many events (inventories shipments) or many schedules	Schedule/event : this entity will describe in a demand_response a sub process of schedule or inventory or shipment .
Schedule /event	Demand_response	One	A schedule/ event is always referred to in a Demand_Response	Remark : this doesn't means that in An other demand you do not give the same information,
Liability	Schedule /event	Zero to many		Liability : indicates in a schedule what commitment is specified (firm..frame)
Schedule /event	Liability	one	Each schedule has its liability	May be this part has to be reviewed This liability can be an attribute ?

Schedule_date_type	Schedule/event	Zero to many	Indicates the type of date linked with the schedule	Horizon date
Origin	Destination	Type	Comments	Definition
Schedule/event	Schedule_date_type	one		
Schedule_qty_type	Schedule/event	Zero to many	Indicates the type of quantity linked with the schedule	Gross /net ...
Schedule/event	Schedule_qty_type	one		
Flexibility	Schedule/event	optional	For each schedule a flexibility can be asked	Remark : definition of flexibility (can be reviewed later.)
Schedule/event	Flexibility	Zero to many	Each flexibility can be applied for many schedules.	
Schedule/event	Product	One	A schedule event is always linked to a product	
Product	Schedule/event	one to many	A product always refers to events/schedules	
Product	Product Type	one	Product id is always referenced	Eg : buyer code seller code ...
Product Type	Product	Zero to many	Indicate the origin of the product id	
Product	Movement/status	Zero to many	Indicate to which product the movement/status is related	
Movement/status	Product	one	Specify the concerned Product	
Movement/status	Movement/status type	one	Specify the movement status	Shipment, Inventory, picking ...
Movement/status type	Movement/status	Zero to many	Can be applied to several movement_status	
Movement/status	Stock	one	Belongs to one stock	Stock: logical store in which the inventory is specified
Stock	Movement/status	Zero to many	Describe the inventory	the set of movements and status are related to a stock visibility.
Stock	Warehouse	one	A stock belongs one physical emplacement	Warehouse: physical emplacement
Warehouse	Stock	One to many	A warehouse contains from one to many logical stores	
History	Stock	one	To be developed later	
Stock	History	Zero to many	To be developed later	
Owner	History	Zero to many	To be developed later	
History	Owner	One	To be developed later	

7 Data Requirements

Demand/Response

Product Information	<ul style="list-style-type: none"> - Packaging - Quality certificate number - Engineering change number - Revision number - Supplier number - Buyer number - 3rd party number - End customer number - Industry number - Universal product code - Product version number - Customs article number - Color number - Drawing number - Drawing revision number - General specific number - Model number - Standard group of products - Serial number
Quantities	<ul style="list-style-type: none"> - Gross/net - Liability - Variability - Capacity
Date/Time/Zone	<ul style="list-style-type: none"> - Discrete - Horizon (start/stop date)
Parties	<ul style="list-style-type: none"> - Buyer - Seller - 3rd Party - Ship-to - Sold-To - VAT-number - end customer - consignor - consignee
References	<ul style="list-style-type: none"> - Blanket PO number - Contract number - PO number - Previous delivery schedule no. - Item number - Price quote number - Government contract number - Call-off number - Consignment self-billed invoice number - Scheduling agreement number
Transport	<ul style="list-style-type: none"> - Express - Mail - Maritime transport - Rail transport - Road transport - Air transport - Multimodal transport
Scenario	<ul style="list-style-type: none"> - special function

Remarks:

Liability can be calculated from SCC figures – but as contractual agreements say to send liability figures it needs to be foreseen in the dataflow.

Inventory & Consumption

Product Information	<ul style="list-style-type: none"> - Packaging - Quality certificate number - Engineering change number - Revision number - Supplier number - Buyer number - 3rd party number - End customer number - Industry number - Universal product code - Product version number - Customs article number - Color number - Drawing number - Drawing revision number - General specific number - Model number - Standard group of products - Serial number
Quantities	<ul style="list-style-type: none"> - Charge (consumed quantity) - Quantity on hand - Received quantity - Return quantity - Quarantined quantity - Transferred out quantity - Transferred in quantity - Minimum quantity - Maximum quantity - flexibility
Date/Time/Zone	<ul style="list-style-type: none"> - cutoff date - target date - transaction date
Parties	<ul style="list-style-type: none"> - Buyer - Seller - 3rd Party - Ship-to - Sold-To - end customer - Freight Forwarder - VAT-number
References	<ul style="list-style-type: none"> - Proforma Invoice - Despatch advice number - Action authorization number - Invoice number - Packlist number - Shipment reference number - Transaction reference number - Contract number - Item number - Freight forwarder reference number
Currency	<ul style="list-style-type: none"> - Currency of the account - Invoice currency

Shipments

Product Information	<ul style="list-style-type: none"> - Packaging - Quality certificate number - Engineering change number - Revision number - Supplier number - Buyer number - 3rd party number - End customer number - Industry number - Universal product code - Product version number - Customs article number - Color number - Drawing number - Drawing revision number - General specific number - Model number - Standard group of products - Serial number
Quantities	<ul style="list-style-type: none"> - shipping quantity - quantity per pack
Date/Time/Zone	<ul style="list-style-type: none"> - despatch date - delivery date - arrival date estimated - departure date - pick up date - collection date
Parties	<ul style="list-style-type: none"> - Buyer - Seller - 3rd Party - Ship-to - Sold-To - end customer - Consignee - Consignor - Freight forwarder - Notify party - Ship from - Party to be billed - VAT-number
References	<ul style="list-style-type: none"> - Delivery schedule number - EUR 1 certificate number - Air way bill number - Bill of lading number - Road consignment note number - Contract number - Certificate of origin - House waybill number - Import licence number - Invoice number - Letter of credit number - Master air waybill number - PO number - Packing list number - Government reference number - Unique consignment reference number - Shipment reference number - Order number - Assembly country of Origin - Ship Country of Origin - Blanket PO number

	<ul style="list-style-type: none"> - Item number - Scheduling agreement number - License plate number - VAT registration number
Transport	<ul style="list-style-type: none"> - Delivery condition - Maritime transport - Rail transport - Road transport - Air transport - Mail - Express - Multimodal transport
Equipment details	<ul style="list-style-type: none"> - Box pallet - Container - Exchangeable EUR flat pallet - Trailer - Unit load device
Package/Measurements	<ul style="list-style-type: none"> - Packaging attributes like (barrel, bundle etc.) - volume - weight
Monetary Amount	<ul style="list-style-type: none"> - Line item amount
Scenario	<ul style="list-style-type: none"> - Distinction of Consignment

8 Scenarios

8.1 Foreword

This section describes scenarios which are representative of the commonly used business practices of the industry. This should not be considered as a complete list of all possibilities, nor should the fact that any particular scenario is described here be interpreted restrictively. Trading between business partners is a dynamic activity. Changes, as well as new scenario will doubtless occur as business practices evolve. Later editions of this document will certainly cover such cases.

