The "Upstream Integration Model"

VERSION 2.3

A foundation for global upstream supply chain improvements

gusi

GLOBAL UPSTREAM
SUPPLY INITIATIVE

The Consumer Goods
FORUM

Introduction & Acknowledgement

This is a follow-up report from a group of global manufacturers and suppliers called **Global Upstream Supply Initiative** (GUSI). This group is committed to driving improvements in upstream supply chain performance between manufacturers and suppliers in the consumer packaged goods industry. Since the publication of version 2.2 of the report, the GUSI group has been-absorbed into the **Consumer Goods Forum.**

The version 2.3 differs from the version 2.2 document in one item:
• Logistic Labelling is covered in a generic way.

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Executive Summary

The **Consumer Goods Forum** working group of manufacturers and material suppliers called the **Global Upstream Supply Initiative (GUSI)** has identified areas within the upstream supply chain where integration and interoperability amongst manufacturers and suppliers would provide benefits to the supply chains operated upstream.

The group's focus is on gaining benefits from electronic communications between manufacturers and their suppliers of direct materials (e.g. ingredients, raw materials and packaging) on a global basis. In this space the group believes that the industry can gain efficiencies and reduce cost in every link in their upstream supply chains. A detailed business case is being complied by the **GUSI** group to build upon existing industry reports (e.g. the **ECR** Europe report on "Integrated Suppliers") and to demonstrate the potential savings and performance improvements that can be achieved by both manufacturers and suppliers.

Some of the **GUSI** group members have already experienced significant benefits by implementing information technology solutions to share information and documents and to use this improved information flow to operate more efficient supply chains. It is these proven results that drive the momentum for change within the group.

However these same companies know that industry-wide benefits can only be achieved by having a scale of global manufacturers and suppliers working in a common way. The group therefore examined the various activities that would be needed to break through this scaling barrier and decided that a critical foundation element needed was a framework and set of standards that all parties could use in thei solutions.

Therefore the "**GUSI** working group" was established to develop a set of standards that all parties could use in their solutions.
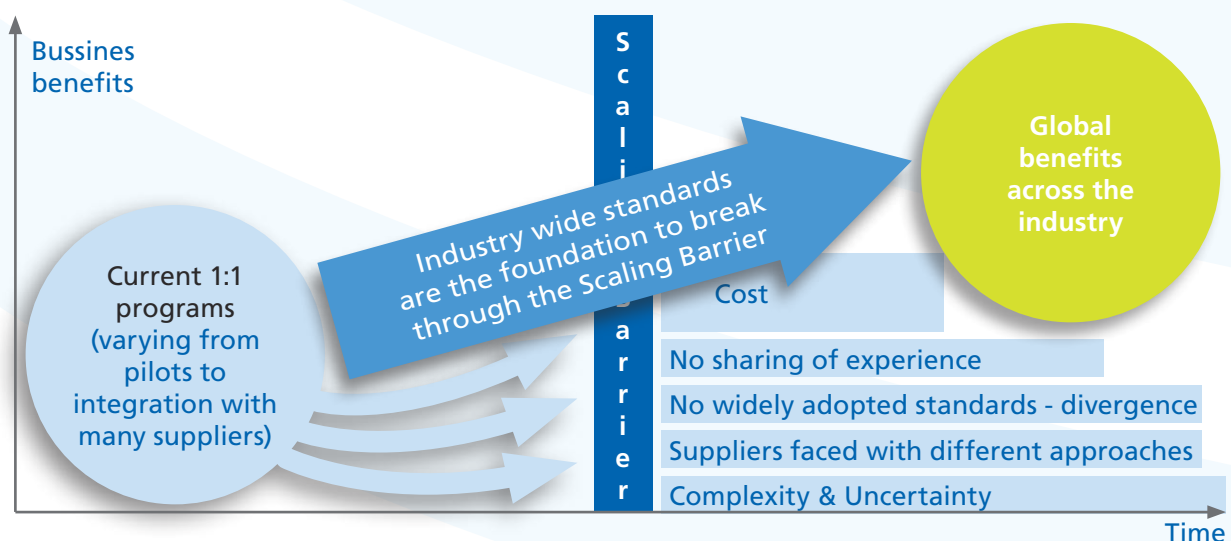
The working group leveraged previous work carried out by industry organisations and standardisation bodies such as ECRw, GS1, etc. It further developed the findings of the version 1 Upstream Integration Model (UIM) from September 2003.

The main thrust of the findings has been the need for a "common language" for electronic business interactions between trading partners covering businesses processes in addition to data exchange standards. The Upstream Integration Model (UIM) was developed to meet this need.

The UIM standardises the business processes and data interchanges upstream between manufacturers and suppliers for use in electronic communications and covers needs in the following business areas:

    Procurement
    Material forecasting
    Inventory management
    Demand & Supply
    Despatch, Receipt & Consumption of Materials
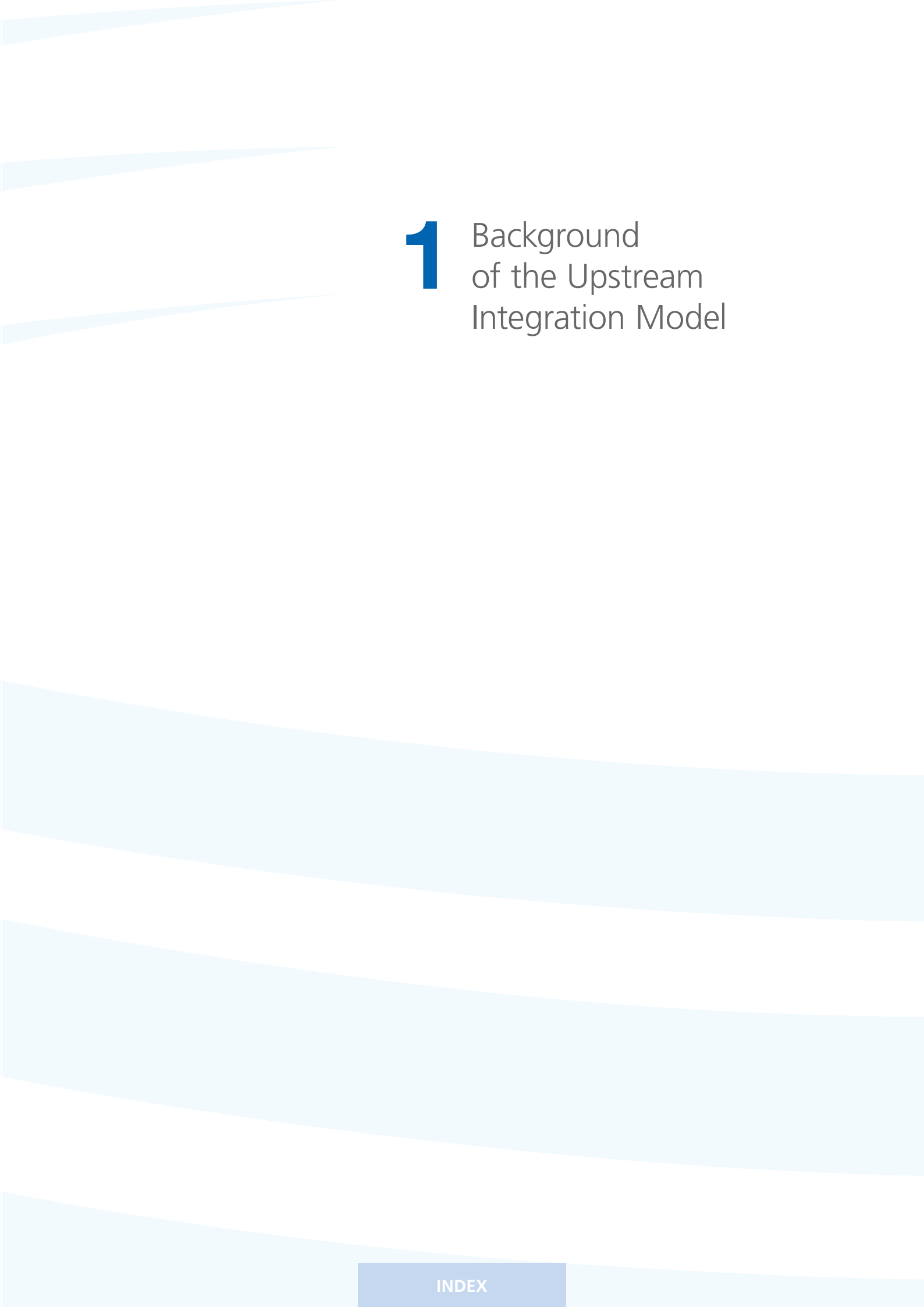   Financial Settlement

By adopting this model manufacturers and suppliers will have a common language for the processes and data interchanges within their electronic integration relationships. Also, adopting the model allows companies initially to maintain their existing internal processes and translate them into a common "language" that all other parties will be using for electronic commerce. Over time there may also be benefits in migrating their internal processes and systems to make use of the UIM.

The working group understands its role as laying the groundwork to a standardised, industry-wide process. The group made an initial decision to limit the number of involved companies in order to gain speed during the first phases of the initiative. However, the involved companies are committed to open and broad integration and interoperability among all industry players and indeed the working group has grown to include a broad array of manufacturers, suppliers, industry bodies and service providers who are keen to build on standards and drive major productivity increases for all parties.

This version of the UIM is the first to include topics not covered previously. Version 2.3 differs from the 2.2 version in that logistic labelling is covered in a generic way plus it includes a new message, the Order Response Message (OR).

It is also worthwhile mentioning that this document is completely backwards compatible with version 2.2.

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1 Background of the Upstream Integration Model

1.1   Business Rationale

The current situation in the upstream supply chain of the CPG industry is that all manufacturers and suppliers are faced with different business processes and data interchanges when they move into more integrated relationships. Different business processes and approaches create a barrier to the scalability of integration efforts whilst also imposing many costs: the time and money spent making transactions; the delays caused by the need for corrections; plus inevitable information gaps and misunderstandings.

Both parties should obtain benefits from integration, among them improved visibility of demand and demand changes and reduced inventory. Today, to access these benefits, each program between manufacturer and supplier has to establish its own framework for process definitions, item and location coding and in many cases message content. This is both a wasteful process and in itself presents a significant barrier for scaled adoption. For example a supplier is often faced with the challenge to integrate with multiple manufacturers, each one with its own definition of the above factors.

The existence of a framework based on industry standards overcomes the described barriers and:

a) Creates a common definition of the business processes involved in upstream integration and how they link together. This creates a "common language" that can be used in all electronic communications by all parties. It also goes beyond the existing standards that are mainly focused on data interchange definitions.

b) Supports and strengthens relationships between integrated manufacturers and suppliers through one common standard and reduced complexity.

c) Increases efficiency through better visibility of planning, forecasts, production, reduced inventory, reduced re-work and waste.

d) Provides a foundation to enable business programmes to be implemented in a common way thereby:

1. Reducing complexity.

2. Reducing implementation costs (including IT costs).

3. Accelerating adoption and implementation (by enabling the scalability).

e) Enables solution providers to build solutions that can be used by all parties.

f) Provides a basis for reviewing and adopting internal processes – while still allowing to keep the internal processes as-is and "translating" them into the common language proposed in the UIM model.

The working group has taken into account existing standards and work undertaken by previous projects. In particular it has built on work sponsored by ECR Europe (The concepts of "Integrated Suppliers" of Ingredients, Raw Materials and Packaging report as published in March 2002 by ECR Europe and Fraunhofer Applications Centre for Transport Logistics and Communications Technology).

The ECR "Integrated Suppliers" report summarised the concept of 'Integrated Suppliers' as follows:

"Integrated Suppliers is a concept for impro-ving the part of the supply chain between manufacturers and the tiers of suppliers of ingredients, raw materials and packaging. By sharing information both parties are able to exercise judgement on costs, quantities and timing of deliveries and production in order to stream line the production flow and to move to a collaborative relationship."

Where the ECR report was about the 'supplier driven' continuous replenishment processes, (supplier recommends the order to the manufacturer) it did not include 'manufacturer driven' ordering processes. The UIM covers both aspects and covers more elements that can be improved in the manufacturer/supplier relationship - for example, next generation electronic data exchange based on exception management.

1.2 Case for using existing GS1 item and location coding standards

A significant change proposed is that manufacturers and their suppliers should adopt the GS1 standards for item and location coding to create a common coding system across the supply chain - downstream as well as upstream. It is felt that the time is right for this move given that:

a) There is strong manufacturer commitment to the GS1 standards.

b) There is an increased manufacturer momentum to build automated solutions that will scale.

c) There is increasing supplier awareness of the inefficiencies of the existing methods.

d) A "Case for GTIN " document has been published by the GUSI team which encourages all companies active upstream to use the GS1 numbering system applying Global Trade Item Numbers (GTIN) and Global Location Numbers (GLN).

e) There are new technologies expected over the next few years that will be based on existing GS1 standards. By adopting the existing standards, suppliers will be able to migrate to these new technologies. An example is the emerging use of Radio Frequency Identification (RFID). To use RFID companies will need to adopt the new GS1 Electronic Product Code (EPC) Network being developed. The EPC will provide a coding structure for radio frequency tags enabling individual items or groups of products to be tracked across the supply chain. The existing GS1 item-coding standards are embedded in the new EPC structure. It therefore provides a good first step towards new RFID-based solutions.

The recommended GS1 standards for identification to be used in combination with the UIM are:

> "Global Trade Item Number" (GTIN): a unique and international EAN•UCC number is assigned to each trade item or to a standard grouping of trade items. This number is known as the GTIN. Each GTIN data structure is represented by a bar code symbol. This allow for the identification numbers to be scanned for automated data capture and electronic data processing.

> Global Location Number (GLN). Location numbers are a key concept in supply chain management. A location number is a numeric code that identifies any legal, functional or physical entity within a business or organisation. The identification of locations is required to enable an efficient flow of goods and information between trading partners through electronic messages to identify the parties involved in a transaction (e.g. buyer, supplier, place of delivery, place of departure).

> Serial Shipping Container Code (SSCC). The SSCC identifies uniquely the logistic unit and is the key information to retrieve all shipping unit properties in information systems.
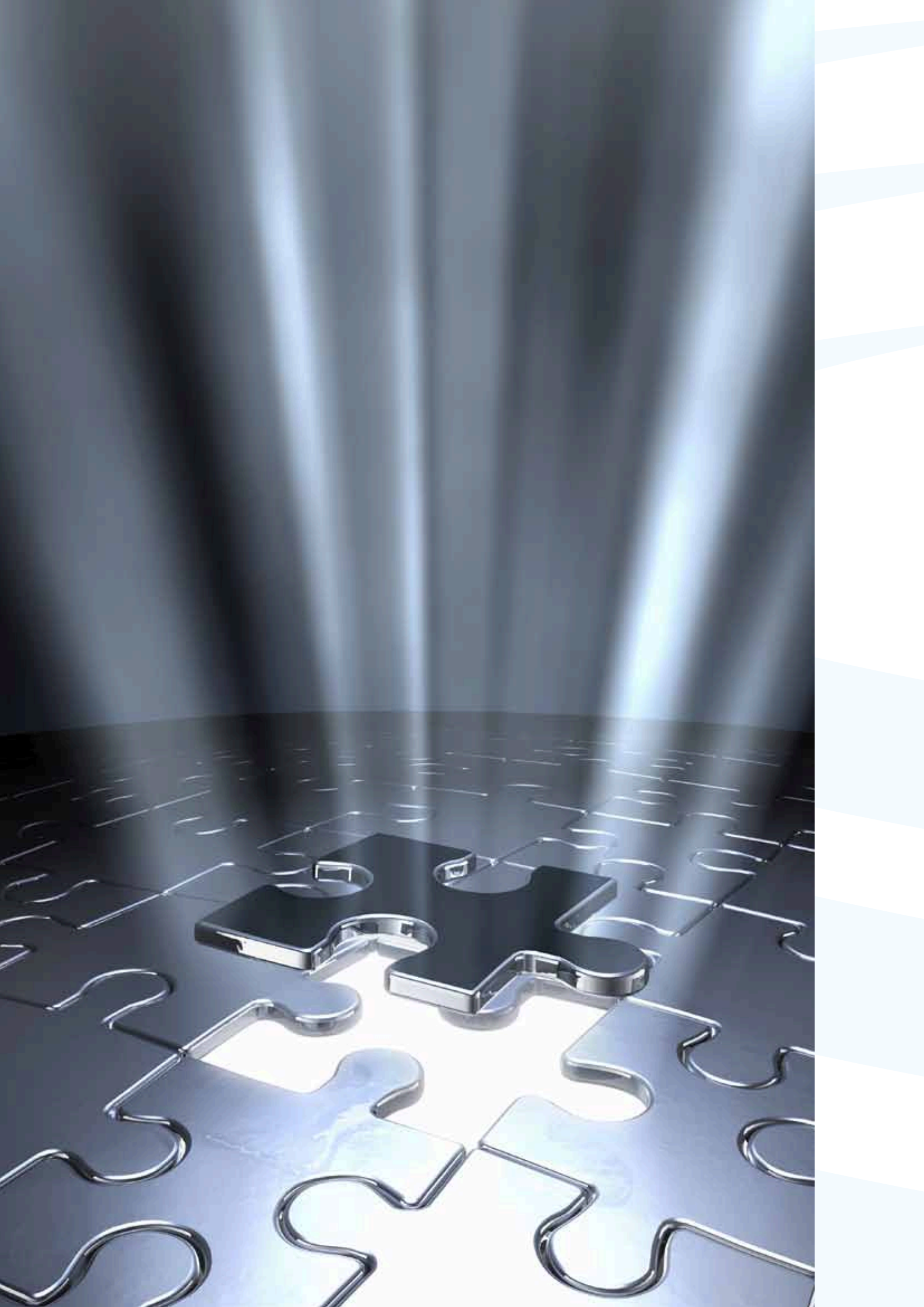
2 The Upstream Integration Model

The **UIM** describes common business processes and data interchanges to support upstream interoperability between manufacturers and suppliers. By engaging in such an integration effort, business partners wish to:

- Create value in the supply chain for mutual benefit

- Apply practical solutions fitting the nature of their business

- Share and synchronise data and processes

- Co-manage the materials lifecycle through the definition of business rules

- Apply industry standards

- Push the concepts through the whole supply chain

It has been designed to meet the major electronic communication needs in the following business areas:

- Procurement
- Material forecasting
- Inventory management
- Demand & Supply
- Despatch, Receipt & Consumption of Materials
- Financial Settlement

By adopting this model manufacturers, suppliers and third parties will have a common language for the processes and data interchanges within their electronic integration relationships.