8.2 Introduction

The scenarios presented here concern supply networks with TWO co-operating materials planning processes. Additional third parties may be present in the scenario, to provide contractual services to either or both partners, but these do not participate in the control logic of the inventories.

However, if third parties are introduced to provide additional inventories and to control them, then it will become necessary to analyse these multi-party networks into the constituent two party processes, and then merge them.

8.3 Demand

Forecasts are considered here as the buyer's expression of his future demand for a seller's products. The demand may cover any time, from immediate delivery to long-term planning.

Data will be represented using discrete time intervals, which the buyer specifies.

Forecasts may be used by the Seller for planning or allocating manufacturing capacity, acquiring raw material products, producing semi-finished inventories, and/or final assembling / testing to put into finished goods inventories.

Normally, the Buyer then issues firm Purchase Orders or Just-In-Time Separate release requirements, as instructions for the seller to ship goods.

8.4 Liability

Associated with each device/quantity/date which is forecasted is a "Scheduling Condition", used by the buyer to convey the financial liability which he guarantees to the seller for that data.

In return for this guarantee, the buyer may require that the seller accepts flexibility to make changes to the forecast within specified limits and time periods. Currently, these conditions are usually specified separately in the business contractual agreement..

8.5 Management of Inventory

In the two-party model, control of inventory may be assigned to either party.

1. Inventory control by Buyer.

In these conventional purchasing models, control is assumed by the Buyer, and will be identified here as Customer Managed Inventory (CMI). In CMI the customer defines (quantity and date) the moment of shipment based upon the requested date the goods need to be inhouse.

2. Inventory control by Seller.

If the inventory is controlled by the Seller, the model will be identified here as Supplier Managed Inventory (SMI). In SMI the supplier defines the moment of shipment (quantity

and date) using the boundaries for minimum and maximum stock as agreed with the buyer.

8.6 Ownership of Inventory

The legal ownership and financial implications of inventory are established independently of the physical location of inventory. Consequently it is possible for either party, or their contractors, to be holding inventory which does not legally belong to them. This implies additional audit and financial/tax controls.

8.7 How are the scenarios built up?

The scenarios are built around a 2-party model (buyer and seller) and a potential 3rd party who might handle the remote stock point (hub). In the latter case it is the buyer who has outsourced his operation of material handling of components to either the seller or either a 3rd party warehouse.

The FIM scenarios are built up upon 3 different questions:

- Is the inventory managed by the seller (SMI) or by the buyer (CMI)?
- Does the ownership of the inventory belongs to the seller (SMI) or the buyer ?
- Are the goods stored at the buyer's location or in a 3rd party warehouse?

This leads in total to 2x2x2 equals 8 scenarios.

For CMI scenarios the party who triggers the release is also identified. The latter is described because this might influence the way EDI needs to be set up between the partners. For SMI scenarios the release is always triggered by the replenishment calculation done by the supplier.

There is a lot of variance possible. Within the electronics industry the CEM (Contract Equipment Manufacturer) is a known other party (same applies for distributor). From EDI perspective the relation seller – CEM –buyer then needs to be split into 2 relations: seller – CEM and CEM- buyer. For those relations specifically the various described scenarios may apply.

8.8 Response to forecast

The EDIFICE Forecast and Inventory Management group is currently working on a Message Implementation Guideline for Response to Forecast. (DELFOR 'P')

9 Scenario Definitions

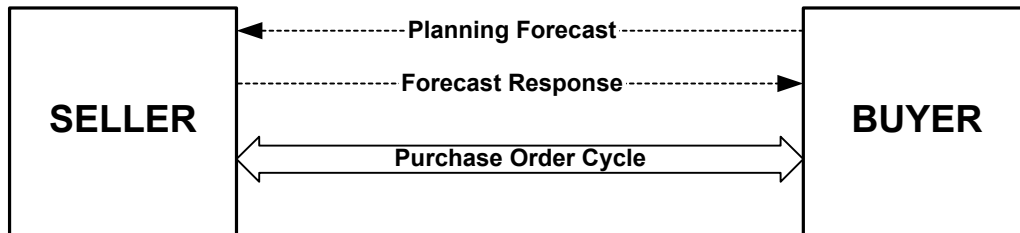
Model #	EDIFICE FIM Models	Consignment Y/N?	3 rd Party Warehouse Y/N?	Release mechanism	Scenarios
1				purchase orders embedded release separate release	1.1 1.2 1.3
2		no consignment		purchase orders embedded release separate release	See 1.1 See 1.2 See 1.3
CUSTOMER MANAGED INVENTORY					
3				purchase orders embedded release separate release	3.1 3.2 3.3
4				purchase orders embedded release separate release	4.1 4.2 4.3
SUPPLIER MANAGED INVENTORY					
5				- calculated (by seller)	5
6				- calculated (by seller)	6
7				- calculated (by seller)	7
8				- calculated (by seller)	8



9.1 Traditional Model of Customer Managed Inventory (CMI)

In the traditional model the buyer is determining how and when goods will be released by the seller. The most traditional way to do this is by means of a purchase order. Besides the purchase order optionally a forecast can be provided.

9.1.1. CMI with PO's



Replenishment is managed via the traditional Purchase Order cycle based on Seller's lead time. Forecasts may be optionally supplied from the Buyer to assist the Seller for planning purposes without liability.