To achieve this, the model contains very specific definitions of process terms, data exchanges and their content. Adopting the model allows companies to translate their internal processes and approaches into a common language that all other parties will be using.

The **UIM** structure creates a common set of definitions that all parties can use, whilst still allowing them to use their own internal definitions and processes, possibly with a requirement to translate internal information into the standard structure of the **UIM**.

The concept of the model is based on six building blocks, structured as per Figure 2 below:

The **UIM** offers an approach to both supplier- and manufacturer- initiated ordering processes and addresses the most common variants of them based on either a manufacturer or supplier driven scenario.

The "manufacturer driven" scenario describes a situation when orders are initiated by the manufacturer and sent to the supplier. This scenario is also known as "Traditional Order Management (TOM)". **TOM** is specifically appropriate:

- when the supplier and the manufacturer operate synchronised planning (with low stocks on both sides).

- when the demand forecast accuracy is low (horizon = manufacturing lead-time) or where there are irregular, seasonal or promotional

| INTEGRATION AGREEMENT | MASTER DATA ALIGNEMENT | PURCHASE CONDITIONS |

Fig. 2. UIM Building Blocks. *Source: GUSI working group*

items; phase-in/phase-out stage of the product life cycle.

In the "supplier driven" scenario the supplier recommends or establishes the order to the manufacturer based on the manufacturer inventory data and/or consumption forecast. This last one is widely known as "Supplier Managed Inventory (SMI)".

The implementation sequence of the UIM follows the order shown in Figure 2 above and starts with the "Integration Agreement".

The UIM can be used by trading partners starting from scratch or by those who have implemented the integration of some of the building blocks in the past. In the last scenario, companies might need to adjust some of the processes or information interchanges in order to accommodate differences of the UIM building blocks.

Although the implementation of the UIM is outside of this report, it is important to specify that the implementation costs of the UIM will vary widely from one company to another, depending on factors such as its current IT landscape, its current usage of standards and the ambition level of the implementation.

The data interchanges are based upon **GS1** e-commerce standards that enable communication between companies world-wide. Converting the output of each company's **ERP** system to the **GS1** standards will allow a reduction in the implementation effort needed to integrate with many business partners.

Figure 3. Page 19.
Provides an overview of the UIM.

Upstream Integration Model (UIM)

The **UIM** consists of six building blocks (groupings of business processes) as shown in the diagram below. The **UIM** establishes clear links between each group of business processes and the interchange of the relevant data for these processes. All relevant processes are illustrated below. However it is understood that the business scenario applied will drive which messages will be exchanged.

DEMAND & SUPPLY SIGNALS

DESPATCH, RECEIPT & CONSUMPTION

FINANCIAL SETTLEMENT

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Guiding principles for processes and messages

When defining the processes and messages as illustrated in this report, the working group agreed on the following guiding principles:

> Application of **GS1** standards (e.g. usage of **GLN** and **GTIN**, as well of the Logistic Label and the **SSCC**)

> Processes and messages have been developed on a logical level, i.e. from a content point of view. The technical requirements of processes and messages (such as technical message design and technical acknowledgements of messages) have not been taken into consideration, as it is understood to be covered in the next standardisation phase.

> The objective of the **UIM** is to have a standardised approach to integrate among business partners, enabling an efficient scalability. However, it is understood that the scenarios recommended in the **UIM** report version 2 and the usage of the messages within these scenarios might need to be modified depending on the business scenario applied, i.e. a message might need to be exchanged despite the fact that it is not illustrated in the basic scenario (e.g. communication of manufacturer inventory in a **TOM**-consignment business scenario) or messages not adding value to the overall process might not be exchanged even though they are reflected in the basic scenario.

> The flexibility of the messages needs to be ensured in order to allow an industry-wide

and global applicability; as a consequence, messages should allow to be organised in the following ways:

- by plant across items/materials
- by item/material across plants
- by plant and item/material

  ¤ this has been ensured by including specific content fields on Header and on Detail level in the message. These fields might be optional in both levels or might need to be filled in either one of both. Depending on whether the Header or Detail field of the message is filled, the message will be organised by plant/item/material etc.

- Remarks to message structure:

  ¤ **Header:** this section is valid for all categories (items, locations, etc.) mentioned in the detail level

  ¤ **Detail:** this section can specify multiple categories (items, locations, etc.) grouped under the header information.

The messages describe the logical data elements per data interchange based on EANCOM or XML. Specific details on the semantics are not included as they are not part of the scope of this report.

More than **EANCOM** (based on Edifact), XML (the **GS1** XML standard based on ebXML) offers the opportunity to become the one single global standard for business process data interchange. XML is also a move to next generation data interchange that is characterised by:

> The move to more real-time data exchange instead of the batch-oriented exchanges of the past

> The focus on exceptions rather than sending and confirming whole batches of data. At the same time it is understood that some messages need to be exchanged with full detail level in order to comply with legal or internal process or system requirements.

> The tight link to the actual business process and integrated data interchanges e.g. one data interchange for the Replenishment Forecast which includes material forecast and inventory data per item instead of two separate data exchanges for material forecast and inventory.

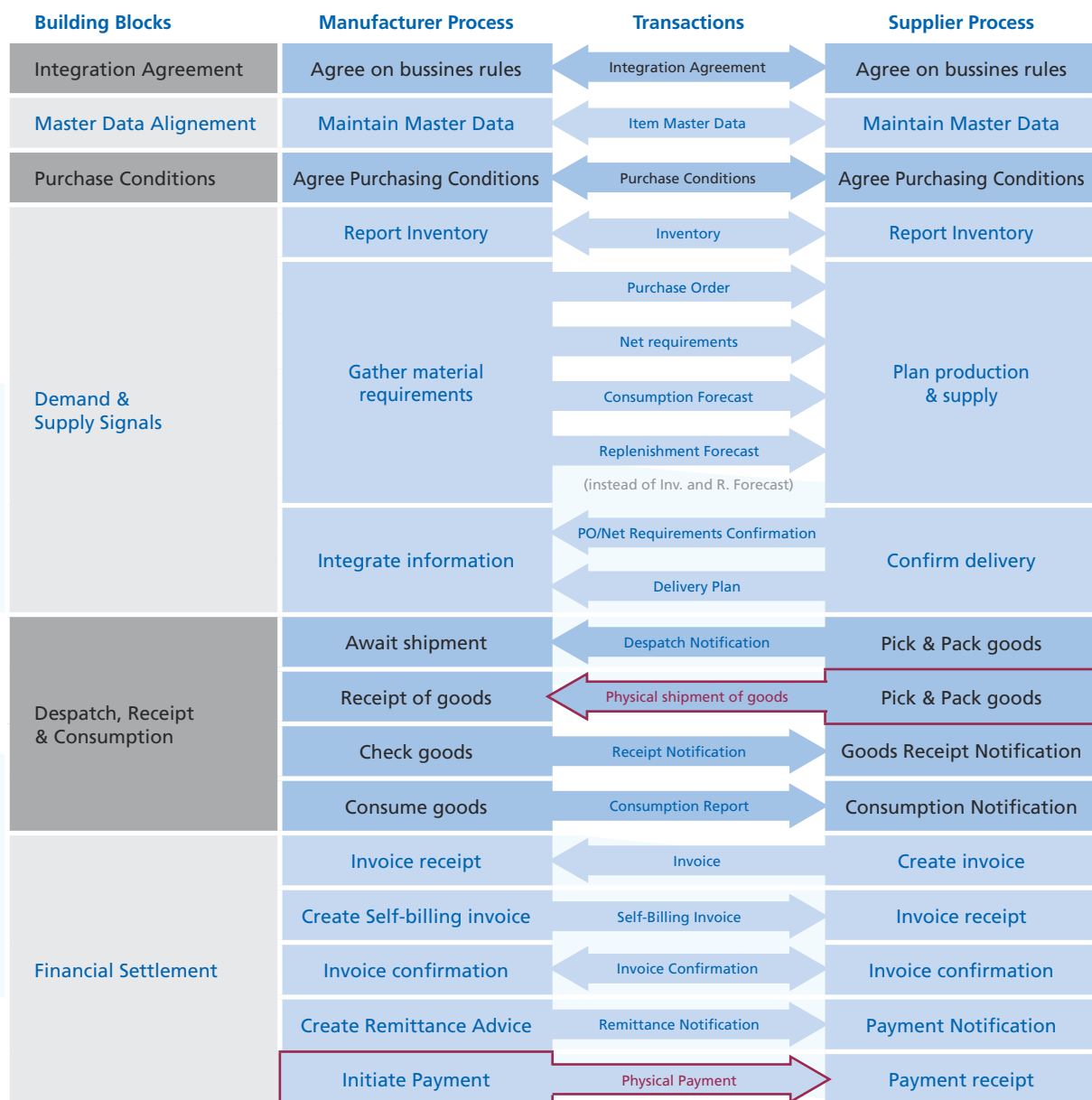| Building Blocks	Manufacturer Process	Transactions	Supplier Process
Integration Agreement	Agree on bussines rules	Integration Agreement	Agree on bussines rules
Master Data Alignement	Maintain Master Data	Item Master Data	Maintain Master Data
Purchase Conditions	Agree Purchasing Conditions	Purchase Conditions	Agree Purchasing Conditions
Demand & Supply Signals	Report Inventory	Inventory	Report Inventory
	Gather material requirements	Purchase Order	Plan production & supply
		Net requirements	
		Consumption Forecast	
		Replenishment Forecast (instead of Inv. and R. Forecast)	
	Integrate information	PO/Net Requirements Confirmation	Confirm delivery
		Delivery Plan	
Despatch, Receipt & Consumption	Await shipment	Despatch Notification	Pick & Pack goods
	Receipt of goods	Physical shipment of goods	Pick & Pack goods
	Check goods	Receipt Notification	Goods Receipt Notification
	Consume goods	Consumption Report	Consumption Notification
Financial Settlement	Invoice receipt	Invoice	Create invoice
	Create Self-billing invoice	Self-Billing Invoice	Invoice receipt
	Invoice confirmation	Invoice Confirmation	Invoice confirmation
	Create Remittance Advice	Remittance Notification	Payment Notification
	Initiate Payment	Physical Payment	Payment receipt

Fig. 3. Upstream Integration Model (UIM). *Source: GUSI working group*

3 Basic Demand & Supply Business Scenarios

Following main business scenarios have been identified as relevant in the context of supply chain interaction between manufacturers and suppliers:
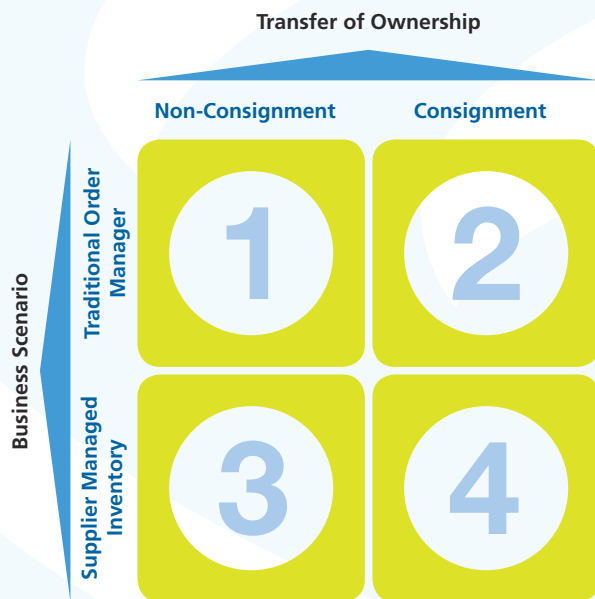
Transfer of Ownership

Non-Consignment | Consignment

Business Scenario

Traditional Order Manager

Supplier Managed Inventory

1   2

3   4

Fig. 4. Basic Business Scenarios & Transfer of Ownership. *Source: GUSI working group*

1. Manufacturer driven scenario – Tradition Order Management (TOM) without Consignment

2. Manufacturer driven scenario – Tradition Order Management (TOM) with Consignment

3. Supplier driven scenario – Supplier Managed Inventory (SMI) without Consignment

4. Supplier driven scenario – Supplier Managed & Owned Inventory (SMOI) – also referred to as SMI with Consignment

In the "Traditional Order Management" (TOM) business scenario the manufacturer's material requirements will be calculated by the manufacturer and the manufacturer will initiate the demand signals. The manufacturer can communicate his requirements through sending a Purchase Order and/or his Net Requirements to the supplier.

TOM can be operated with non-consignment and with consignment stock, although the GUSI group has found very few examples of TOM with consignment stock.

TOM applies to a large spectrum of business interoperability scenarios: spot order, seasonal or promotional business, synchronised planning, etc - in fact, all scenarios where the Manufacturer is best party to generate the demand.

In the "Supplier Managed Inventory" (SMI) business scenario the supplier is committed to calculating the order size and planned delivery timings, using the information in the Replenishment Forecast (or Inventory and Consumption Forecast) received from the manufacturer together with information from his own operations.

To do this the supplier must receive the relevant data to enable him to work out the stock equation. The variables that are required for the calculation include stock in transit, stock at the manufacturer, stock in the supplier's own warehouses, any other inventory in the supply chain plus the commonly agreed inventory window.

The supplier then might combine this with the material forecast from the manufacturer to calculate the actual demand of components or materials and based on his own internal production etc. the dates when they will be delivered. The resulting information is provided to the manufacturer, e.g. in the form of a delivery plan.

Consignment stock characterises a business scenario, where the goods delivered to the manufacturer remain in possession of the supplier until defined points of consumption. Typically, consignment stock can be used in "Supplier Managed Inventory" (SMI) scenarios, also known as SMOI (Supplier Managed & Owned Inventory) as the supplier will then manage the

"own" stock at the manufacturer site. An overview on existing consignment models can be found in the appendix. SMI can be conducted with both non-consignment and consignment stock. When SMI is used with consignment stock, i.e. SMOI (Supplier Managed & Owned Inventory), the stock's ownership (managed by the supplier) will remain with the supplier until the manufacturer consumes the goods.

Demand & Supply Business Scenario Selection

Business partners need to define the appropriate business rules to co-manage the supply and demand information through the materials lifecycle, within the context of their business environment. In this context, master data, forecast and inventory are the basic elements for interoperability.

As illustrated by the following charts that can be used to map the materials and select the most appropriate scenario for each of them :

HIGH			
REPEATER	RUNNER	=REGULARS	
STRANGER	SEASONAL/PROMOTIONAL	=IRREGULARS	
LOW	VOLUME	HIGH	

FREQUENCY OF SALES

Fig. 5. Materials Mapping by Volume and Frequency of Requirements
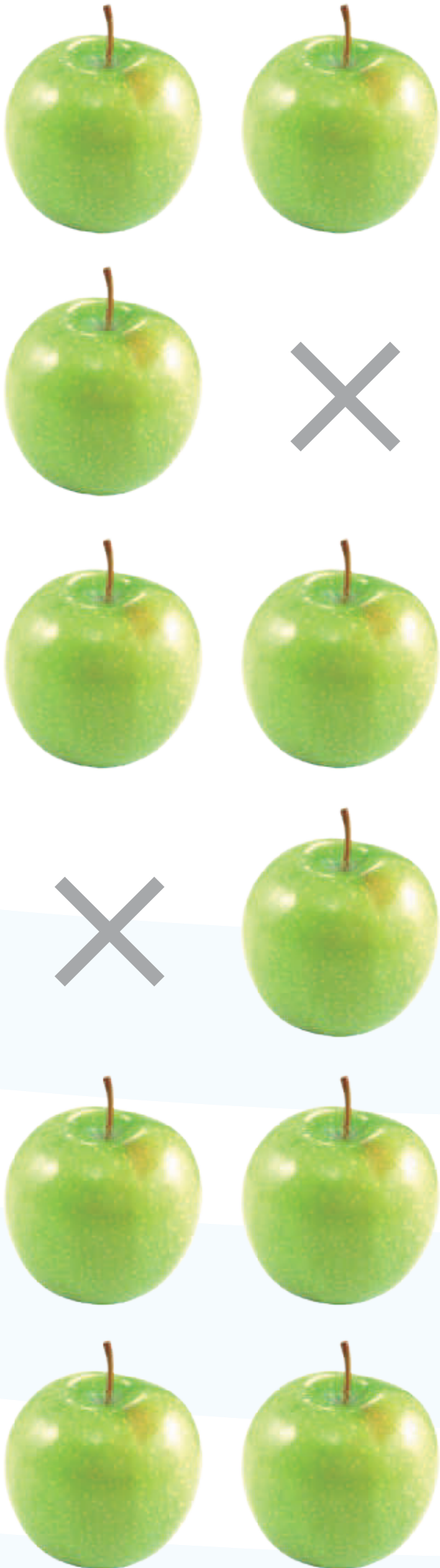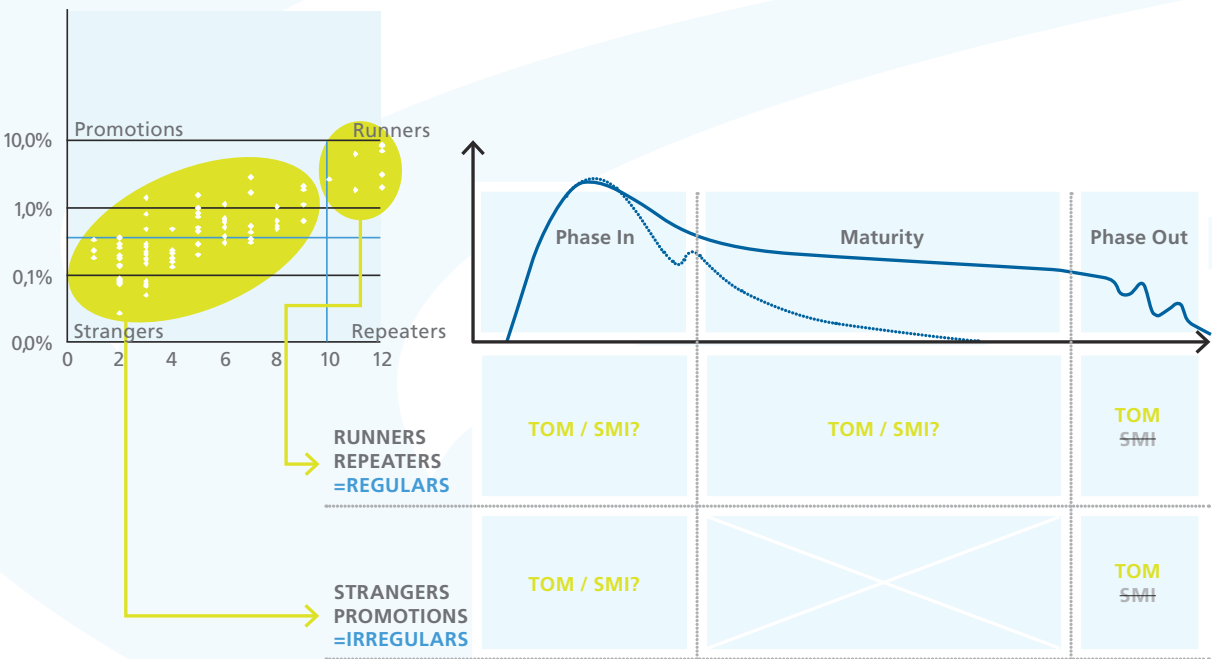
Fig. 6. Materials Mapping by Position in the Lifecycle

Building Blocks	Manufacturer Process	TOM	Supplier Process
Demand & Supply Signals	Report Inventory	Inventory →← Inventory	Report Inventory
	Gather material requirements	Consumption Forecast → Replenishment Forecast →	Gather material requirements, Plan production & Supply
	Integrate information	← Delivery Plan	Confirm delivery

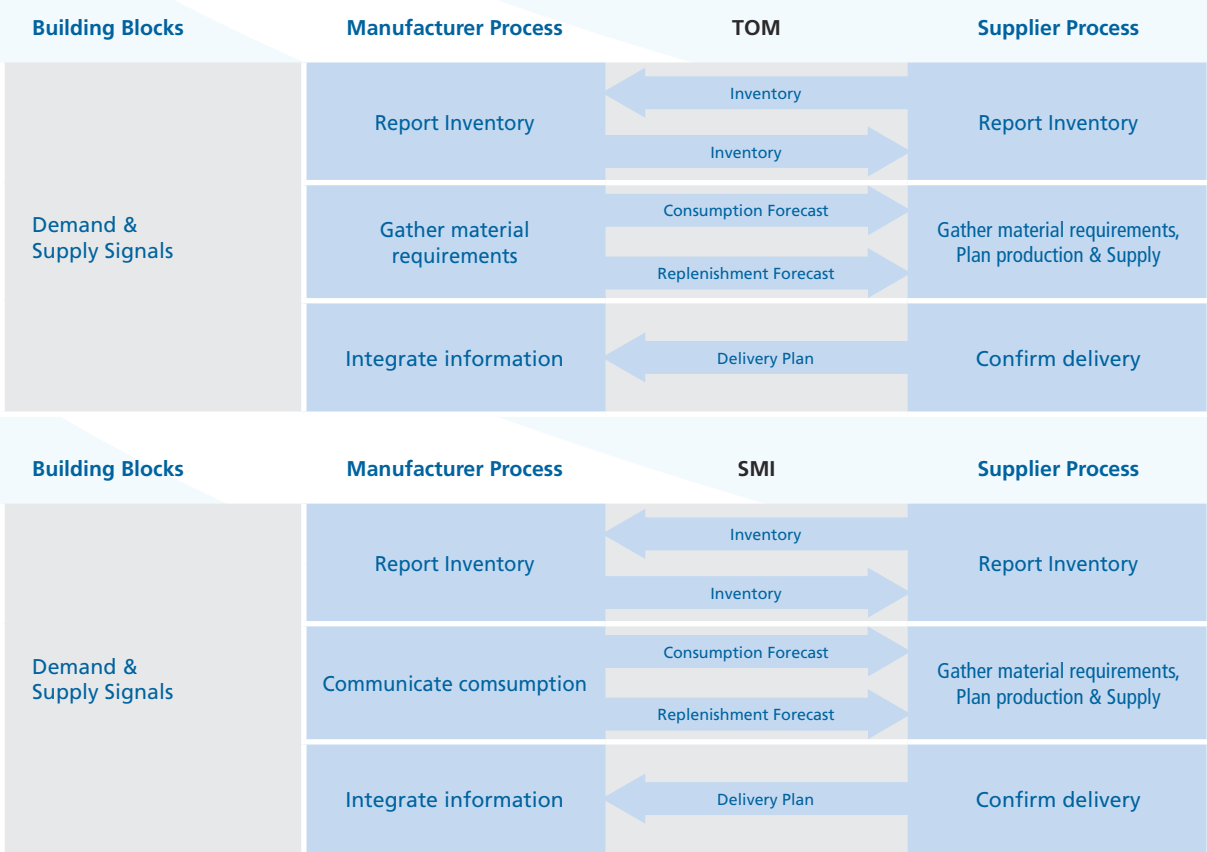| Building Blocks	Manufacturer Process	SMI	Supplier Process
Demand & Supply Signals	Report Inventory	Inventory →← Inventory	Report Inventory
	Communicate comsumption	Consumption Forecast → Replenishment Forecast →	Gather material requirements, Plan production & Supply
	Integrate information	← Delivery Plan	Confirm delivery

Fig. 7. Demand & Supply Signals. *Source: GUSI working group*

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- During **"Phase Out"**, the focus is to make sure that there will be as less as possible remaining stocks in the supply chain. Any production has to be committed by the manufacturer.

- During **"Phase In"**, the focus is meeting the lead-time in filling the supply chain, inventory is not an issue. SMI parameters may be difficult to define as the material's profile is not yet known. Visibility over future demand may as well be limited.

After the selection of the appropriate demand & supply scenario at item level, business partners need to take a practical approach and may decide to apply the most common scenario to the whole portfolio.

At the messages level, TOM and SMI only differentiate themselves by the way Demand & Supply Signals are handled. The other building blocks are common to both scenarios.

Serial Shipping Container Code (SSCC) on the logistic label will confirm that these goods have been loaded. The information can be used in connection with the despatch advice.

- Receipt of goods: The scanning of the Serial Shipping Container Code (SSCC) on the logistic label will confirm that these goods have arrived.

- Generate receipt notification: Good receipts are based on the highest level of packaging for which a SSCC is available. The packaging unit is as identified in the despatch notification and must be labeled according to GS1 logistics label standards.

- Consumption of goods: A last scan of the label SSCC allows the system to record traceability up to the consumption point. Consumption can be triggered by the scan of the SSCC bar-coded on the label.

GS1 Logistics Label

Logistic labels by identifying uniquely logistic units play a key role to ensure an error-free alignment of physical and information flows.

Information about products can be obtained scanning the logistic label barcode , applied on each logistic unit at the end of the production line, and which contains the Serial Shipment Container Code (SSCC) . The SSCC identifies uniquely the logistic unit and is the key information to retrieve all shipping unit properties in information systems.

Depending on the underlying scenario, labeling will have the following impact.

- **Despatch of goods: The scanning of the**

Fig. 8. Example of possible scanning points in "Despatch, Receipt & Consumption TOM & SMI without consignment". *Source: GUSI working group*

	Pick & Pack goods **1**
3 Await shipment & integrate information in ERP system	
← Dispatch Notification	**Generate Despatch Notification and Ship goods** **2**
← Physical shipment	
4 Receive goods	
5 Check received goods against despatch notification and create Goods receipt	Receipt Notification → **Integrate information in transaction system** **6**
Identify discrepancies → Resolve exceptions ← **Identify discrepancies**	
7 Consume goods	

▬ Manufacturer	▬ Supplier	→ Common	▭ Optional	▬ Label scanning point

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GUSI recommendations on logistic labeling:

- In data communication between partners, as supported by GUSI messages, the use of SSCC's in message based communication is a decision that in the end needs to be made between manufacturer and supplier, allowing synchronization between physical flows of goods and related information to them.

- The GTIN (Global trade identification number) and SSCC (Serial shipping container code) contained in GS1 logistic label and in GUSI Dispatch Advice message that ensure this link between the two flows.

Standards for codification and logistic labeling are maintained by GS1 who publishes guidelines, e.g "GS1 Europe Logistic Label - Guidelines" or "EAN UCC Guide For Upstream Industries" that can be used as references for easy implementation.

4 Building Blocks & Business Processes

| Integration Agreement | Master Data Alignment | Purchase Conditions | Demand & Supply Signals | Despatch, Receipt & Consumption | Financial Settlement |

4.1 Building Block 1: Integration Agreement

Scope

The "Integration Agreement" represents the first of the UIM building blocks. Its scope is the agreement on the operational and tactical elements of supply chain integration between manufacturers and suppliers.

It contains the following components for which the business rules have to be defined: planning and stock management, delivery, payment, claims, performance measurements, systems security, confidentiality/non-disclosure agreement, and quality rules. It also defines the technical, clerical and computing methods by which integration between supplier and manufacturer will occur including performance expectations, ERP software and versions used and data privacy etc.

Description

The trading partners will define the approach to demand planning and logistics strategies, and they must agree jointly the expected order volume, order timelines and delivery requirements, transportation modes and carrier list/alignment. The agreement could also state how quotations will be structured and at which point of time these quotations will be communicated by the supplier to the manufacturer. In its simplest form it would address lead-time, delivery, ordering process and service levels.

Integration Agreements cover the tactical operational rules for inventory target setting, data visibility, acceptable levels of demand variability and the appropriate supply responses, delivery options, planning buckets and supplier lead-times, supplier production authorisation (e.g. how many weeks of requirements may be produced by the supplier), the schedule for communicating the forecasts (plans) and stock reports, agreements on planning horizons, location information etc.

The basic model for creating Integration Agreements is that the two trading partners review the supply chain and agree who carries out which elements when and how. The purpose of the review is to maximise overall supply chain efficiency and ensure savings accrue to both partners to justify the collaborative effort. This initial stage is vital to the success of the program between manufacturer and supplier.

There are many individual decisions that will be made within such an Integration Agreement but there are three decisions that make significant difference to how the supply chain is run:

1. Business scenarios:

   a. who initiates and manages the demand signals/purchasing process? Two basic models are Manufacturer driven (Traditional Order Management - TOM) and Supplier driven (Supplier Managed Inventory - SMI).

   b. when is the ownership of the goods transferred? Two basic models are Non-consignment and Consignment.

2. Financial Settlement: who initiates invoicing? Two basic models are Traditional Invoicing and Self-Billing.

   Today this would normally be the suppli-

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er (traditional Invoicing). In some cases the manufacturer would take on a self-billing process. Here the supplier does not raise invoices on the manufacturer but rather, based on agreed criteria, the manufacturer "raises invoices on themselves" and makes payment accordingly.

3. Data exchange: which elements are auTOMated through technology and how? Which messages will be sent when? Should the data to be exchanged follow an "exception approach" (i.e. responses generally are not required, only exceptions are communicated) vs. a "full confirmation approach" (required responses include the complete detail level)?

The implications of forming these new types of partnership between supplier and manufacturer are far reaching as they change the traditional way of doing business.

To fully leverage benefits of UIM, the two partners have to be knowledgeable in the use of supply chain processes such as defining and reading bar codes, e-commerce standards, and the IT systems that will be used to track and monitor goods in the supply chains.

Integration Agreement	Master Data Alignment	Purchase Conditions	Demand & Supply Signals	Despatch, Receipt & Consumption	Financial Settlement

4.2 Building Block 2: Master Data Alignment

Scope

The "Master Data Alignment" building block has three elements

1. Identifying and clarifying, between the two parties, the coding for items and locations.

2. Agreeing on the attributes to be shared about each item or location. e.g. such as specifications, logistical handling information, packaging format etc.

3. Ongoing alignment and synchronisation of the item, location and attribute data so that suppliers and manufacturers are working off a common and current understanding of this important base information. One challenge facing all trading relationships is maintaining accuracy and distribution of base item and location data given the rapid changes to specifications and logistics information that can arise.

Description

Downstream, with retailers, there is significant industry momentum behind implementing these three elements using **GS1** standards. The **UIM** supports this overall approach upstream. The three areas of **GS1** standards being used downstream are:

¤ Global Trade Identification Number (GTIN) and the Global Location identification Number (**GLN**) definitions. The **UIM** promotes that item and location coding should be implemented using these standards.

¤ The **Global Data Dictionary (GDD)** provides a globally agreed definition of the core attributes to be aligned. This approach should be reviewed by suppliers and manufacturers and copied where appropriate upstream.

¤ Global Data Synchronisation (GDS). This comprehensive standard process promoted by the **Consumer Goods Forum** and **GS1** allows a manufacturer to synchronise on a global basis to all interested or subscribing retailers, through an integrated system made up of data pools, global registry etc. Although the dynamics of data synchronisation needed are different upstream the **UIM** supports investigating the GDS approach and creating a version that is tuned to upstream needs.

Data accuracy and data base maintenance is a collective job concerning all the members of the Integrated Partnership (suppliers, manufacturers, and sometimes the logistic service providers). Moving to Master Data Alignment will typically require a substantial effort in data cleansing on the manufacturer's and supplier's part. Synchronising bad data on items and their attributes will not lead to real improvement.

Master Data Alignment

The data interchange for Master Data Alignment includes the item information messages. The manufacturer and supplier will commonly

agree on item information to be shared and drive the process of exchanging this data. Location information might not need to be exchanged as often as item information – therefore an electronic message for location information is not considered to provide significant benefit to the parties involved. For this reason location information should be exchanged and aligned via the Integration Agreement and it needs to be ensured that changes in location data are communicated in time between the parties involved. It is understood that the alignment of location data (i.e. GLN) plays a significant role even though an electronic message for aligning the location data is not considered in this report.

Item information will be composed of "General Item information" which is relationship-independent, and "Specific Item information" which is relationship-dependent item data.

The "General Item information" message should be limited to purely item related data such as item measurements, which is relation-ship-independent and thus can be exchanged with different parties.

The "Specific Item information" contains relationship-dependent item data, such as lead-times, stock levels etc. However, it is understood that this electronic message does not cover all the sections of an overall (mostly paper-based) Integration Agreement, but only those parts which might change often and therefore make sense to be exchanged electronically to ensure alignment between both parties while limiting manual effort.

The alignment on item master data through a "General Item Information" message and a "Specific Item Information" message can be realised as illustrated in the following process. While both parties need to agree on item master data, it is understood that only one party, i.e. manufacturer or supplier, will send the item information messages and that the information flow will be in one direction only in order to ensure synchronisation.
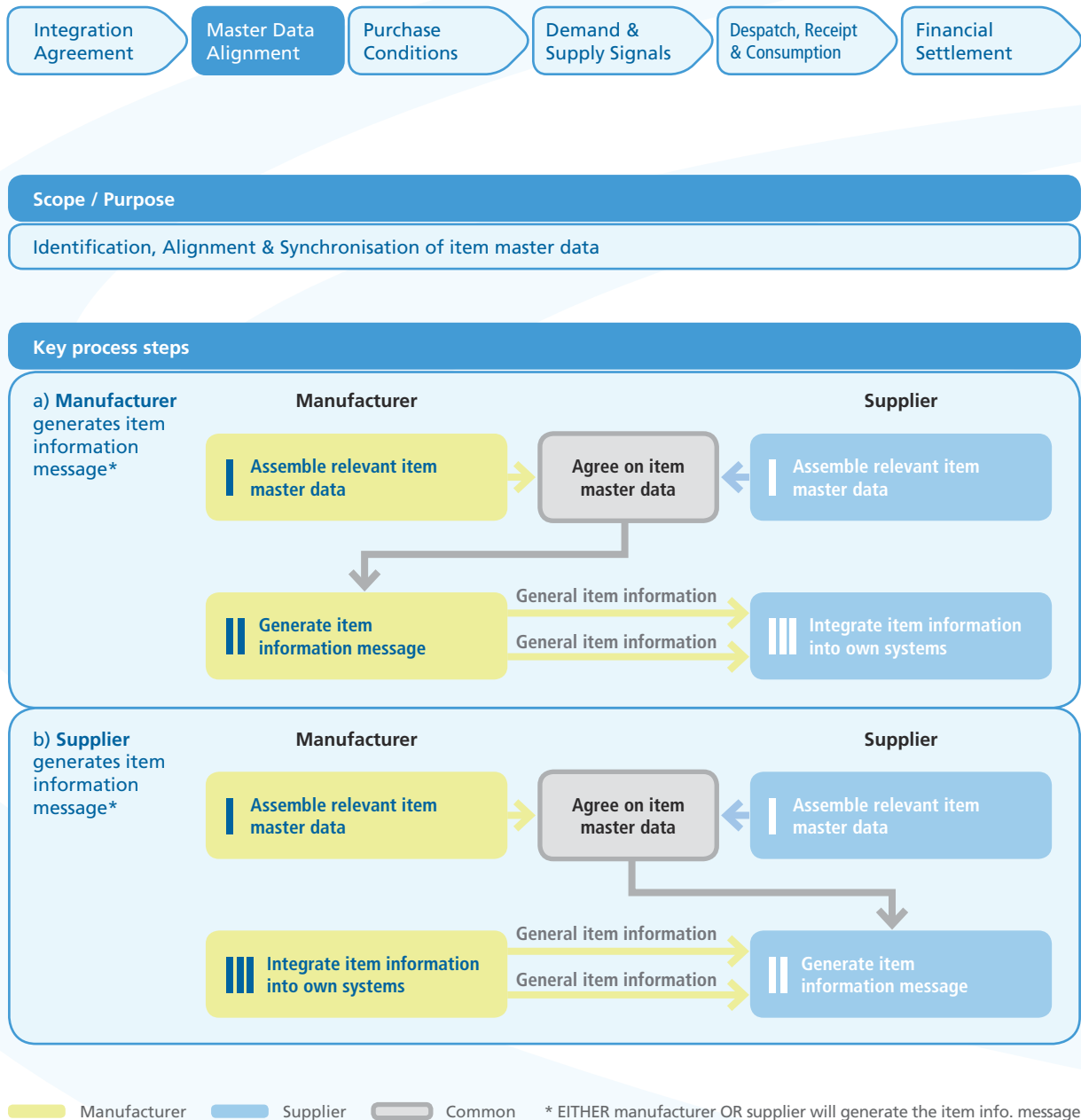
| Integration Agreement | Master Data Alignment | Purchase Conditions | Demand & Supply Signals | Despatch, Receipt & Consumption | Financial Settlement |

Scope / Purpose

Identification, Alignment & Synchronisation of item master data

Key process steps

Fig. 9. Data Alignment – Item information. *Source: GUSI working group*

I Generate relevant item master data. The manufacturer and supplier will both generate and agree the **general item information** such as item code, item description, item measurements etc. as well as the specific item information such as lead-times, stock levels, commitment levels, replacement items etc. Both parties might have parts of the required item information and need to ensure that all relevant data is provided by both parties in order to assemble the complete item information. After having assembled the relevant information, both parties must agree on the item information.