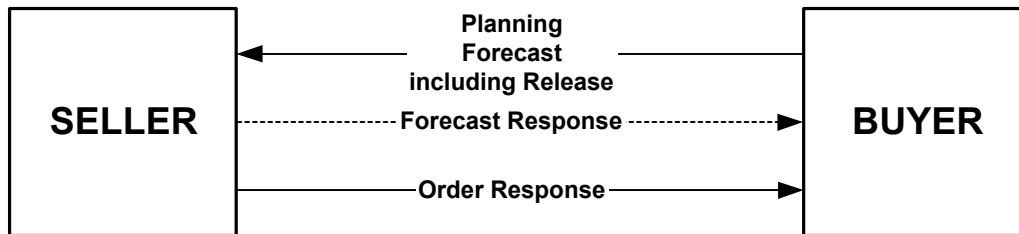
Firm Orders:	quantity, date, delivery location, order number
Order Changes:	quantity, date, order number
Order Responses:	quantity, date, order number
Forecast (optional):	quantity, time period, conditions

Recommended EDIFICE Messages:

Firm Orders:	ORDERS	
Order Changes:	ORDCHG	
Order Response:	ORDRSP	
Forecast (optional):	DELFOR	'A - 'B' -' C'

9.1.2. CMI using DELFOR with embedded release

In this model the DELFOR is used to provide a schedule of requirements and to trigger the moment of release. The release is triggered by the liability indication in the SCC segment.



The Buyer supplies a regular net planning forecast, against which the Seller manufactures goods ready for shipment.

In this scenario, typically, the forecast may be weekly, and the requirement includes the firm short-term deliveries which may be for one or more times in the week.

Forecast:	quantity, time period, conditions
Forecast Response:	quantity, time period
Embedded Order Responses:	quantity, date, order number

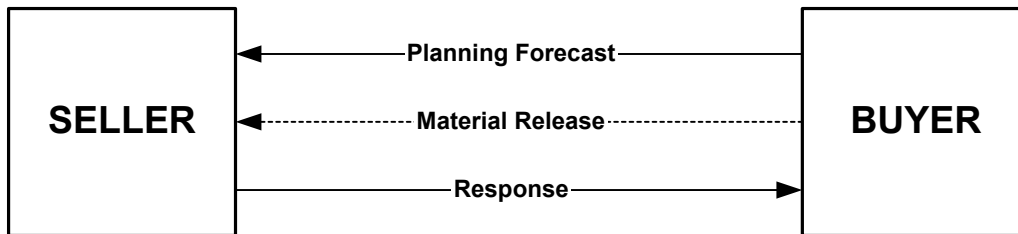
Recommended EDIFICE Messages:

Forecast with release:	DELFOR 'D'
Forecast Response (optional):	DELFOR 'P'
Order Response:	ORDRSP

EDIFICE recommends that the horizon of firm requirements embedded in the message is kept short, otherwise a more conventional ordering model should be used, like the model mentioned in scenario 1.1.

9.1.3. CMI using DELFOR with separate release

In this model the DELFOR is used to provide a schedule of requirements but the release is triggered with a separate message, typically the DELJIT.



The Buyer supplies a regular net planning forecast, based on which the Seller manufactures goods ready for shipment. Actual deliveries are based on a separate release by the Buyer.

This is a typical Just-In-Time scenario, recommended, for example, where the forecast is weekly but the releases are more frequent (i.e. several days per week or even several per day).

Normally a "separate release" calls for immediate despatch, so that an order confirmation as response may be superfluous: the Seller may however send an advice that the goods are being despatched, as the feedback to the separate release.

Forecast:	quantity, time period, conditions
Forecast Response:	quantity, time period
Separate release:	quantity, date, release number, delivery location
Separate release Response:	quantity, date, release number, delivery location, shipment number

Recommended EDIFICE Messages:

Forecast:	DELFOR 'C'
Forecast Response:	DELFOR 'P'
Separate Release:	DELJIT
Separate release response:	DESADV

9.2 CMI without consignment with the use of a 3rd party warehouse

Because this is CMI and no SMI there is no need to provide stock figures from the 3rd party warehouse to the supplier.

As a consequence of using a 3rd party warehouse follows the need for control of the in-transit between the 3rd party warehouse and the buyer. In this scenarios the control of the in-transit between the 3rd party warehouse and the hub is typically the responsibility of the buyer.

Basically the scenarios are the same as mentioned under 1. However the ship-to is different. Therefore all the variants refer to previous scenarios:

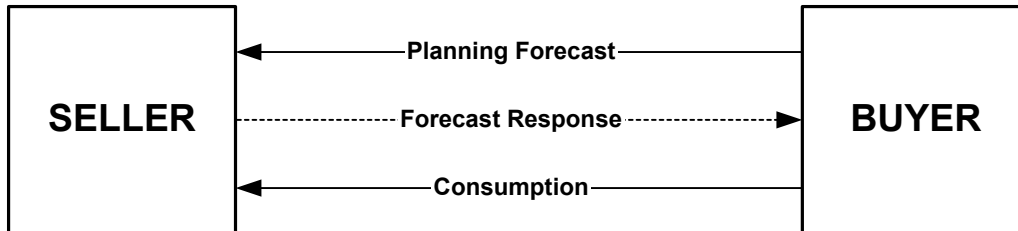
2.1 see 1.1

2.2 see 1.2

2.3 see 1.3

9.3 CMI with consignment without the use of a 3rd party warehouse

9.3.1. CMI with consignment stock and traditional order cycle



Replenishment is managed by the Buyer's forecasts with agreed liability. Consumption is reported in the INVRPT or the ORDERS message. Also the actual stock and receipts could be reported in this message for the parties to keep track of the inventory and to reconcile invoicing.

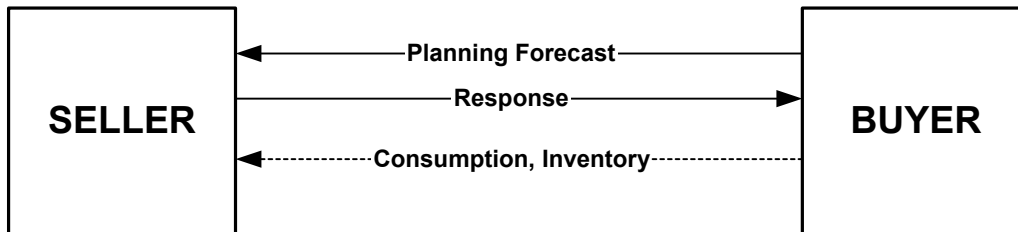
Forecast:	quantity, time period, conditions
Forecast Response:	quantity, time period
Consumption	quantity, date, order number

Recommended EDIFICE Messages:

Forecast:	DELFOR 'E'
Forecast Response (optional):	DELFOR 'P'
Consumption	INVRPT/ORDERS

9.3.2. CMI with consignment inventory using embedded release.

This scenario is not recommended.