II Generate item information message. Either the manufacturer (Figure 6, scenario a) or the supplier (Figure 6, scenario b) will generate the item information messages (known as Item Data Notification) with the agreed item master data and send it to the other party. Who sends the item information message should be agreed upon in the Integration Agreement.

III Integrate item information. The party receiving the Item Data Notification message (as well as the sending party) will make sure that the information is then stored in their own systems in order to ensure data alignment.

General Item Information

- **Purpose:** the general item information message allows the identification and clarification of general (i.e. relationship-independent) item coding between trading partners, the agreement on the attributes to be shared about each item as well as the alignment and synchronisation of item information between trading partners. Item Master Data is a set of data which describes the specifications and structures of each item involved in supply chain processes. Each set of data can be uniquely identified by a Global Trade Item Number (GTIN). Data covered in the item master data will overrule similar data (e.g. unit of measure) in other messages; data covered in the item master data therefore does not need to be filled in other messages

- **Responsible party:** the message can be established by the manufacturer and/or the supplier. Only one party will send the messages, and which of both parties sends the message needs to be agreed upon in the Integration Agreement. Changes in item master data need to be commonly agreed and realised by the party initially sending the message, i.e. message flow will only be in one direction in order to ensure synchronisation.

- **Benefits:** the message can generate following benefits:
  - ¤ Reduced mismatches, more accurate business transactions and therefore reinforced efficiency of the supply chain operations

- **Timing:**
  - ¤ the manufacturer and the supplier must make contact and set up a business relationship before trade can proceed. Following the establishment of the integration agreement the parties will exchange their basic business data such as general item information
  - ¤ master data will be aligned each time information changes or new information is added
  - ¤ **Response:** no specific response is required

Specific Item information

- **Purpose:** the specific item information message allows the identification and clarification of relationship-specific item coding between trading partners, the agreement on the attributes to be shared about each item as well as the alignment and synchronisation of item information between trading partners. The message will contain those relationship-specific item related parts of the overall (and mostly paper-based) Integration Agreement, which might change often and therefore make sense to be exchanged electronically to ensure alignment between both parties while limiting manual effort.

- **Responsible party:** the message can be established by the manufacturer and/or the supplier. Only one party will send the messages, and which of both parties sends the message needs to be agreed upon in the Integration Agreement. Changes in item master data need to be commonly agreed and realised by the party initially sending the message, i.e. message flow will only be in one direction in order to ensure synchronisation.

- **Benefits:**

  - ¤ reduced mismatches, more accurate business transactions and therefore reinforced efficiency of the supply chain operations

- **Timing:**

  - ¤ the manufacturer and the supplier must make contact and set up a business relationship before trade can proceed. Following the establishment of the Integration Agreement the parties will exchange their basic business data such as specific item information

  - ¤ master data will be aligned each time information changes or new information is added

- **Response:** no specific response is required.

Integration Agreement | Data Alignment | **Purchase Conditions** | Demand & Supply Signals | Despatch, Receipt & Consumption | Financial Settlement

4.3 Building Block 3: Purchase Conditions

Scope

The "Purchase Conditions" building block has two purposes:

1 It expresses the official commitment between supplier and manufacturer that certain quantities are to be delivered over a given period and at the stated price. In doing so it sets the contractual conditions for the ordering and delivering of the goods and so details specific terms and conditions that apply for a given period. The Purchase conditions can include different scenarios:

• Fixed quantity and fixed period
• Fixed quantity and variable period
• Variable quantity and fixed period

2 It provides a valid transaction checklist that contains the basic information to ensure that an order or invoice can be validated automatically.

Description

The Purchase Conditions does not intend to contain the totality of the contractual information, but to provide the relevant data in order to be able to align key conditions in an automated way.

The alignment on Purchase Conditions data through a "Purchase Conditions" message can be realised as illustrated in the following process. While both parties need to agree on Purchase Conditions data, it is understood that only one party (i.e. manufacturer or supplier) will send the Purchase Conditions message and that the information flow will be in one direction only in order to ensure synchronisation.

Scope / Purpose

Contractual agreement for the purchase on a certain quantity, over a certain period of time, at a certain price

Key process steps

a) Manufacturer generates Purchase Conditions message*

Manufacturer — Assemble relevant Purchase Conditions data → Agree on Purchase Conditions data ← Assemble relevant Purchase Conditions data — Supplier

Generate Purchase Conditions message — *Purchase Conditions* → Integrate Purchase Conditions information into own systems

b) Supplier generates Purchase Conditions message*

Manufacturer — Assemble relevant Purchase Conditions data → Agree on Purchase Conditions data ← Assemble relevant item master data — Supplier

Integrate Purchase Conditions information into own systems ← *Purchase Conditions* — Generate item information message

Manufacturer   Supplier   Common   * EITHER manufacturer OR supplier will generate the Pur. Cond. message
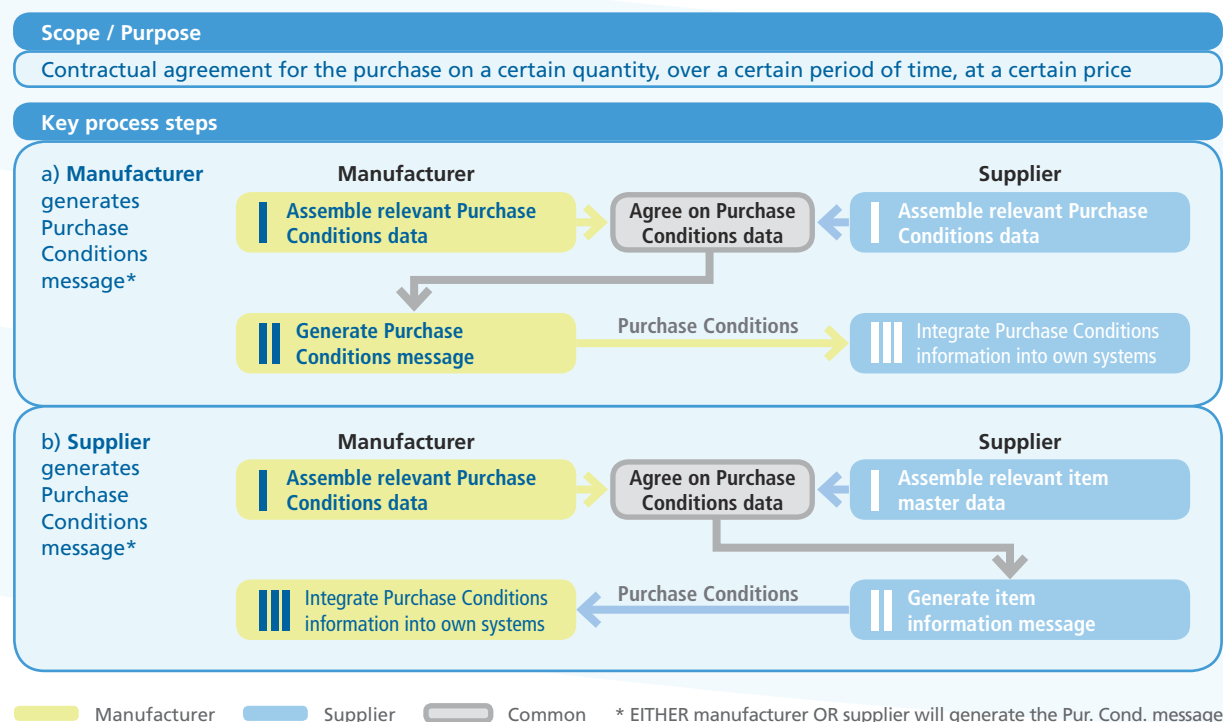
Fig. 10. **Purchase Conditions.** *Source: GUSI working group*

I Generate relevant Purchase Conditions data. The manufacturer and supplier will both generate and agree the relevant Purchase Conditions data such as item price, price brackets, payment terms, etc. Both parties might have parts of the required Purchase Conditions information and need to ensure that all relevant data is provided by both parties in order to assemble the complete Purchase Conditions information. After having assembled the relevant information, both parties must agree on the Purchase Conditions information.

II Generate Purchase Conditions message. Either the manufacturer (Figure 7, scenario a) or the supplier (Figure 7, scenario b) will generate the Purchase Conditions message with the agreed Purchase Conditions data and send it to the other party. Who sends the Purchase Conditions message should be agreed upon in the Integration Agreement.

III Integrate Purchase Conditions information. The party receiving the Purchase Conditions message (as well as the sending party) will make sure that the information is then stored in their own systems in order to ensure data alignment.

Purchase Conditions

- **Purpose:** Purchase Conditions will be established as a subset of an overall purchase contract and cover the basic conditions needed to automatically approve the transmission of an order or the correctness of an invoice. It forms the contractual agreement for the purchase on a certain quantity, over a certain period of time, at a certain price. It does not intent to contain the totality of the contractual information.

- **Responsible party:** 2-way process, i.e. it can be established/triggered by both manufacturer and supplier. Only one party will send the messages, and which party sends the message needs to be agreed upon in the Integration Agreement. Changes in Purchase Conditions need to be commonly agreed and realised by the party initially sending the message, i.e. message flow will only be in one direction in order to ensure synchronisation.

- **Benefits:**

  - alignment of key business principles and conditions (price, quantity, etc.) between trading partners and alignment with payment process

  - enabling automatic approval and transmission of orders and invoices

- **Timing:** the Purchase Conditions will be established after having agreed on an overall purchase contract and before ordering and delivering the goods

- **Response:** no specific response is required.

| Integration Agreement | Data Alignment | Purchase Conditions | Demand & Supply Signals | Despatch, Receipt & Consumption | Financial Settlement |

4.4 Building Block 4: Demand & Supply Signals

Scope

In the "Demand & Supply Signals" building block specific delivery quantities and timings are established based on the material requirements of a manufacturer.

Description

The trading partners must agree a process to ensure delivery of material by the supplier to meet the production needs of the manufacturer.
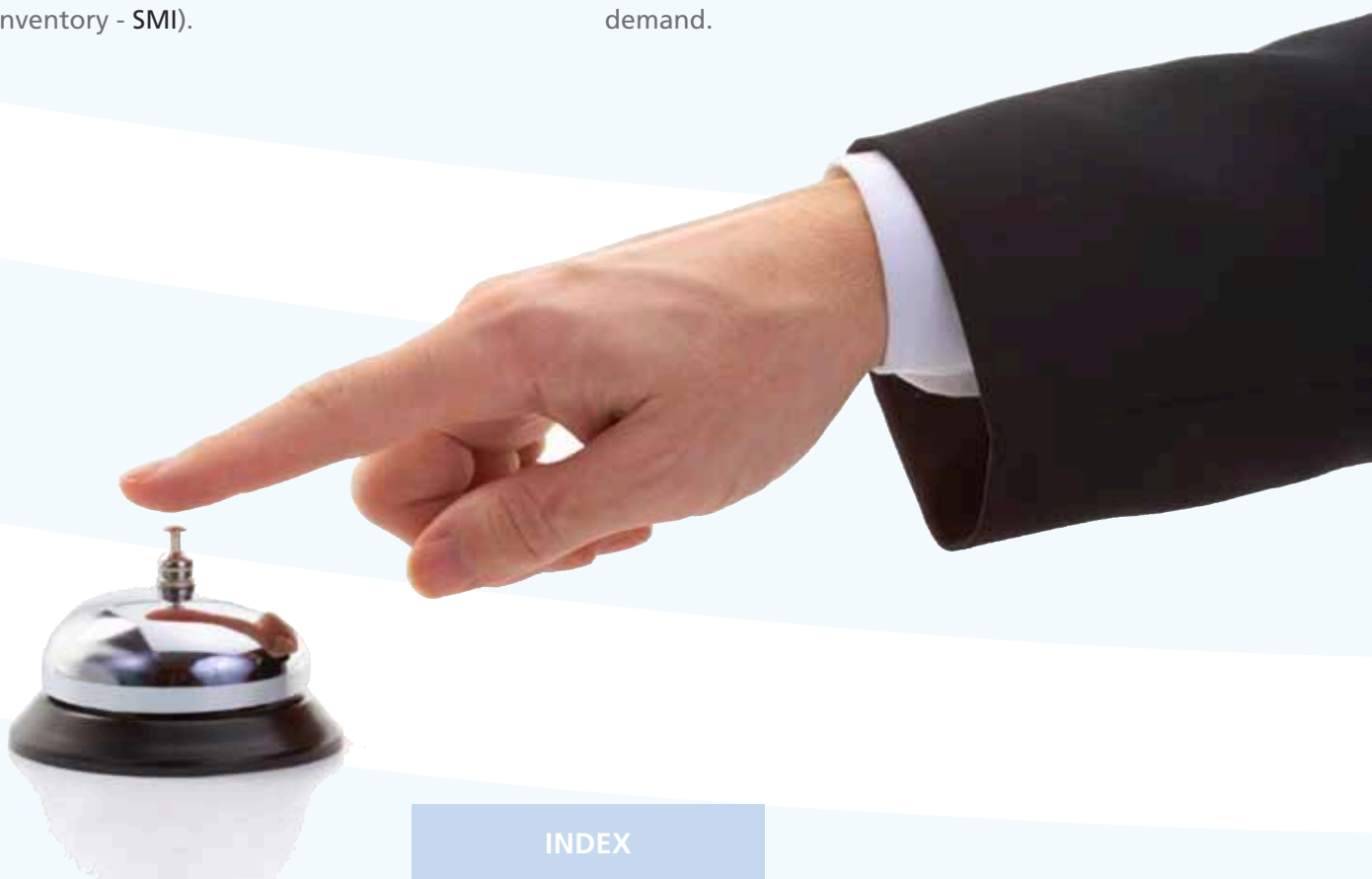
There are two basic scenarios relevant in exchanging demand and supply signals - Manufacturer Driven (Traditional Order Management - **TOM**) and Supplier driven (Supplier Managed Inventory - **SMI**).

Basic demand & supply signal scenarios

Manufacturer Driven scenario (Traditional Order Management - TOM):

In this scenario the manufacturer undertakes the internal calculations of his material requirements and communicates his requirements with specific quantities and timings to the supplier. The manufacturer can communicate his requirements through sending a purchase order (Scenario A) or his net requirements (Scenario B) to the supplier.

Both Traditional Order Management scenarios, i.e. communication of demand through purchase order and communication of demand through net requirements are currently used and thus will be illustrated below. The supplier can confirm his ability to supply by sending an Order Response when a Multi Shipment Order (purchase order) has been sent or a Goods Requirements Response (net requirements confirmation) when Goods Requirements (net requirements) have been sent to communicate demand.
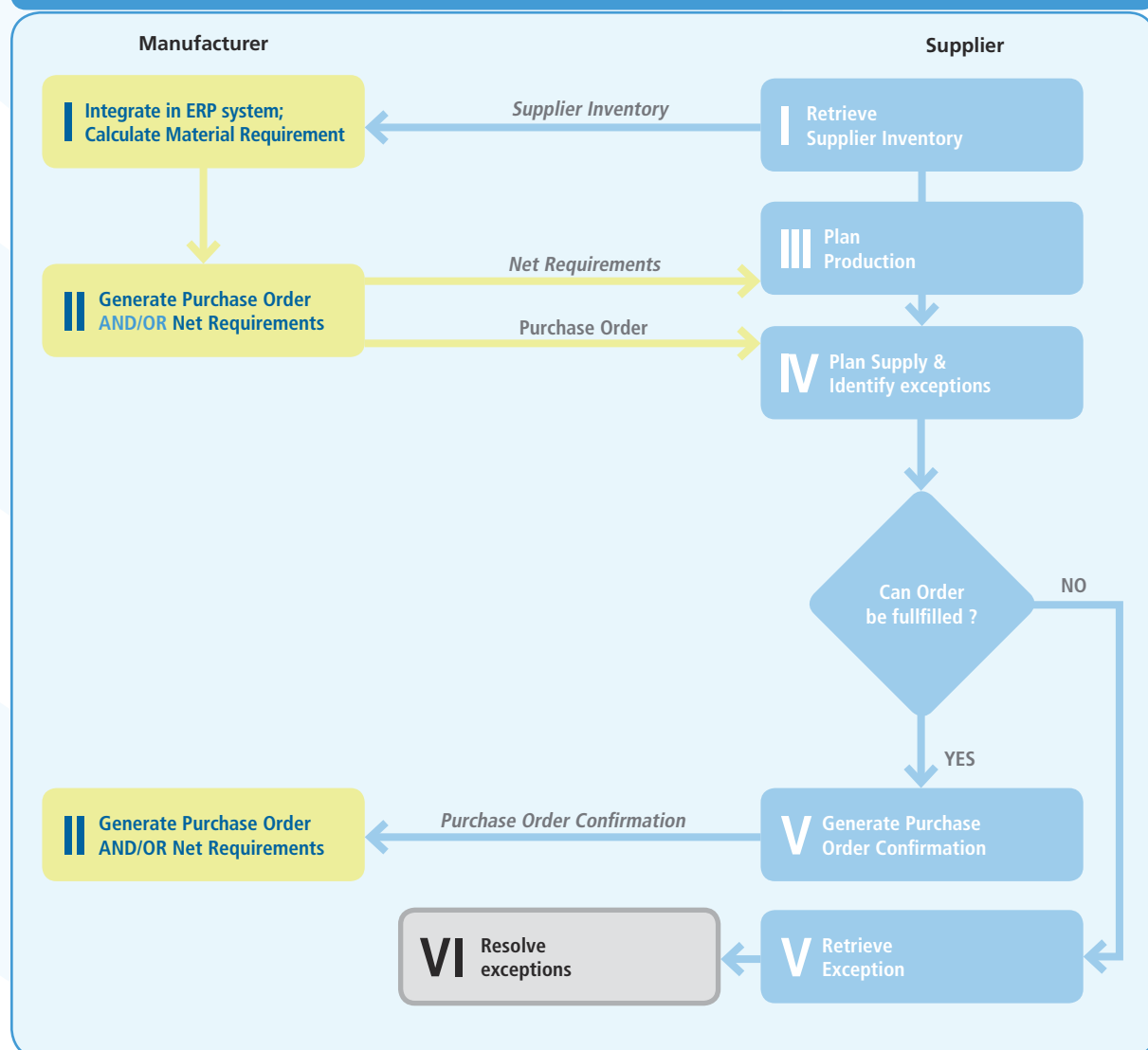
| Integration Agreement | Data Alignment | Purchase Conditions | Demand & Supply Signals | Despatch, Receipt & Consumption | Financial Settlement |

Scenario A:

Manufacturer sends purchase orders (and optionally net requirements in addition). **Key elements of this scenario are as follows:**

Scope / Purpose

Communicate specific delivery quantities and timings based on the material requirements of the manufacturer

Key process steps Scenario A

Manufacturer — **Supplier**

- I Integrate in ERP system; Calculate Material Requirement ← *Supplier Inventory* ← I Retrieve Supplier Inventory
- II Generate Purchase Order AND/OR Net Requirements — *Net Requirements* → III Plan Production
- *Purchase Order* → IV Plan Supply & Identify exceptions

Can Order be fullfilled ? — NO / YES

- II Generate Purchase Order AND/OR Net Requirements ← *Purchase Order Confirmation* ← V Generate Purchase Order Confirmation
- VI Resolve exceptions ← V Retrieve Exception

Legend:
- Manufacturer (yellow)
- Supplier (blue)
- Common (grey)
- *Italic* ➔ Optional

Fig. 11. Demand & Supply Signals TOM scenario A. *Source: GUSI working group*

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I Supplier inventory information. The supplier retrieves supplier inventory information (also see Inventory Activity/Inventory Status message) and sends this information to the manufacturer; this process step applies mainly to manufacturer-specific inventory and is optional. It can be relevant when the manufacturer plans promotions and needs to integrate the inventory available at the supplier into his planning.

If consignment stock is used in a TOM business scenario, the manufacturer could send the manufacturer inventory to the supplier in order to provide him with additional information related to management of consignment goods.

I Manufacturer demand calculation. The manufacturer calculates own demand (either with or without integration of supplier inventory information) and generates manufacturer material requirements.

II Manufacturer Purchase Order Generation. The manufacturer generates his material requirements and derives from that the purchase order (also see Multi Shipment Order message) specifying material, quantities, locations, delivery dates and times, etc. to the supplier.

In addition to the Multi Shipment Order message, the manufacturer can also send a Goods Requirements (net requirements) message (defined as gross requirements minus Inventory) optional in TOM scenario A, also see Goods Requirements message) beforehand. This applies in a scenario where the manufacturer wants to communicate his net requirements associated to different commitment levels (commitment for delivery, commitment for production, for information) as defined in the item information data beforehand to the supplier, so that the supplier can better plan his production and to ensure material availability for the manu-

facturer. Which messages will be sent should be fixed in an Integration Agreement.

III Supplier production planning. If the manufacturer only sends a Multi Shipment Order (and no Goods Requirements message), the supplier can plan his own production based on the Multi Shipment Order. Otherwise the supplier can use the net requirements to plan his production.

IV Supplier supply planning. The supplier will then plan his supply based on the Multi Shipment Order message received from the manufacturer

V Generation of confirmation message. The supplier can send a purchase order confirmation (optional, see Order Response message) if the order can be supplied as requested. This message is optional and its usage needs to be defined in an Integration Agreement.

If the order cannot be supplied as requested, the supplier will communicate the exceptions as agreed in the Integration Agreement to the manufacturer. Both parties will then commonly resolve the exceptions. If the manufacturer and supplier agree on a change in the purchase order, the manufacturer will send a new Multi Shipment Order message marked as "changed" through the status/change indicator to the supplier and thus communicate the newly agreed information, which will then be confirmed by the supplier through the Order Response message.

VI Integration of order confirmation. The manufacturer can integrate the information about the confirmed order in his ERP system after a common resolution has been agreed upon.

| Integration Agreement | Data Alignment | Purchase Conditions | Demand & Supply Signals | Despatch, Receipt & Consumption | Financial Settlement |

Scenario B:

Manufacturer sends net requirements (and optionally purchase orders in addition). **Key elements of this scenario are as follows:**

Scope / Purpose

Communicate specific delivery quantities and timings based on the material requirements of the manufacturer

Key process steps Scenario B
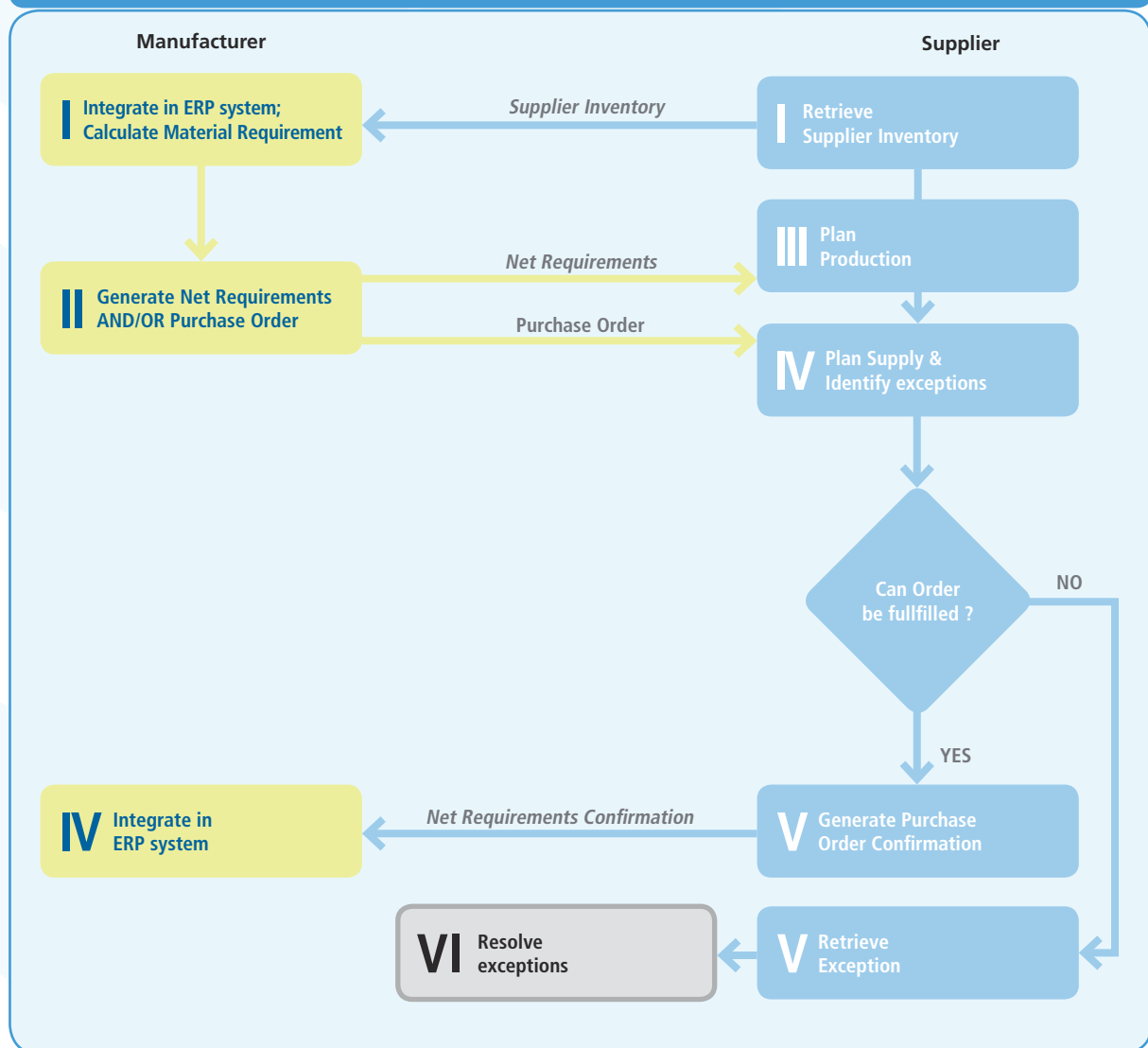
Fig. 12. Demand & Supply Signals TOM scenario A. *Source: GUSI working group*

I Supplier inventory information. The supplier retrieves supplier inventory information (also see Inventory Activity/Inventory Status message) and sends this information to the manufacturer; this process step applies mainly to manufacturer-specific inventory and is optional. It can be relevant when the manufacturer plans promotions and needs to integrate the inventory available at the supplier into his planning.

If consignment is used in a TOM business scenario, the manufacturer could send the manufacturer inventory to the supplier in order to provide him with additional information related to management of consignment goods.

I Manufacturer demand calculation. The manufacturer calculates his own demand (either with or without the integration of the supplier's inventory information) and generates manufacturer material requirements

II Manufacturer Net Requirements calculation. The manufacturer generates his net requirements (defined as gross requirements minus inventory) and sends the Goods Requirements message (also see Goods Requirements message) specifying material, quantities, locations, timings, etc. to the supplier.

In addition to the Goods Requirements message, the manufacturer can also send a purchase order (optional in TOM scenario B, also see Multi Shipment Order message) later in the process, specifying concrete delivery dates and times. Which messages will be sent should be fixed in an Integration Agreement.

III Supplier production planning. The supplier will plan his own production based on the net requirements received from the manufacturer.

IV Supplier supply planning. The supplier will then plan his supply. If only net requirements are sent by the manufacturer, he will base his

planned supply on the Goods Requirements message. If an additional purchase order is send by the manufacturer, the supplier can base his planned supply on the Multi Shipment Order message.

V Generation of confirmation message. The supplier can send a net requirements confirmation (optional, see Goods Requirements Response message) in order to confirm the Goods Requirements message. This message is optional and its usage needs to be defined in an Integration Agreement.

If the order cannot be supplied as requested, the supplier will communicate (as agreed in the Integration Agreement) the exceptions to the manufacturer. Both parties will then commonly resolve the exceptions. If manufacturer and supplier agree on a change in the net requirements, the manufacturer will send a new Goods Requirement message marked as "changed" through the status/change indicator to the supplier and thus communicate the newly agreed information, which will then be confirmed by the supplier through the Goods Requirements Response message.

VI Integration of order confirmation. The manufacturer can integrate the information about the confirmed order in his ERP system after a common resolution has been agreed on.

Supplier driven scenario (Supplier Managed Inventory - SMI):

In this scenario the supplier is committed to calculating the order size and planned delivery timings, using the information on Inventory and Material Requirements received from the manufacturer together with information from his own operations. These responsibilities are laid down in the Integration Agreement where other items such as minimum and maximum stock holdings are defined.

To do this the supplier must receive the relevant data to enable him to work out the stock equation. The variables that are required for the calculation include stock in transit, stock at the manufacturer and stock in own warehouses, any other inventory in the supply chain plus the commonly agreed inventory window.

The supplier then might combine this with the material forecast from the manufacturer to calculate the actual demand of components or materials and based on his own internal production etc. the dates when they will be delivered. The resulting information is provided to the manufacturer, e.g. in form of a delivery plan.

Key elements of this scenario are as follows:

Integration Agreement → Data Alignment → Purchase Conditions → **Demand & Supply Signals** → Despatch, Receipt & Consumption → Financial Settlement

Scope / Purpose

Communicate specific delivery quantities and timings based on the material requirements of a manufacturer
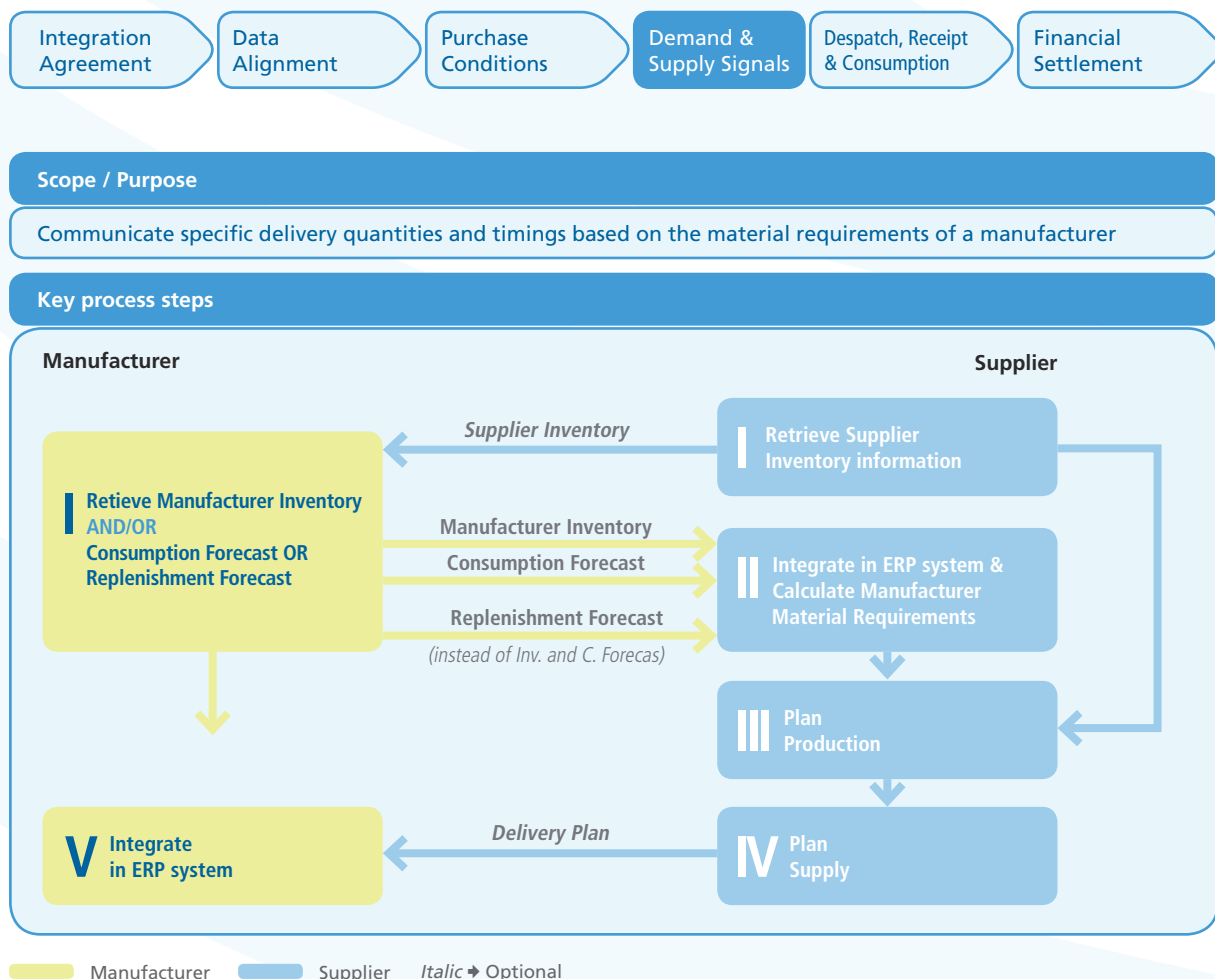
Key process steps

Fig. 13. Demand & Supply Signals SMI scenario. *Source: GUSI working group*

I Supplier inventory information. The supplier retrieves supplier inventory information (also see Inventory Activity/Inventory Status message) and sends this information to the manufacturer; this process step applies mainly to manufacturer specific inventory and is optional. It can be relevant when the manufacturer plans promotions and needs to integrate the inventory available at the supplier into his planning.

I Manufacturer requirements information. The manufacturer retrieves his own inventory information and his material consumption forecast. The manufacturer will then send:

- the manufacturer inventory information (also see Inventory Activity/Inventory Status message) and the consumption forecast (also see Goods Requirements message) in two separate messages (e.g. in order to allow to the supplier to calculate material requirements and to plan his own production and replenishment accordingly) OR

- the replenishment forecast (also see Replenishment Request message), consisting of inventory information and consumption forecast in one single message. The merger of inventory information and consumption forecast might be applied in a more advance data interchange generation system

Which messages will be sent should be fixed in an Integration Agreement and depends on the type of information necessary to be exchanged. The Inventory Activity/Inventory Status message and the Goods Requirements (consumption forecast) messages need to be synchronised in order to provide consistent data (in particular regarding the time of information extraction from the company systems). In some cases, it might also make sense to only send the inventory information (e.g. in case of silo

refills, usage of KANBAN systems, etc. where only the manufacturer inventory information is required) or only the consumption forecast data (e.g. in case no inventory is existing and thus not relevant).

II Manufacturer requirements calculation. The supplier will use the manufacturer inventory information and consumption forecast information to calculate the manufacturer material requirements.

III Supplier production planning. The supplier will use this information together with his own inventory information to plan his own production.

IV Supplier supply planning. The supplier will then plan his supply and can inform the manufacturer about the planned deliveries through sending the Delivery Plan (also see Replenishment Proposal message). This message is optional and its usage needs to be agreed upon in the Integration Agreement.

Demand & Supply Signals

Net requirements data

- **Purpose:** the Goods Requirements message will communicate at prescribed intervals the net requirements (defined as gross requirements minus inventory) for given location(s) and/or material(s) for a specific time interval to enable production planning at the supplier

- **Responsible party:** the message will be sent by the manufacturer

- **Benefits:** The message can generate following benefits:

¤ net requirements information allows the supplier to plan his own production and replenishment

¤ ensures material availability at the manufacturer

¤ aligned expectations: items, quantities, shipment locations and timelines

• **Timing:** the message will be triggered by the agreed upon date and time for sending the net requirements (based on the Integration Agreement) and is applicable in TOM business scenarios

• **Response:** a Goods Requirements Response message can be issued as the required response (optional), if this has been agreed in the Integration Agreement.