The Buyer provides regular forecasts of net requirements, to ship into stock on the Buyer's premises. The Buyer manages the inventory levels / replenishment within parameters agreed with the Seller: the inventory is still the property of the Seller. Actual shipments may be made on the basis of firm order requirements embedded within the forecast message.

Consumption is reported by the Buyer as a basis for the Seller to keep track of the inventory and to reconcile invoicing.

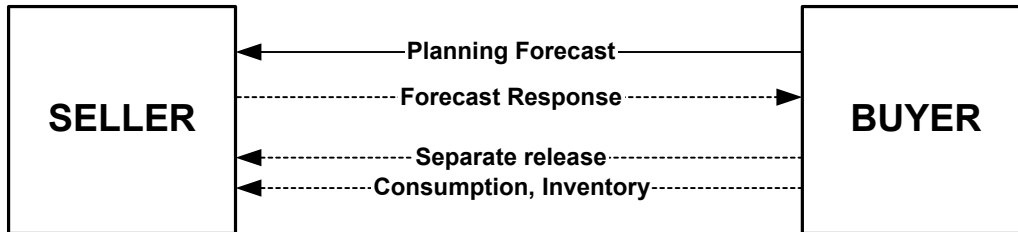
Forecast:	net quantity, time period, conditions
Forecast Response:	quantity, time period
Separate release response:	quantity, date, order number
Consumption:	quantity, date or period, reference number
Inventory:	quantity, date / time
Inventory movements:	last receipts (quantity, date, advice or delivery reference no.) last consumptions, adjustments

Recommended EDIFICE Messages:

Forecast:	DELFOR 'E'
Forecast Response:	DELFOR 'P'
Separate release response:	ORDRSP
Inventory:	DELFOR
Consumption:	DELFOR
Inventory Movements:	DELFOR

9.3.3. CMI with consignment stock and separate release

Planning Forecast with Separate Release, and Consignment
 This scenario is not recommended.



The Buyer provides regular forecasts of net requirements. The material delivery releases are determined separately, and probably on a more frequent basis, depending on actual production demands / consumption, on-hand inventory and any warehousing constraints. The Buyer manages the inventory levels / replenishment within parameters and liability agreed with the Seller : the inventory is still the property of the Seller.

Consumption is reported by the Buyer as the basis for invoice reconciliation and to keep track of the inventory.

Inventory data is provided as required, for stock reconciliation / audit purposes. This should include the last receipt details for reconciliation with goods in transit from the Seller.

Forecast:	net quantity, time period, conditions
Forecast Response:	quantity, time period
Separate release	quantity, date
Consumption:	quantity, date or period, reference number
Inventory:	quantity, date / time
Inventory movements:	last receipts (quantity, date, advice or delivery reference no.) last consumptions, adjustments

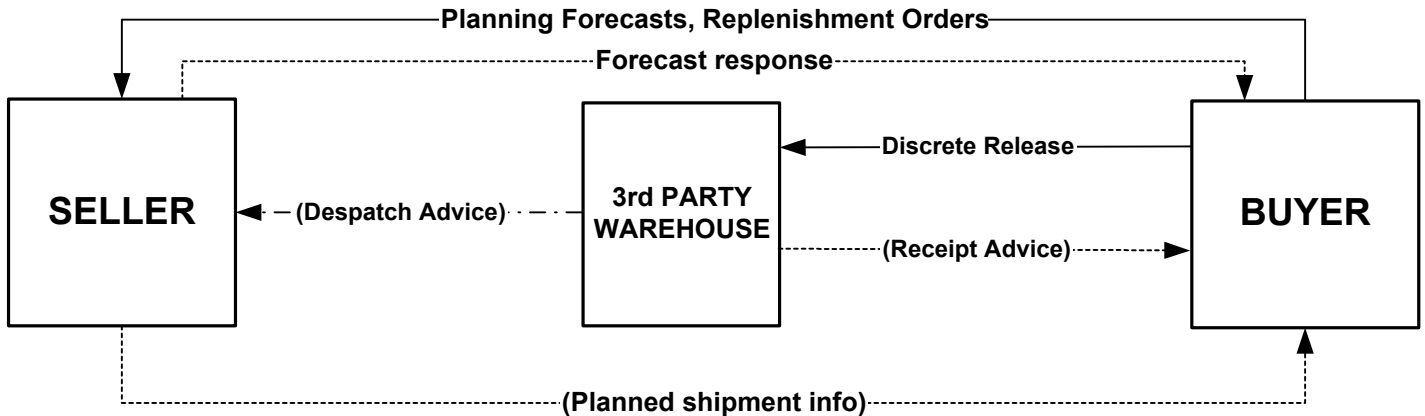
Recommended EDIFICE Messages:

Forecast:	DELFOR 'F'
Forecast Response:	DELFOR 'P'
Separate release:	DELJIT
Inventory:	DELFOR or INVRPT
Consumption:	DELFOR or INVRPT
Inventory Movements:	DELFOR or INVRPT

9.4 CMI with consignment with the use of a 3rd party warehouse

9.4.1. Consignment Inventory in 3rd Party Warehouse using traditional purchase orders

This scenario is not recommended



This is a variant of non-SMI Consignment Stock where the inventory is held in 3rd party premises.

The Buyer provides

- medium term gross forecast
 - short term (e.g. a few weeks) net demand (DELFOR)
- to which the Seller may respond.

Inventory is planned and managed by the Buyer, but paid for when goods are despatched from the warehouse.

The Seller needs

- a copy of the DESADV from the warehouse to track consumption and match with self billing invoices
- inventory reports for regular reconciliation (INVRPT).

The Buyer pulls deliveries from the warehouse (DELJIT or ORDERS).

A copy can be sent by the Buyer to the Seller as a control so that the Seller can monitor consumption and see that the replenishment purchase orders are correct.