Net requirements confirmation

• **Purpose:** through the Goods Requirements Response message, the supplier confirms that the net requirements have been received and can be fulfilled

• **Responsible Party:** the Goods Requirements Response is sent by the supplier

• **Benefits:** The message allows to achieve following benefits:

¤ manufacturer side: validation of net requirements – confirmation of material availability at time of production

¤ supplier side: alignment with the manufacturer's expectations

• **Timing:** the Goods Requirements response message can be sent after having received the net requirements; the message is optional and its usage should have been agreed upon in the Integration Agreement. It is applicable in TOM business scenarios.

• **Response:** the message requires no response from the manufacturer.

Purchase order data

- **Purpose:** through the Multi Shipment Order message, the manufacturer orders specified quantities of material(s) from a supplier for given location(s) for a specific delivery date/time and thus ensures contractual commitment.

- **Responsible Party:** the Multi Shipment Order message is sent by the manufacturer

- Benefits: the message allows to achieve following benefits:

    ¤ purchase order information allows the supplier to plan his own production and replenishment

    ¤ ensures material availability at the manufacturer

    ¤ aligned expectations in terms of items, quantities, shipment locations and timelines

- **Timing:** the Multi Shipment Order message can be triggered for every new or changed order of material(s) to given location(s) and is applicable in TOM business scenarios

- **Response:** an Order Response message can be issued as required. The response is optional, if this has been agreed in the Integration Agreement.

Purchase order response

- Purpose: through the Order Response message, the supplier confirms that the purchase order has been received and can be fulfilled

- Responsible Party: the Order Response message is sent by the supplier

- Benefits: the message allows to achieve following benefits:

    ¤ manufacturer side: validation of the purchase order – confirmation of material availability at time of production

    ¤ supplier side: alignment with the manufacturer's expectations

- **Timing:** the Order Response message can be sent after having received the purchase order; the message is optional and its usage should have been agreed upon in the Integration Agreement. It is applicable in TOM business scenarios.

- **Response:** the message requires no response from the manufacturer.

Inventory Activity/Inventory Status message

- **Purpose:** the Inventory Activity/Inventory Status message communicates at prescribed intervals the inventory levels of trade items in a specific location (plant, warehouse) to enable material requirements planning; it should cover all active items, i.e. items which have been marked as "active" in the item information message (see item information message)

- **Responsible Party:** the manufacturer is responsible for sending the buyer inventory message, and the supplier is responsible for sending supplier inventory message

- **Benefits:**

    ¤ information on buyer inventory enables the supplier to calculate material requirements and plan his own production and raw materials accordingly. Information can result in higher material availability at the buyer (i.e. less unplanned changeovers, etc.)

¤ information on supplier inventory (i.e. buyer-specific inventory) allows the buyer to better plan his own production (e.g. in case of sudden changes in demand, promotions, etc.)

¤ both parties can potentially lower inventories (safety stock, write-off) due to more transparency on inventories

• **Timing:** the message is triggered by the agreed upon date and time for sending the inventory status (based on the Integration Agreement). The buyer inventory message is optional in a TOM and required in a SMI scenario (either as separate message or integrated in the Replenishment Request message), the supplier inventory message is optional in both, TOM and SMI scenarios (incl. consignment scenarios)

• **Response:** no response to this message is required by either party.

Consumption Forecast data

• **Purpose:** the Goods Requirements message is sent by the manufacturer and communicates at prescribed intervals the forecast for material consumption for given location(s) and/or material(s) for a specific time interval to enable production and replenishment planning through the supplier; the figures communicated represent the gross requirements of the manufacturer

• **Responsible Party:** the Goods Requirements message is sent by the manufacturer

• **Benefits:**

¤ information on buyer material consumption allows the supplier to plan his production and raw materials and to calculate re-plenishment

¤ enables continuous replenishment and ensure material availability at the manufacturer

• **Timing:** the message is triggered by the agreed upon date and time for sending the Goods Requirements (based on Integration Agreement) and is applicable in SMI scenarios (incl. consignment scenarios)

Response: the Replenishment Proposal message (delivery plan) can be requested as the response to the Goods Requirements message (optional)

Replenishment Request message

• **Purpose:** this message is sent by the buyer to communicate to the supplier at prescribed intervals the inventory levels of trade items in a specific location as well as material consumption for given location(s) and/or material(s) for a specific time interval to enable material requirements planning and production planning at the supplier; it should cover all active items, i.e. items which have been marked as "active" in the item information message (see item information message)

• **Responsible Party:** the Replenishment Request message is sent by the buyer

• **Benefits:**

¤ combination of inventory and consumption forecast data eliminates an information flow without added value and reduction of information flow related costs

¤ information on the buyer inventory enables the supplier to calculate material requirements and plan his own production and raw materials accordingly. The information can result in higher material availability at buyer (i.e. less unplanned changeovers, etc.)

¤ information on the buyer material consumption allows the supplier to plan his own production, enables continuous replenishment and ensures material availability at the manufacturer

¤ both parties can potentially lower inventories (safety stock, write-off) due to more transparency on inventories

- **Timing:** the message is triggered by the agreed upon date and time for sending the Replenishment Request (based on the Integration Agreement) and is applicable in SMI scenarios (incl. consignment scenarios, i.e. SMOI)

- **Response:** the Replenishment Proposal message can be requested as response to the Replenishment Request (optional)

Delivery Plan data

- **Purpose:** the Replenishment Proposal is sent by the supplier and communicates to the buyer the quantities of which items will be delivered when and where by the supplier

- **Responsible Party:** the Replenishment Proposal is sent by the supplier

- **Benefits:**

¤ manufacturer side: planning of receiving logistics (warehousing, quality control, etc.), ability to change production plan on short lead-times

¤ supplier side: creation of a valid document fixing quantity, locations, timing, etc. which might also be required for internal regulations and systems

- **Timing:** the supplier will send a Replenishment Proposal (based on the Integration Agreement) to the buyer after every planned supply before despatching the goods and as response to the Goods Requirements/Replenishment Proposal received from the buyer (optional). This message is applicable in SMI scenarios (incl. consignment scenarios, i.e. SMOI)

- **Response:** no response to this message is required.
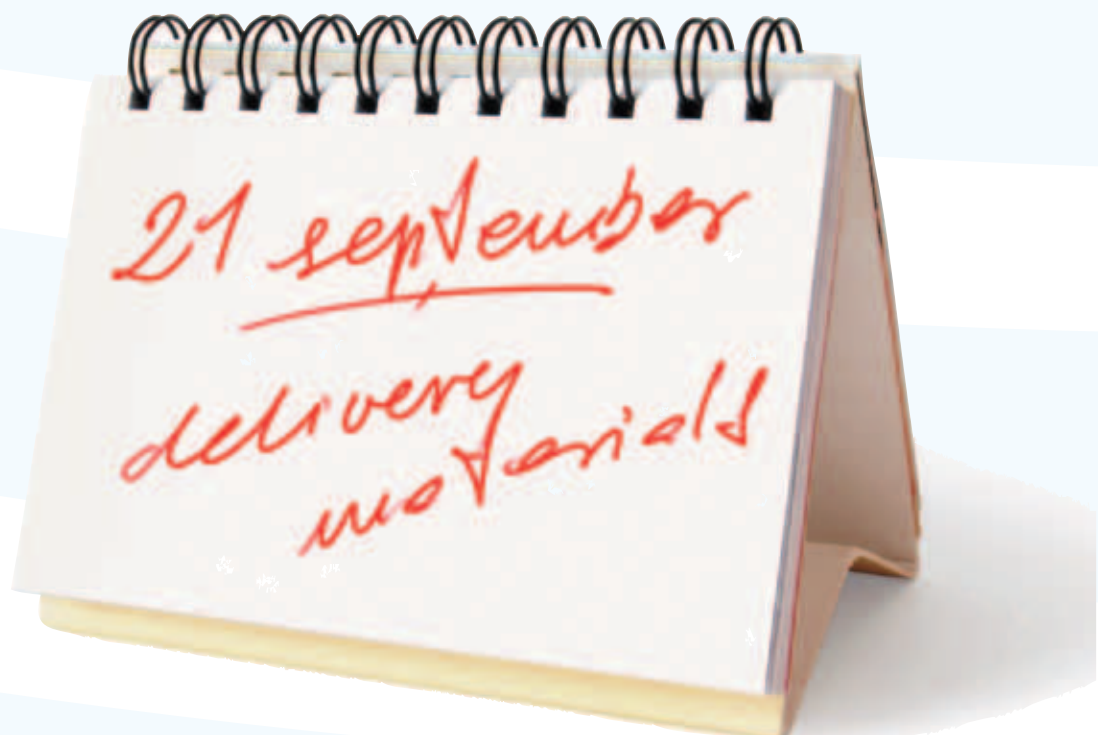
Integration Agreement	Data Alignment	Purchase Conditions	Demand & Supply Signals	Despatch, Receipt & Consumption	Financial Settlement

4.5 Building Block 5: Despatch, Receipt & Consumption

Scope

This building block covers the execution of goods despatch at the supplier site as well as the Receipt Notification and goods consumption at the manufacturer site.

Description

Two key business scenarios have been identified regarding the exchange of despatch, receipt and consumption messages: 1) TOM & SMI without consignment and 2) TOM & SMI with consignment, i.e. SMOI.

In the case of non-consignment goods the supplier does not need to be informed about the manufacturer's consumption.

In the case of consignment goods, the transfer

Scope / Purpose

Despatch and transport goods to the manufacturer's site, receive goods & consumption
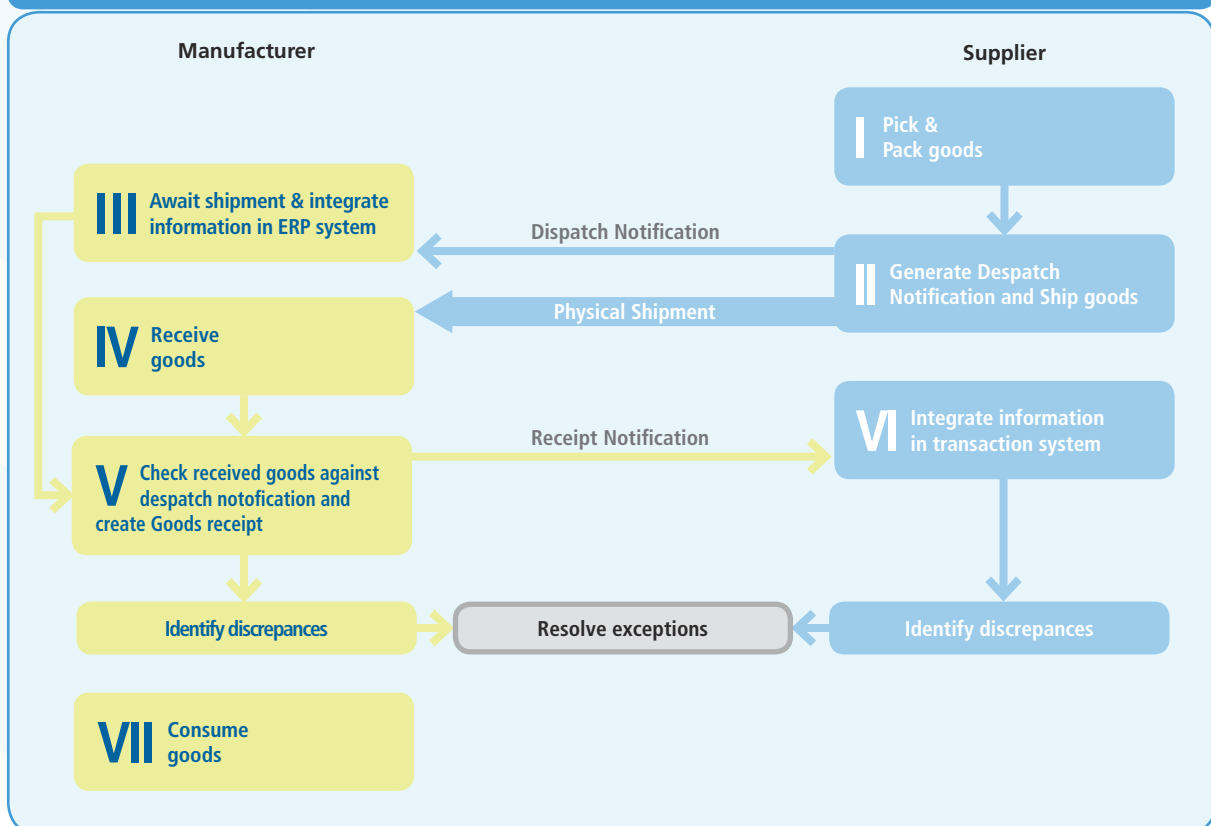
Key process steps

Fig. 14. Demand , Receipt & Consumption TOM & SMI without consignment. *Source: GUSI working group*

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of ownership from the supplier to the manufacturer will take place when goods will be consumed by the manufacturer. As invoicing will also be linked to the consumption of the goods, the supplier needs to be informed about the manufacturer's consumption.

TOM & SMI
without consignment

I Pick and pack goods. The supplier will pick and pack the goods in order to be able to despatch the goods.

II Generate despatch notification. The supplier will generate and send the Despatch Advice at the point of time of sending the goods to the manufacturer, the goods being sent being considered as in transit.

III Receipt of despatch notification. The manufacturer will receive the Despatch Advice and await the shipment of the goods. The manufacturer may integrate the information of the Despatch Advice into his ERP system. Having received notification of the goods being despatched, the IT system at the manufacturer's site will be ready to receive the goods and ready to read the Serial Shipping Container Code (SSCC) on the logistic unit (if applicable).

IV Receipt of goods. The manufacturer will then receive the goods shipped by the supplier or a third party service provider. The reading of the Serial Shipping Container Code (SSCC) on the logistic unit will confirm that these goods have arrived (if applicable).

V Generate receipt notification. The manufacturer will check the received goods against the Despatch Advice and identify any discrepancies. The material handler at the manufacturer site will then post the receipt notification in his ERP system thus updating the current stock on hand and its status. The actual posting of the receipt

notification in the ERP system will trigger the Receiving Advice message to be sent to the supplier. At the same time, the inventory situation and status should be updated on both sites e.g. through having the manufacturer sending the new inventory information to the supplier. The Receiving Advice message will delete the stock in transit and the inventory message will reflect the updated inventory information.

Good receipts are based on the highest level of packaging for which a GS1 code is available. The packaging unit is as identified in the despatch notification and must be labelled according to GS1 logistics label standards (see EAN International report, Supply Chain Management Tools for the Packaging Industry, published in February 2000, pages 18 – 24).

VI Integrate receipt notification information in transaction system. The supplier will receive the Receiving Advice message, identify any discrepancies and may integrate the information contained into his own transaction system.

Any discrepancies identified either on manufacturer or supplier site should be resolved through communicating the discrepancies in the Receiving Advice message and/or in offline conversations.

VII Consumption of Goods. The manufacturer will consume the goods received from the supplier.

| Integration Agreement | Data Alignment | Purchase Conditions | Demand & Supply Signals | Despatch, Receipt & Consumption | Financial Settlement |

Scope / Purpose

Despatch and transport goods to the manufacturer's site, receive goods & consumption

Key process steps
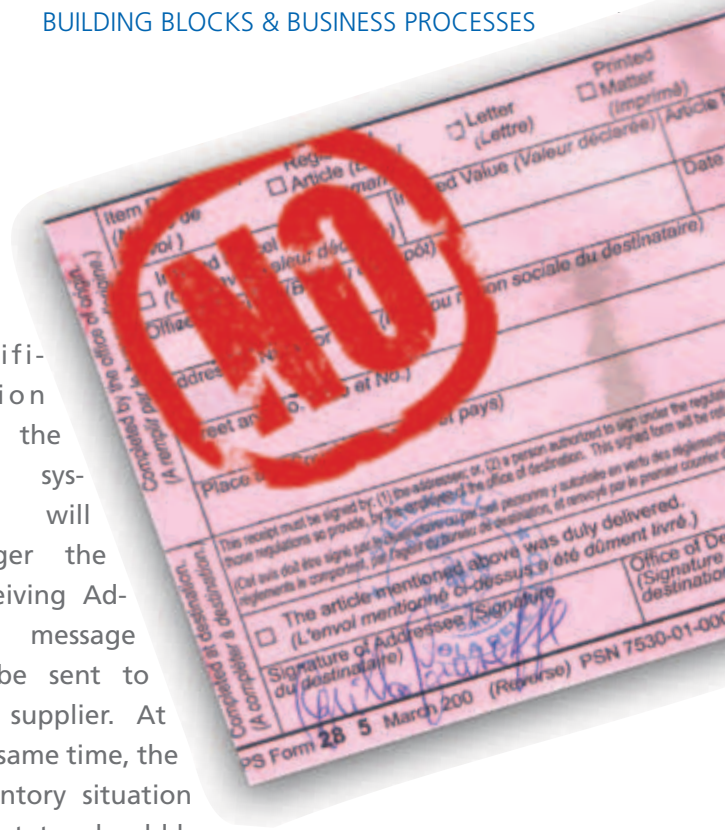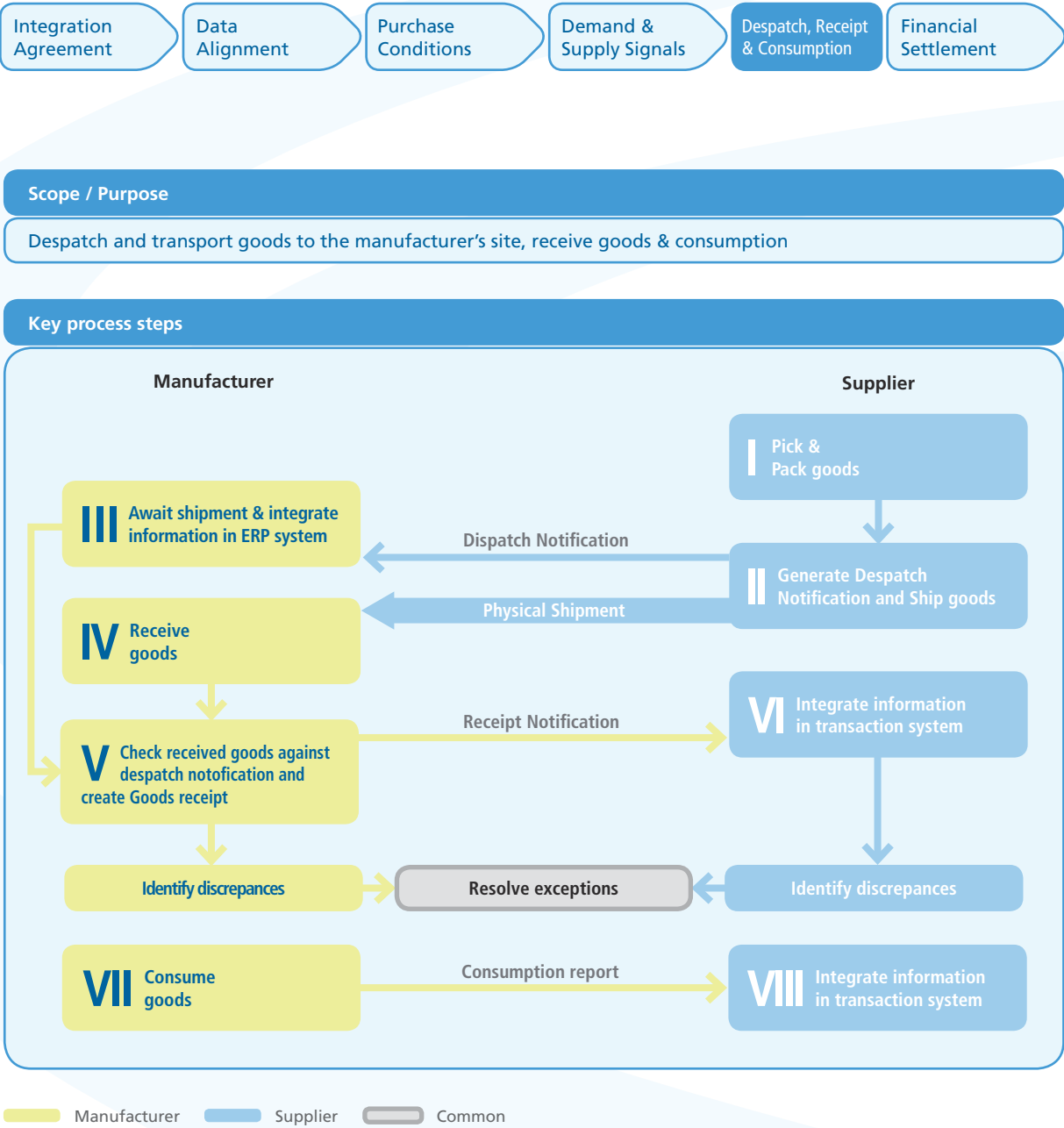
Fig. 15. Despatch, Receipt & Consumption TOM with consignment & SMOI. *Source: GUSI working group*

TOM with consignment & SMOI

I Pick and pack goods. The supplier will pick and pack the goods in order to be able to despatch the goods.

II Generate despatch notification. The supplier will generate the Despatch Advice and send the goods to the manufacturer, the goods being sent being considered as in transit.

III Receipt of despatch notification. The manufacturer will receive the Despatch Advice message and await the shipment of the goods. The manufacturer may integrate the information of the Despatch Advice into his ERP system. Having received notification of the goods being despatched, the IT system at the manufacturer's site will be ready to receive the goods and the reading of the Serial Shipping Container Code (SSCC) on the logistic unit (if applicable).

IV Receipt of goods. The manufacturer will then receive the goods shipped by the supplier or a third party service provider. The reading of the Serial Shipping Container Code (SSCC) on the logistic unit will confirm that these goods have arrived (if applicable).

V Generate receipt notification. The manufacturer will check the received goods against the Despatch Advice and identify any discrepancies. The material handler at the manufacturer site will then post the receipt notification in his ERP system thus updating the current stock on hand and its status. The actual posting of the receipt notification in the ERP system will trigger the Receiving Advice message to be sent to the supplier. At the same time, the inventory situation and status should be updated on both sites e.g. through having the manufacturer sending the new inventory information to the supplier. The Receiving Advice message will delete the stock in transit and the inventory message will reflect the updated inventory information.

Good receipts are based on the highest level of packaging for which an GS1 code is available. The packaging unit is as identified in the despatching notification and must be labelled according to GS1 logistics label standards (see EAN International report, Supply Chain Management Tools for the Packaging Industry, published in February 2000, pages 18 – 24).

VI Integrate receipt notification information in transaction system. The supplier will receive the Receiving Advice message, identify any discrepancies and may integrate the information contained into his own transaction system.

Any discrepancies identified either on manufacturer or supplier site should be resolved through communicating the discrepancies in the Receiving Advice message and/or in offline conversations.

VII Consumption of goods and generation of a Consumption Report. The manufacturer will consume the goods received from the supplier and create from that on agreed points in time the Consumption Report. The Consumption Report will be sent to the supplier.

VIII Integrate Consumption Report information in transaction system. The supplier will receive the Consumption Report and will integrate the information contained into his own transaction system.

If a Despatch Advice is sent to the manufacturer, then the Receiving Advice message is also required. Scenarios where both messages (Despatch Advice and Receiving Advice) might not be sent could be scenarios like Joint Collaboration and scenarios where Real Time Inventory is exchanged.

| Integration Agreement | Data Alignment | Purchase Conditions | Demand & Supply Signals | Despatch, Receipt & Consumption | Financial Settlement |

Despatch, Receipt & Consumption Signals

Despatch Advice message

- **Business Reason:** the Despatch Advice enables the supplier/carrier to provide detailed information about the content of a shipment and enables a buyer to reconcile or confirm the physical shipment against the order; it provides a mirror of the shipment that is to be made in terms of package details and in terms of structure of the delivery

- **Responsible Party:** the message will be sent by the supplier

- **Benefits:**

  ¤ manufacturer-side: anticipation of invoicing process, planning of receiving logistics (warehousing, quality control, etc.), support of goods scanning, enables traceability

  ¤ supplier-side: serves as basis for invoice creation or Self-Billing Invoice check (in case of Self-Billing), matching Despatch Advice with Receiving Advice from the buyer enables traceability

- **Timing/Frequency:** supplier/carrier will send a Despatch Advice to the buyer at the point of time of despatching the goods. The notification should arrive at the client site before the goods in order to enable appropriate planning and processing of the information; this message applies in TOM and SMI scenarios (incl. consignment)

- **Response:** no response to this message is required.

Receiving Advice message

- **Business Reason:** the Receiving Advice message is used to enable the buyer to notify the supplier of the receipt and acceptance/rejection of goods shipped to them; it communicates to the supplier any discrepancies (missing or damaged goods) to the Despatch Advice and can be used as the basis for the creation/validation of an invoice.

- **Responsible Party:** the message will be sent by the buyer

- **Benefits:**

  ¤ manufacturer-side: traceability, invoice alignment: checking of receiving goods against the Despatch Advice (in case of non-consignment), basis for Self-Billing invoice creation (in case of Self-Billing & non-consignment)

  ¤ supplier-side: proof of delivery, traceability, invoice alignment: anticipate and check Self-Billing invoice from the buyer (if using Self-Billing and non-consignment stock), matching Receiving Advice with Despatch Advice (in case of non-consignment), check inventory figures given by buyer (calculate stock in-transit)

- Timing/Frequency: buyer will send a Receiving Advice (based on the Integration Agreement) to the supplier after receiving the goods; this message applies in TOM and SMI scenarios (incl. consignment)

- **Response:** no response to this message is required.

Consumption Report message

- **Business**

Reason: the Consumption Report message enables the application of a consignment stock business scenario and the communication of Transfer of Ownership

- **Responsible Party:** the message will be sent by the buyer

- **Benefits:**

  ¤ manufacturer-side: allows Self-Billing invoice creation (in the case of Self-Billing and consignment stock) or invoice checking (in the case of invoicing and consignment stock)

  ¤ tsupplier-side: communication of Transfer of Ownership; matching of Consumption Reports with forecasts; allow invoice creation (in case of invoicing and consignment stock) or Self-Billing invoice checking (in case of Self-Billing and consignment stock)

- **Timing/Frequency:** the message is triggered by the agreed upon date and time for sending the consumption report (based on the Integration Agreement) and may be linked to the invoicing period. It is applicable in consignment scenarios (TOM and SMI scenarios)

- **Response:** no response to this message is required

| Integration Agreement | Data Alignment | Purchase Conditions | Demand & Supply Signals | Despatch, Receipt & Consumption | Financial Settlement |

4.6 Building Block 6: Financial Settlement

Scope

The "Financial Settlement" building block takes the process from where the goods delivered are owned by the manufacturer to the remittance notification. The exchange of messages regarding financial settlement on the supplier and manufacturer side, incl. invoicing, matching, remittance and payment is covered in this building block.

Description

Financial settlement mainly differs depending on whether the invoicing process is triggered by the supplier (traditional invoicing) or by the manufacturer (self-billing). Also, transfer of ownership is relevant to define the point of time and the basis for invoicing (non-consignment vs. consignment goods).

Following business scenarios can be distinguished regarding Financial Settlement:

Scenario 1 - TOM & SMI: Traditional Invoicing in a non-consignment business scenario

Scenario 2 - TOM & SMI: Traditional Invoicing in a consignment business scenario

Scenario 3 - TOM & SMI: Self-Billing in a non-consignment business scenario

Scenario 4 - TOM & SMI: Self-Billing in a consignment business scenario

Scenarios 1 (i.e. traditional invoicing and non-consignment) and 4 (i.e. self-billing and consignment) can play an important role in business context, as it can be e.g. more practical to handle non-consignment stock with traditional invoicing and consignment stock with self-billing. In the latter case the manufacturer has control over the quantities he consumes thus providing the opportunity to initiate at the same moment the invoicing process. The manufacturer would then – based on agreed criteria - make payment according to the material consumed.

Self-billing represents an invoicing practice, where the buyer will create an invoice directed at him and send it to the supplier. This invoice is based on the Receiving Advice in a non-consignment scenario or on the Consumption Report/manufacturer Inventory Activity in a consignment scenario.

Self-billing allows streamlining the invoice matching process on the buyer side, as the buyer will automatically create the invoice based on defined criteria like e.g. his own consumption in a consignment scenario.

In addition, on the seller side, self-billing can lead to improved cash flow, as querying and payment blocking is limited to the discrepancies/differences, and not to the total invoice amount.

The potential benefits and impacts through the application of self-billing might vary depending on the following factors:

• Extent to which Self-Billing is replacing "traditional" invoicing procedures

• The need for dedicated, ad-hoc application support for self-billing and the corresponding communication infrastructure

• Sophistication of sales-related processes

	Buyer	Seller	
Reduction of headcount and streamlining of activities in invoice matching	★★		**Most obvious and significant advantage for buyer, invoice matching dept is not clogged up with unmatchable invoices anymore**
Paper invoices processing & storage costs	★	★	
Headcount in customer invoicing			Not so high as could be expected. Depending on customer base and previous level of automation
Reduction in invoices querying	★	★	Querying and reconciliation are done by exception now
Improved cash flow		★★	**Biggest advantage for seller: querying and payment blocking now is limited to the difference, not to the invoice amount**
Headcount for payment clearing			Depending on previous level of automation
Need for dunning procedures		★	Should be less due to "customer approved" nature of self-billing invoice
Automation of exception handling	★		Slight advantage for buyer
Improved quality and timeliness of the cost picture in accounting and controlling	★		No costs are missing anymore due to unmatched invoices. Self-billing invoice is posted immediately, with all details (improved quality)
Improved data quality			Common advantage due to increased level of automation

Fig. 16. Potential benefits of Self-Billing for Buyer and Seller. *Source: GUSI working group*

- Buyer-Seller relationship and previous financial settlement situation between buyer and seller

- Required investment on processes and IT

Electronic invoicing (e-invoicing) represents an electronic form of invoicing, which can allow leveraging benefits significantly in the financial settlement area. In some regions the use of e-invoicing has some restrictions due to local legislation and tax authorities.

These barriers need to be overcome in order to allow a smooth implementation of e-invoicing. Uniform rules and interpretation will allow leveraging e-Invoicing to its full extent, e.g. paper invoice replacement through e-Invoicing.

e-Invoicing can provide significant benefits despite paper invoice replacement. These benefits created through the electronic transmission of invoicing data are amongst others:

- Automation of invoice matching
- Enabling of electronic payment
- Streamlined reconciliation and exception handling (disputes)
- Increased efficiency and reduction of errors as data is automatically loaded into finance and ordering systems – no keying or re-keying needed

	Non cons.	Cons.
Invoice	🔵	
Self-billing		

Scenario 1
TOM & SMI:
Traditional Invoicing in a non-consignment business scenario

Scope / Purpose

Financial settlement on Supplier and Manufacturer side, incl. Invoicing, Matching, Remittance and Payment

Key process steps -INVOICING:

Manufacturer

Supplier

II **Check invoice against Goods Receipt & Purchase Conditions**

← Invoice — I **Create invoice based on Despatch Notification OR Goods Receipt**

III **Check discrepancies** ✱

Invoice confirmation ⟶ **Review discrepancies**

Yes

No

Manually resolve price and/or quantity discrepancies ✱

Issue credit / debit note

IV **Initiate payment and generate Remittance Advice**

Remittance Notification ⟶ V **Check Remittance Advice OR Payment against Invoice**

Physical Payment ⟶

Manufacturer ▢   Supplier ▢   Common ▢   *Italic ➜ Optional*

✱ **Discrepancies outside agreed tolerances – Discrepancy checking & resolving automated in best practice scenarios**

Fig. 17. Financial Settlement Invoicing in TOM & SMI with non- consignment. *Source: GUSI working group*

Integration Agreement | Data Alignment | Purchase Conditions | Demand & Supply Signals | Despatch, Receipt & Consumption | Financial Settlement
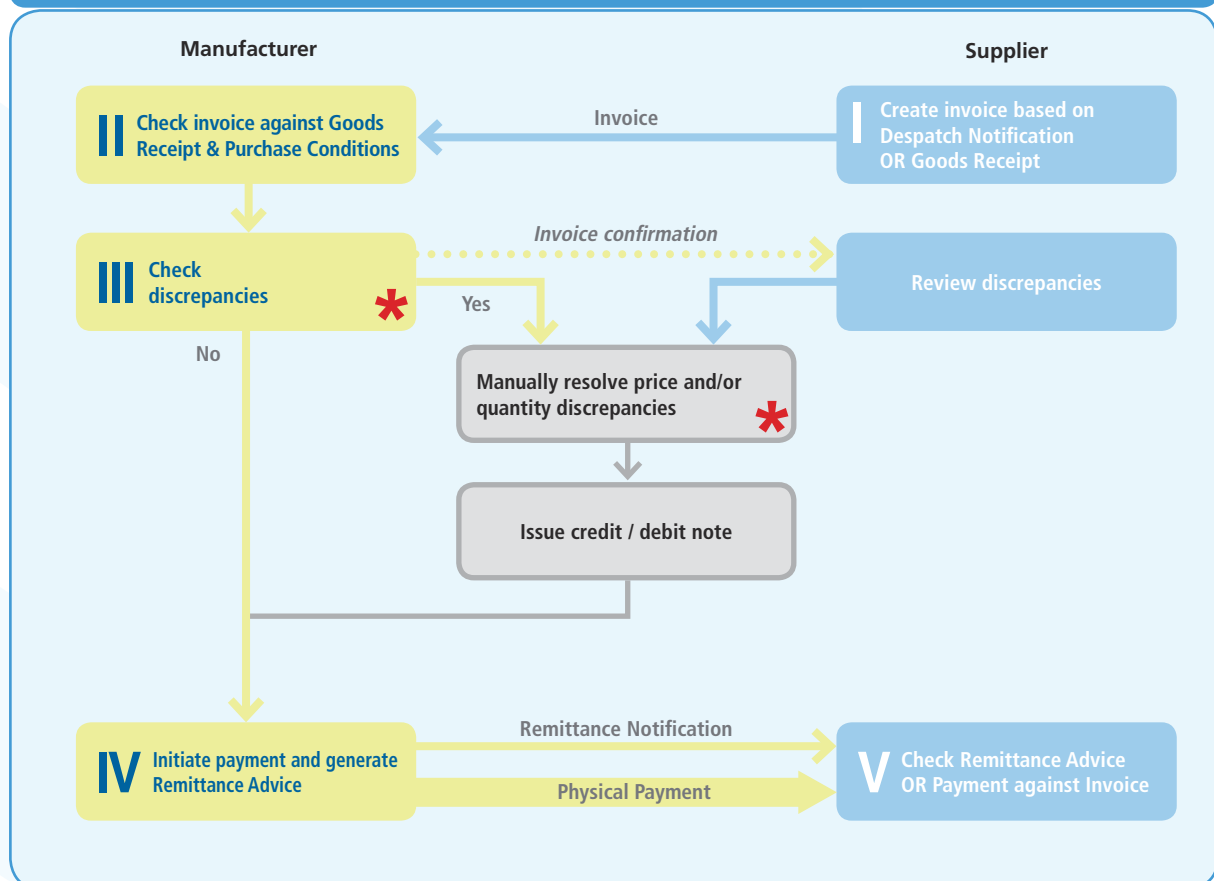
I Invoice creation and sending. The supplier will create and send an invoice which is either based on the Despatch Advice or on the Receiving Advice message.

In a best practice scenario, discrepancies between Despatch Advice and Receiving Advice should be resolved as early as possible, e.g. in the Despatch, Receipt & Consumption Building block, where Despatch Advice and Receiving Advice messages are exchanged for the first time.

If the invoice is based on the Receiving Advice, quantity discrepancies should not occur as they should have been solved in advance, meaning that the manufacturer does not need to apply the same invoice checking procedure.

II Invoice receipt and checking. The manufacturer will receive the invoice and check it against the Receiving Advice and the Purchase Conditions, where the underlying business conditions have been fixed. The invoice checking will especially take place in case the invoice is not based on Receiving Advice, but on the Despatch Advice.

III Discrepancy checking. The manufacturer can send an Invoice Response (invoice confirmation) message (see Invoice Response message) to the supplier in order to inform him in real-time, whether the invoice received is accepted or rejected. In case the manufacturer identifies discrepancies between the invoice and the agreed quantities/prices, these will need to be resolved between manufacturer and supplier on a manual basis and result in issuing a credit/debit note, which will account for an identified and agreed discrepancy.