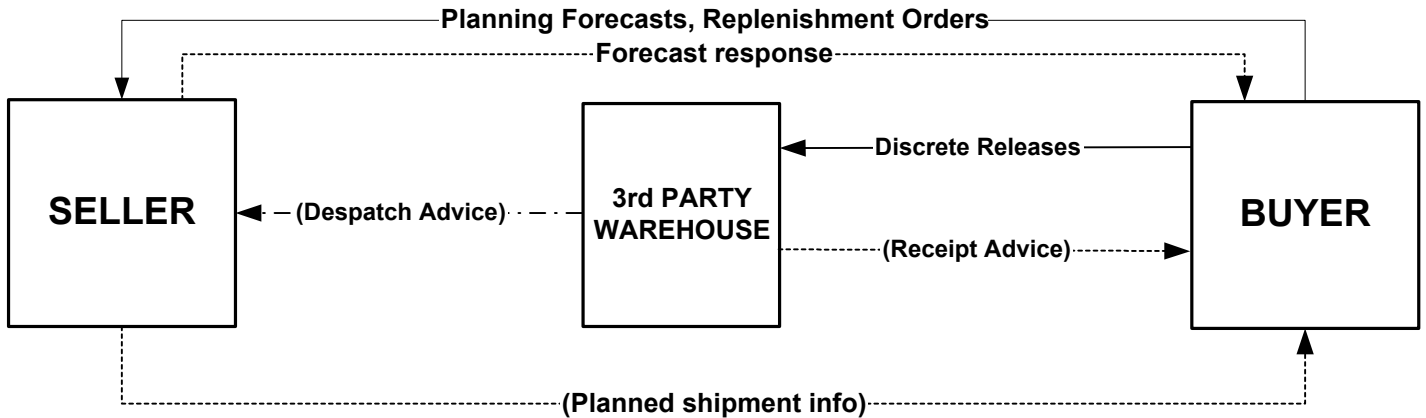
Consumption:	quantity, date or period, reference number
Inventory:	quantity, date / time
Inventory movements:	last receipts (quantity, date, advice or delivery reference no.) last consumptions, adjustments
Orders	net quantity, time period, conditions, PO reference
Forecast (optional):	net quantity, time period, conditions
Forecast Response (optional):	quantity, time period

Recommended EDIFICE Messages:

Inventory:	INVRPT
Consumption:	INVRPT, or DESADV (from warehouse)
Inventory Movements:	INVRPT
Orders	ORDERS / ORDCHG / ORDRSP
Forecast (optional):	DELFOR 'F'
Forecast Response (optional):	DELFOR 'P'

9.4.2. Consignment Inventory in 3rd Party Warehouse using embedded release

This scenario is not recommended.



The Buyer provides

- medium term gross forecast
- short term (e.g. a few weeks) net demand (DELFOR) to which the Seller may respond.

Inventory is planned and managed by the Buyer, but paid for when goods are despatched from the warehouse.

The Seller needs

- a copy of the DESADV from the warehouse to track consumption and match with self billing invoices
- inventory reports for regular reconciliation (INVRPT).

The Buyer pulls deliveries from the warehouse (DELJIT or ORDERS).

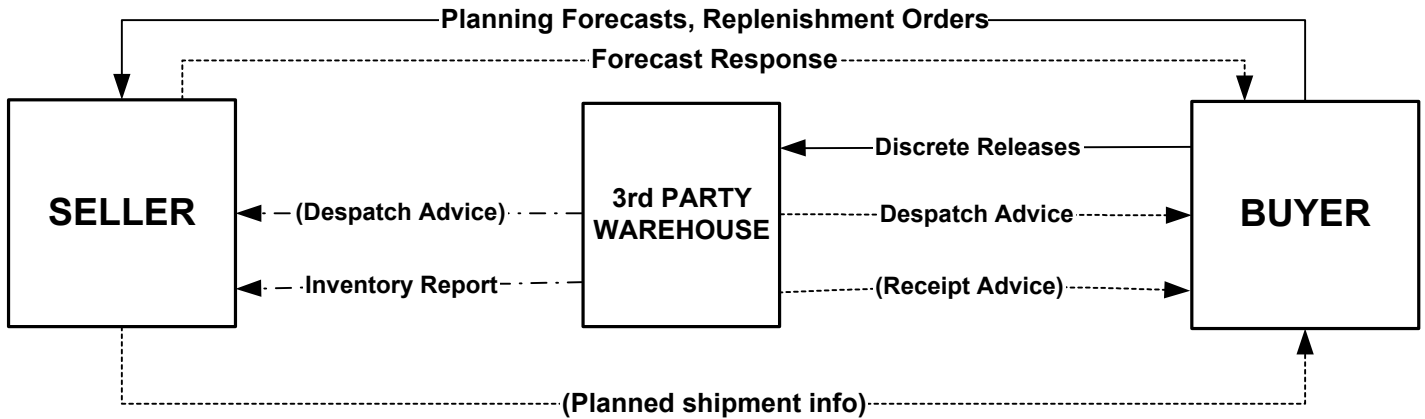
A copy can be sent by the Buyer to the Seller as a control so that the Seller can monitor consumption and see that the replenishment purchase orders are correct.

Forecast:	net quantity, time period, conditions
Forecast Response:	quantity, time period
Consumption:	quantity, date or period, reference number
Inventory:	quantity, date / time
Inventory movements:	last receipts (quantity, date, advice or delivery reference no.) last consumptions, adjustments

Recommended EDIFICE Messages:

Forecast:	DELFOR 'F'
Forecast Response:	DELFOR 'P'
Inventory:	DELFOR or INVRPT
Consumption:	DELFOR or INVRPT, or DESADV (from warehouse)
Inventory Movements:	DELFOR or INVRPT

9.4.3. Consignment Inventory in 3rd Party Warehouse using separate release



The Buyer provides

- medium term gross forecast
- short term (e.g. a few weeks) net demand (DELFOR) to which the Seller may respond.

Inventory is planned and managed by the Buyer, but paid for when goods are despatched from the warehouse.

The Seller needs

- a copy of the DESADV from the warehouse to track consumption
- inventory reports for regular reconciliation (INVRPT).

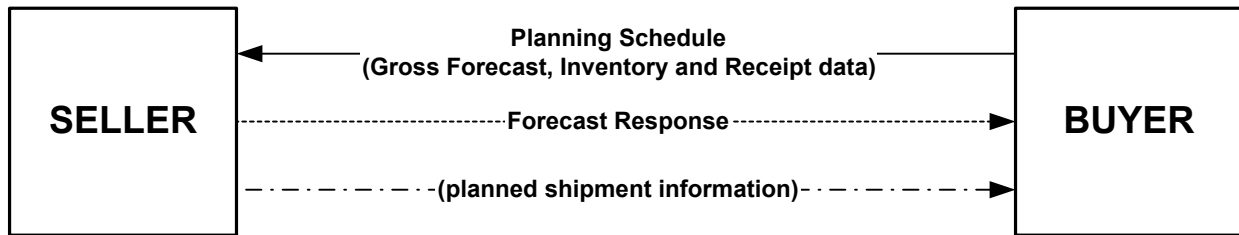
The Buyer pulls deliveries from the warehouse (DELJIT or ORDERS). A copy can be sent by the Buyer to the Seller as a control so that the Seller can monitor consumption and see that the replenishment purchase orders are correct.

Forecast:	net quantity, time period, conditions
Forecast Response:	quantity, time period
Separate release:	net quantity, time period, reference
Consumption:	quantity, date or period, reference number
Inventory:	quantity, date / time
Inventory movements:	last receipts (quantity, date, advice or delivery reference no.) last consumptions, adjustments

Recommended EDIFICE Messages:

Forecast:	DELFOR 'F'
Forecast Response:	DELFOR 'P'
Separate release:	DELJIT
Inventory:	DELFOR or INVRPT
Consumption:	DELFOR or INVRPT, or DESADV (from warehouse)
Inventory Movements:	DELFOR or INVRPT

9.5 Supplier-Managed Inventory (SMI)



This is the standard Supplier-Managed Inventory scenario.

The Buyer sends regular gross forecasts for the supplier, relevant updated inventory target information, actual on-hand inventory and details of receipts. The Seller then calculates required shipments to meet the production and inventory needs, and replenishes accordingly.

The Seller may provide information on planned shipments for the Buyer to monitor and to plan goods reception.

Forecast:	quantity, time period
Forecast Response:	quantity, time period
Inventory:	quantity on hand, date / time
Inventory movements:	last receipts (quantity, date, advice or delivery reference no.)
Inventory Targets*:	maximum quantity, minimum quantity, effectivity dates
Planned Shipments:	quantities, dates

Recommended EDIFICE Messages:

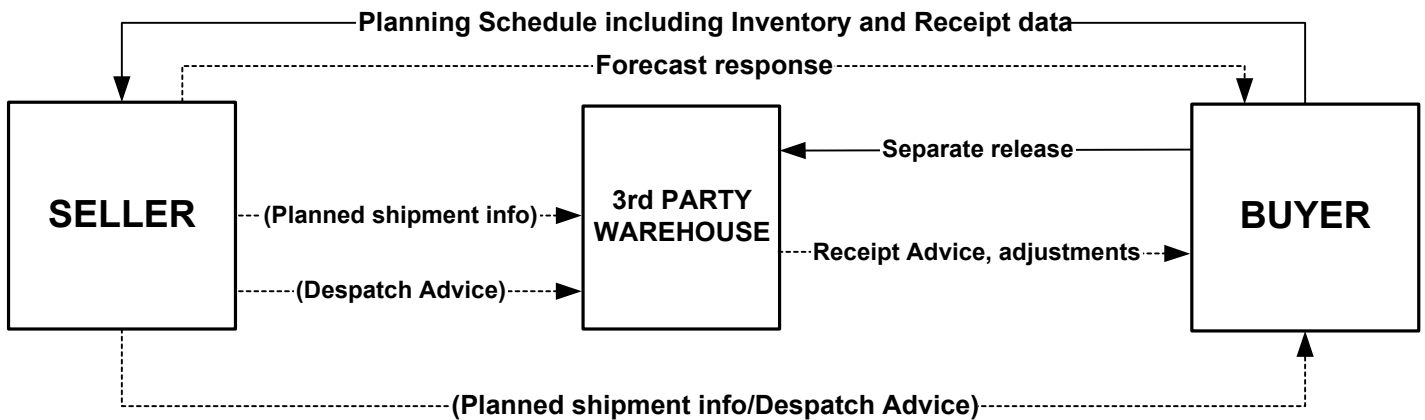
Forecast:	DELFOR 'G'
Forecast Response:	DELFOR 'P'
Inventory:	DELFOR or INVRPT
Last receipts:	DELFOR or INVRPT
Planned Shipments:	DESADV/DELFOR 'P'

One single message, DELFOR, from Buyer to Seller, is recommended for synchronisation of data and ease of processing.

DELFOR messages are typically weekly (related to frequency of forecast updates), but if inventory/consumption is reported on a more frequent basis (for example, daily) then the INVRPT message may be more appropriate.

* Inventory targets e.g. maximum/minimum levels, could be agreed and defined externally, in the supplier's processing application, rather than in every message.

9.6 Supplier-Managed Inventory in 3rd Party Warehouse - Buyer-Owned Inventory



The Supplier-Managed Inventory is held at a 3rd party warehouse. The Buyer has full inventory information from the Warehouse - e.g. receipts and inventory adjustments - and sends separate releases to pull stock from the warehouse into the manufacturing facility.

The Buyer sends a regular planning schedule to the Seller: gross forecasts, on-hand inventory, past due, updated targets, and last receipts. The Seller uses this to calculate necessary inventory replenishment.

The Seller may provide advice of despatch to the Warehouse and might copy the Buyer. Alternatively, the Warehouse would provide an advice of receipt to the Buyer. The Warehouse may issue regular inventory reports for reconciliation / audit by Buyer and/or Seller.

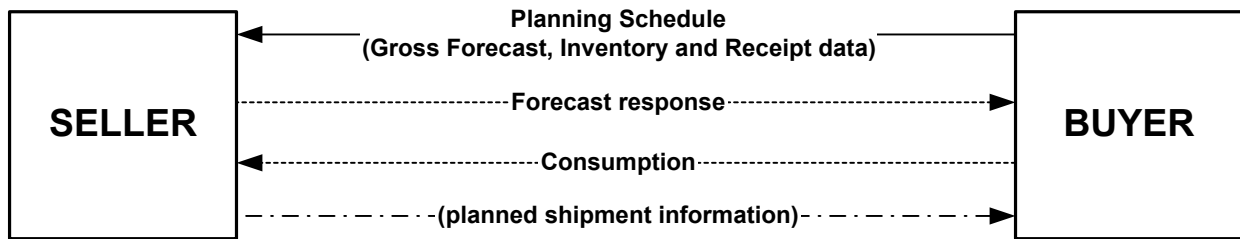
The Seller may advise the Buyer and/or Warehouse of planned shipments, for monitoring inventory / goods inwards resource needs.

Forecast:	quantity, time period
Forecast Response:	quantity, time period
Inventory:	quantity on hand, date / time
Inventory movements:	last receipts from supplier (quantity, date, advice or delivery reference no.)
Inventory Targets:	maximum quantity, minimum quantity, effectivity dates
Planned Shipments:	quantities, dates

Recommended EDIFICE Messages:

Forecast:	DELFOR 'G'
Forecast Response:	DELFOR 'P'
Inventory Movements:	DELFOR (Buyer to Seller), or INVRPT (from Warehouse)
Separate release:	DELJIT or ORDERS (to Warehouse)
Receipts:	RECADV (from Warehouse to Buyer)
Planned Shipments:	DELFOR or ORDERS

9.7 Supplier-Managed Inventory with Consignment



This is a variant of Supplier-Managed Inventory, where the inventory is still owned by the Seller in the Buyer's premises.

The Buyer sends regular gross forecasts for the supplier, relevant updated inventory target information, actual on-hand inventory and details of receipts. The Seller then calculates required shipments to meet the production and inventory needs, and replenishes accordingly.

The Buyer supplies actual consumption data as a basis for the Seller's invoicing process.

The Seller may provide information on planned shipments for the Buyer to monitor and to plan goods reception.

Forecast:	quantity, time period
Forecast Response:	quantity, time period
Inventory:	quantity on hand, date / time
Inventory movements:	last receipts (quantity, date, advice or delivery reference no.)
Inventory Targets:*	maximum quantity, minimum quantity, effectivity dates
Consumption:	quantity, date or period, reference number
Planned Shipments:	quantities, dates

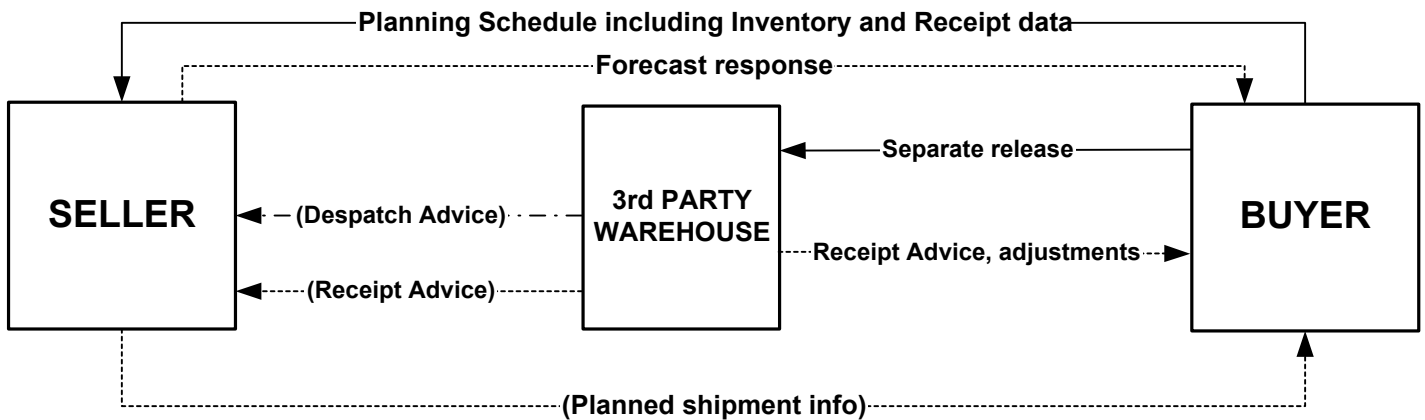
Recommended EDIFICE Messages:

Forecast:	DELFOR 'H'
Forecast Response:	DELFOR 'P'
Inventory:	DELFOR or INVRPT
Last receipts:	DELFOR or INVRPT
Planned Shipments:	DELFOR
Consumption:	DELFOR or INVRPT

Use of one single message - DELFOR - is preferable for synchronisation and ease of processing. However if consumption has to be reported daily, then a separate message like INVRPT is preferable. Daily consumption/inventory data may be used to check inventory levels and if necessary to adjust immediate planned shipments. Daily consumption data may also be used for the Seller's invoicing purposes.

* Inventory targets e.g. maximum/minimum levels, could be agreed and defined externally, in the supplier's processing application, rather than in every message.

9.8 Supplier-Managed Inventory in 3rd Party Warehouse - Seller-Owned Inventory (i.e. Consignment)



The Supplier-Managed Inventory is held at a 3rd -party warehouse (sometimes termed a "Vendor Hub"). In this scenario the inventory is owned by the Seller, in a sort of "consignment stock" arrangement. The Buyer has full inventory information from the Warehouse - receipts and inventory adjustments - and sends discrete releases to pull stock from the warehouse into the manufacturing facility.

The Buyer sends a regular planning schedule to the Seller: gross forecasts, on-hand inventory, updated targets, last receipts and past due. The Seller uses this to calculate necessary inventory replenishment.

The inventory data may be excluded from the planning schedule but sent separately on a more frequent basis.

Where consignment stock is involved, the Seller could be notified of consumption in one of three ways:

- by receiving a copy of the release instructions from the Buyer: this may trigger a replenishment action
- from the Buyer by an advice of receipt
- direct from the Warehouse by advice of despatch (which may also be copied to the Buyer)

Where the consumption information is used to trigger invoicing, then the 3rd option is most likely. If self-billing is in operation, only when goods arrive from the warehouse at the Buyer's premises, then the Inventory data has to include the pipeline from the warehouse to the Buyer, and the Buyer has to advise the Seller of that receipt.

The Seller may provide advice of despatch to the Warehouse. The Warehouse can then respond with an advice of receipt and notify any discrepancies direct to the Seller.

The Warehouse may issue regular inventory reports for reconciliation / audit by the Buyer and/or the Seller.

The Seller may advise the Buyer and/or Warehouse of planned shipments, for monitoring inventory / goods inwards resource needs.

Forecast:	quantity, time period
Forecast Response:	quantity, time period
Inventory:	quantity on hand, date / time
Inventory movements:	last receipts from supplier (quantity, date, advice or delivery reference no.)



Inventory Targets: maximum quantity, minimum quantity, effectivity dates
Planned Shipments: quantities, dates

Recommended EDIFICE Messages:

Forecast:	DELFOR 'L' - 'O'
Forecast Response:	DELFOR 'P'
Inventory:	DELFOR (Buyer to Seller), or INVRPT (from Warehouse)
Last receipts:	DELFOR (Buyer to Seller), INVRPT (from Warehouse)
Separate release:	DELJIT or ORDERS (to Warehouse)
Receipts:	RECADV (from Warehouse to Seller)
Despatches	DESADV (from Warehouse to Seller)
Planned Shipments:	DELFOR or ORDERS

This does not preclude use of DESADV from Seller to Warehouse, or Warehouse to Buyer.

Message synchronisation, and correct calculations of pipeline stocks, are of concern!

Cross Reference Table MIG - PIP

EDIFICE DELFOR BGM	RosettaNet	Frequency	Comments
'A' = Planning forecast.	4A1	Monthly	pre-reservation of capacity
'B' = Planning forecast with traditional purchase order cycle.	4A4 + 3A4		Not recommended
'C' = Planning forecast and separate material release	4A4 + 4D1	Mostly weekly	Recommended to call-off with DELJIT/4D1
'D' = Planning forecast combined with embedded release	4A2	Weekly – could be daily	
'E' = Planning forecast with consignment stock.	4A3	Usually weekly	
'F' = Planning forecast with separate call off, and consignment.			Not used
'G' = Forecast-based Supplier-Managed Inventory	4A3	Weekly or daily	
'H' = Forecast-based Supplier-Managed Inventory with consignment	4A3	Weekly or daily	
'I' = Consumption-based SMI			Not used
'J' = Distributor forecasting and supply	4A4	Mostly weekly	Identical to planning forecast
'K' = SMI in third party warehouse - buyer-owned inventory	4A3	Weekly or daily	
'L' = SMI in third party warehouse - seller- owned inventory (i.e. consignment)	4A3	Weekly or daily	
'M' = Contract manufacturing - Prime contractor procures components			Not used
'N' = Contract manufacturing - Contract manufacturer procures components			Not used
'O' = (Consignment) inventory in third party warehouse	4C1	Mostly daily	Mostly consignment inventory, and snapshot of goods intransit inbound and outbound
'P' = Response to forecast.	4A5	As appropriate	response to any forecast that was made; as per the frequency of the forecast it applies to

Other Messages within FIM scope			
INVRPT FIM	4B3		Consumptions & Receivings
INVOIC SBI	3C7		Self-billing invoice/3C7 also handles consumptions
DESADV	3B2	Event driven or daily	Despatch advice from Supplier to iHub and/or from iHub to Production-line (with copy to Supplier)
RECADV	4B2	Event driven or daily	
DELJIT	4D1		

GLOSSARY OF TERMS

Buyer	The customer party which is purchasing the goods, who will eventually pay for and take ownership of them
Consignment stock	Inventory that is in the physical possession of customers or their agents but which remain the agreed financial property of the manufacturer. The goods are sold to the customer when they are withdrawn from that inventory for use in manufacture or for service or resale purposes.
Customer Managed Inventory	A business process where the customer manages their own inventory and provides forecasts which are net not gross
Delivery Party	Party to whom the goods are delivered
Delivery Point Ship-to	address where goods have to be delivered
Delivery Point Driven	This is when for a given delivery point a number of different products are to be delivered, and address information triggers product information
Delinquency	An order line which was committed by the supplier for delivery at a date prior to the current date, and which is still outstanding
Demand	Information concerning forecasted or firm requirements over a future time period
Electronic Data Interchange (EDI).	Syntax and message standards for the automated exchange of structured information between application systems of separate organisations
Firm Order	An instruction from the buyer to the seller for the shipment of goods. A firm order is frozen in quantity and time and cannot be changed automatically by a computer system, but only by exception with agreement of the parties involved
Forecast	An estimate of future demand
Gross forecast	Estimate of future demand for components derived directly from manufacturing and other requirements, before the netting of on-hand inventory and scheduled receipts
In Transit	Goods which have been registered as having been despatched by the sender, but have not yet been registered as received by the

	consignee
Inventory	Stocks of items used to support production demand, supporting activities (maintenance or repair) and customer service
Inventory Data	Information concerning the quantity in stock at a specific moment in time. Inventory information includes data concerning the changes in Inventory, for example, receipts, consumption, adjustments
Just In Time	A philosophy of manufacturing based on planned elimination of all waste and continuous improvement of productivity. One primary element of J.I.T. is to have only the required inventory when needed
Liability	Legal or financial obligation
Materials Requirements Planning (MRP I)	The generic name for computerised systems which take gross production requirements for manufactured equipment, explode into component part requirements using a "Bill of Materials", and calculate time-phased schedules of needs taking account of work-in-progress, throughput times, manufacturing yields, batch sizes, order quantities etc.
Manufacturing Resource Planning (MRP II)	Manufacturing Resource Planning is a methodology for the effective planning of all resources of a manufacturing company, including functions like business planning, sales and operations planning, production planning, master production scheduling, material requirements planning, capacity requirements planning, and execution support.
Net forecast	In Manufacturing Resource Planning, the net requirements for a part are derived as a result of applying gross requirements against inventory on hand, scheduled receipts and planned safety stock
On-hand Inventory	Quantity physically in stock at the time of reporting (normally end of the day) after all in- and out-movements have been taken into account.
Past Due Order	A line item on an open order which has an original scheduled date which is earlier than the current date
Response	Information concerning the supplier's capability for meeting demand.

Schedule	A timetable for planned occurrences, e.g. shipping schedule, manufacturing schedule, supplying schedule
Scheduling Condition	<p>A qualifier associated with each of the dates on a requirements schedule which defines the degree of liability for the customer to take that firm or forecasted quantity. The legal commitments should be normally defined in a contractual agreement which acts as a framework for the scheduling process:</p> <ul style="list-style-type: none">1 - firm instruction for Seller to ship goods - 100% commitment2 - firm commitment by Buyer for liability for manufacturing but not for shipping3 - firm commitment by Buyer for liability for raw material acquisition but not for manufacturing/shipping4 - forecast data only, with no liability
Seller	The vendor party which is supplying the goods, and which will eventually get paid for them
Self Billing	Business procedures where the invoice document or message is raised by the customer instead of by the supplier
Separate release	Firm quantity required to be delivered at short notice, having been previously forecasted or planned. Normally the result of Just In Time process.
Shipment	A separately identifiable collection of one or more goods items (available to be) transported together from one physical location to another
Shipment Information	Information concerning the actual or planned despatch of goods
Supplier-Managed Inventory (SMI)	A business process where the supplier is responsible for maintaining the customer's inventory, and deciding what product should be shipped when.
Vendor Managed Inventory (VMI)	Another term for Supplier-Managed Inventory.
3 rd Party	A party involved in a business process other than the Buyer or the Seller.