If no discrepancies are identified, the manufacturer can initiate the payment.

In best practice scenarios, the invoice matching and discrepancy management will be automated and require limited to no manual handling. Electronic invoices instead of paper invoices will further enhance the automatic matching of invoices.

IV Initiate payment and generate remittance notification. If no discrepancies have been identified or all discrepancies have been resolved, the manufacturer can initiate the payment and create the Settlement message (remittance notification) detailing the payment which will be made.

V Payment checking. The supplier will receive the Settlement message which will allow him to match the incoming payment with issued invoice. In best practice scenarios the matching will be automated and require limited to no manual handling.
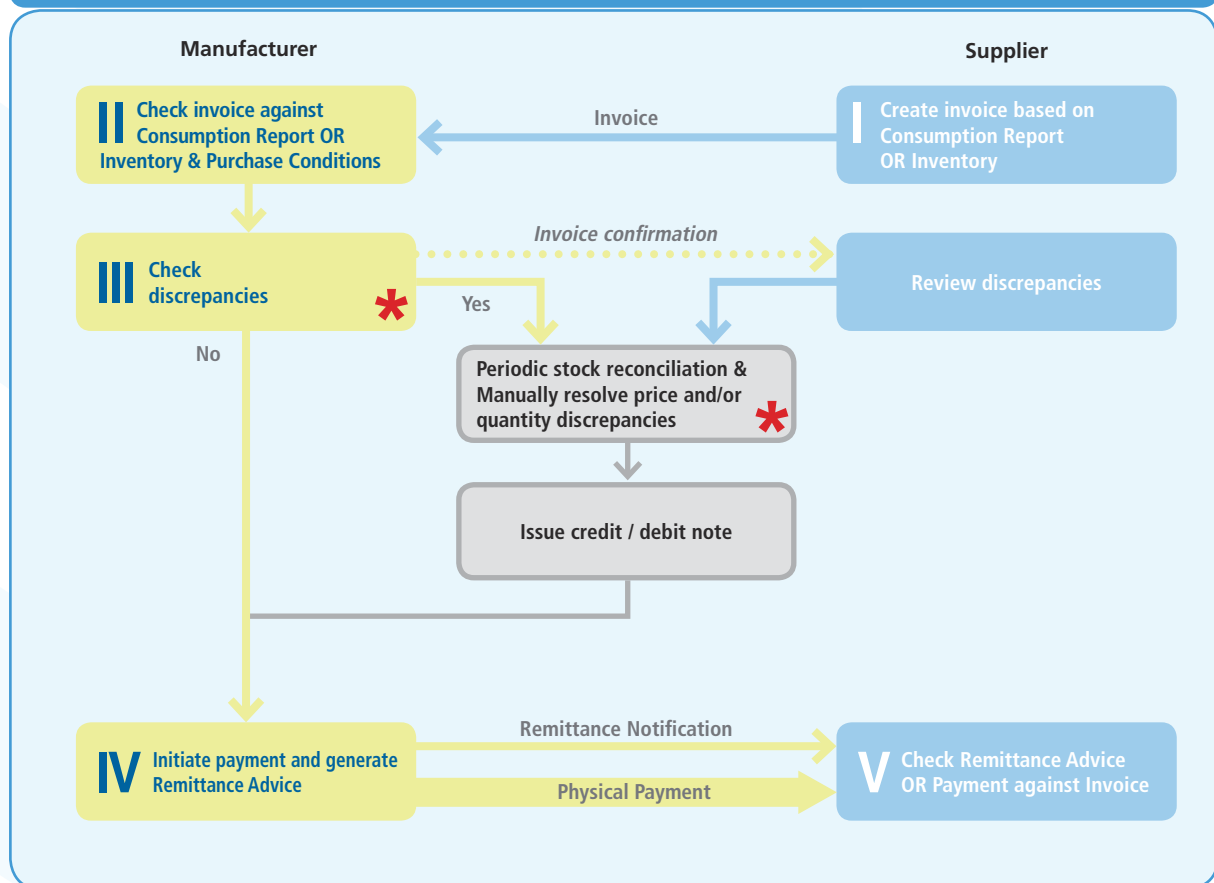
Integration Agreement → Data Alignment → Purchase Conditions → Demand & Supply Signals → Despatch, Receipt & Consumption → **Financial Settlement**

Scenario 2
TOM & SMI: Traditional Invoicing in a consignment business scenario

	Non cons.	Cons.
Invoice		●
Self-billing		

Scope / Purpose

Financial settlement on Supplier and Manufacturer side, incl. Invoicing, Matching, Remittance and Payment

Key process steps -INVOICING:

Manufacturer   **Supplier**

| **II** Check invoice against Consumption Report OR Inventory & Purchase Conditions | ← Invoice | **I** Create invoice based on Consumption Report OR Inventory |

III Check discrepancies ✱   — Invoice confirmation ····▸   Review discrepancies

Yes

No

Periodic stock reconciliation & Manually resolve price and/or quantity discrepancies ✱

Issue credit / debit note

| **IV** Initiate payment and generate Remittance Advice | Remittance Notification → / Physical Payment → | **V** Check Remittance Advice OR Payment against Invoice |

Manufacturer   Supplier   Common   *Italic* ➔ Optional

✱ Discrepancies outside agreed tolerances – Discrepancy checking & resolving automated in best practice scenarios

Fig. 18. Financial Settlement Invoicing in TOM & SMI with consignment & SMOI. *Source: GUSI working group*

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I Invoice creation and sending. The supplier will create and send an invoice which is either based on the Consumption Report or on the Inventory Activity/Inventory Status message. The supplier needs to be appropriately informed about the manufacturer's consumption of consignment goods in order to be able to issue an invoice. In case the invoice is based on the Inventory at the manufacturer site, visibility on the stock in transit is required.

II Invoice receipt and checking. The manufacturer will receive the invoice and check it against the Consumption Report or against the inventory information. In addition, he can also check the Purchase Conditions, where the underlying business conditions have been fixed.

III Discrepancy checking. The manufacturer can send an invoice confirmation (see Invoice Response message) to the supplier in order to inform him in real-time, whether the invoice received is accepted or rejected. In case the manufacturer identifies discrepancies between the invoice and the agreed prices, those will need to be resolved between manufacturer and supplier on a manual basis and result in issuing a credit/debit note, which will account for an identified and agreed discrepancy.

Quantity discrepancies can be identified when the supplier conducts periodical stock reconciliation at the manufacturer site. The conditions and frequency/timings of stock reconciliation will be agreed between the manufacturer and the supplier in the Integration Agreement. In case the supplier identifies discrepancies, those will need to be resolved between manufacturer and supplier on a manual basis and result in issuing a credit/debit note, which will account for an identified and agreed discrepancy.

If no discrepancies are identified, the manufacturer can initiate the payment.

In best practice scenarios, the invoice matching and discrepancy management will be automated and require limited to no manual handling. Electronic invoices instead of paper invoices will further enhance the automatic matching of invoices.

IV Initiate payment and generate remittance notification. If no discrepancies have been identified or all discrepancies have been resolved, the manufacturer can initiate the payment and create the Settlement message (remittance notification) detailing the payment which will be made.

V Payment checking. The supplier will receive the Settlement message which will allow him to match the incoming payment with issued invoice. In best practice scenarios the matching will be automated and require limited to no manual handling.
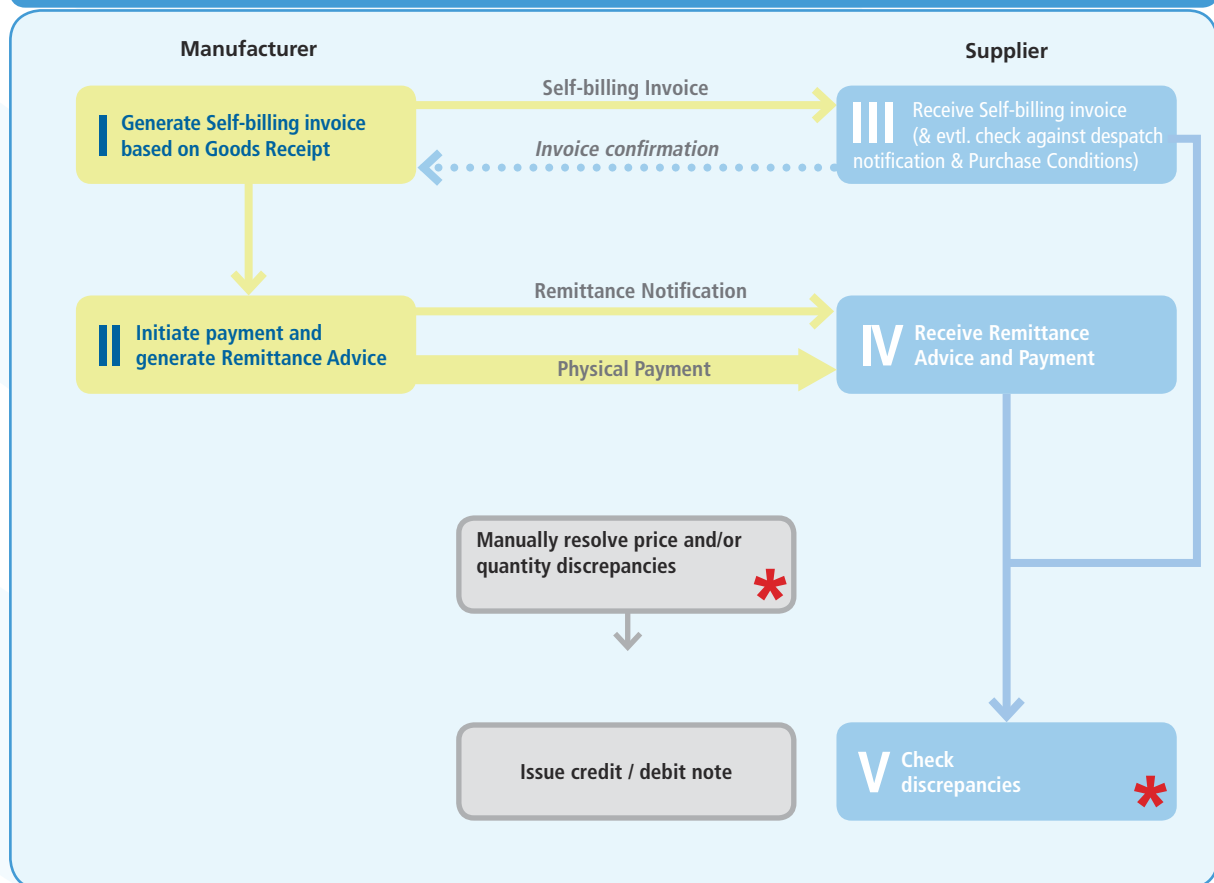
Integration Agreement — Data Alignment — Purchase Conditions — Demand & Supply Signals — Despatch, Receipt & Consumption — Financial Settlement

Scenario 3
TOM & SMI: Self-Billing in a non-consignment business scenario

	Non cons.	Cons.
Invoice		
Self-billing	●	

Scope / Purpose

Financial settlement on Supplier and Manufacturer side, incl. Invoicing, Matching, Remittance and Payment

Key process steps -Self-billing:

Manufacturer   **Supplier**

I Generate Self-billing invoice based on Goods Receipt

→ Self-billing Invoice →

III Receive Self-billing invoice (& evtl. check against despatch notification & Purchase Conditions)

← *Invoice confirmation* ←

II Initiate payment and generate Remittance Advice

→ Remittance Notification →
→ Physical Payment →

IV Receive Remittance Advice and Payment

Manually resolve price and/or quantity discrepancies ✱

Issue credit / debit note

V Check discrepancies ✱

Legend:
- Manufacturer
- Supplier
- Common
- *Italic* → Optional

✱ Discrepancies outside agreed tolerances Discrepancy checking, resolving and payment matching automated in best practice scenarios

Fig. 19. Financial Settlement Self-billing in TOM & SMI with non-consignment. *Source: GUSI working group*

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I Self-Billing Invoice creation and sending. The manufacturer will create and send a self-billing invoice to the supplier. The self-billing invoice is based on the Receiving Advice.

II Initiate payment and generate remittance notification. The manufacturer will then initiate the payment and create the Settlement message detailing the payment which will be made.

III Invoice receipt and checking. The supplier will receive the invoice and can check it against the Despatch Advice and the Purchase Conditions, where the underlying business conditions have been fixed. The supplier can send an invoice confirmation (see Invoice Response message) to the manufacturer in order to inform him in real-time, whether the self-billing invoice received is accepted or rejected.

IV Payment checking. The supplier will receive the Settlement message which will allow him to match the incoming payment with the invoice issued. In best practice scenarios the matching will be automated and require limited to no manual handling.

V Discrepancy checking. In contrast to the traditional invoicing business scenario, it will be the supplier instead of the manufacturer who will check for discrepancies between the invoice and the agreed prices. Potential price discrepancies will be identified by the supplier either when receiving the self-billing invoice or when the Settlement/Payment is received. In a best practice scenario, discrepancies between Despatch Advice and Receiving Advice should be resolved as early as possible, e.g. in the Despatch, Receipt & Consumption Building block, where Despatch Advice and Receiving Advice messages are exchanged for the first time. In this case, quantity discrepancies should not occur as they should have been solved in advance, meaning that the supplier does not need to apply the same self-billing invoice checking procedure.

In case the supplier identifies discrepancies, those will need to be resolved between manufacturer and supplier on a manual basis and result in issuing a credit/debit note, which will account for an identified and agreed discrepancy.

In best practice scenarios, the self-billing invoice matching and discrepancy management will be automated and require limited to no manual handling. Electronic self-billing invoices will further enhance the automatic matching of self-billing invoices.
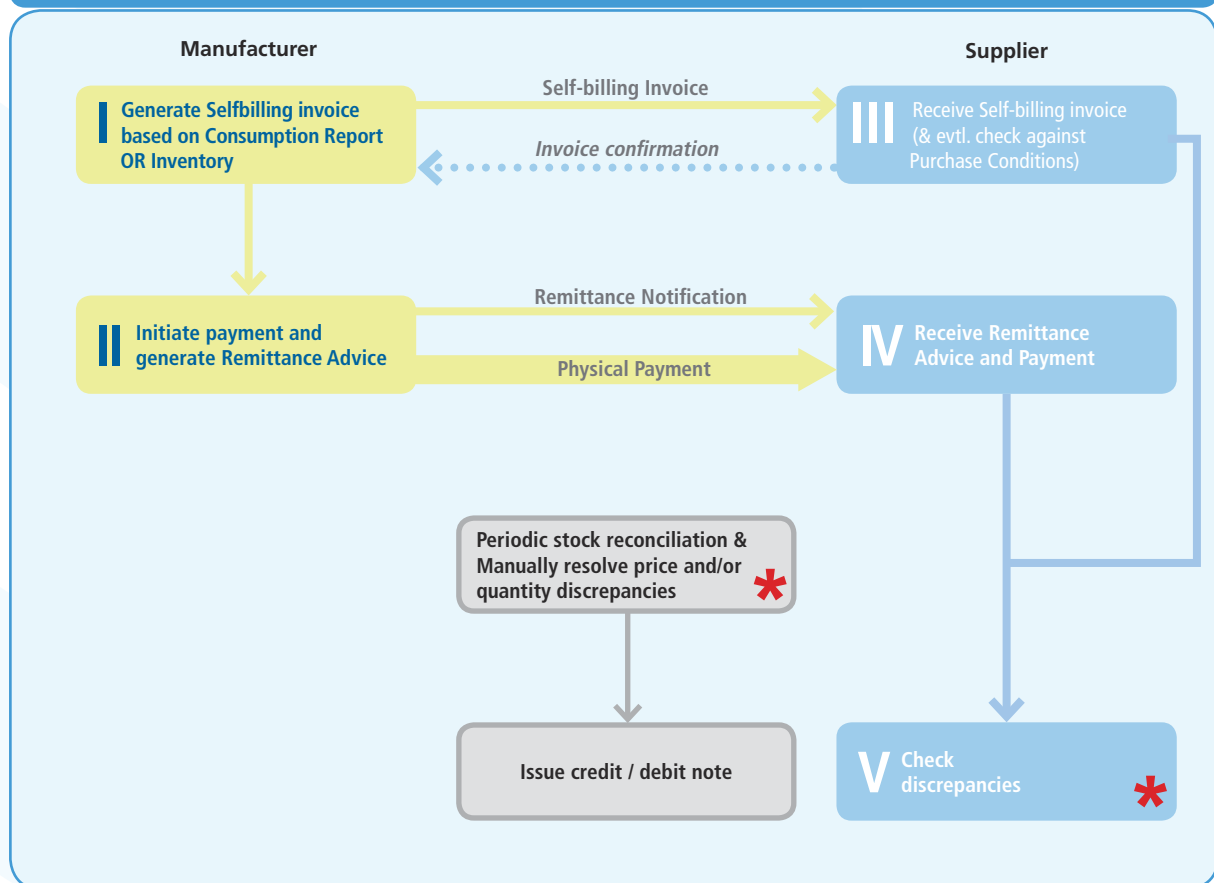
Integration Agreement | Data Alignment | Purchase Conditions | Demand & Supply Signals | Despatch, Receipt & Consumption | **Financial Settlement**

Scenario 4
TOM & SMI:
Self-Billing in a consignment business scenario

	Non cons.	Cons.
Invoice		
Self-billing		●

Scope / Purpose

Financial settlement on Supplier and Manufacturer side, incl. Invoicing, Matching, Remittance and Payment

Key process steps -Self-billing:

Manufacturer

I Generate Selfbilling invoice based on Consumption Report OR Inventory

— Self-billing Invoice →
← Invoice confirmation ·····

II Initiate payment and generate Remittance Advice

— Remittance Notification →
— Physical Payment →

Supplier

III Receive Self-billing invoice (& evtl. check against Purchase Conditions)

IV Receive Remittance Advice and Payment

Periodic stock reconciliation & Manually resolve price and/or quantity discrepancies ✱

Issue credit / debit note

V Check discrepancies ✱

☐ Manufacturer   ☐ Supplier   ☐ Common   *Italic ➔ Optional*

✱ Discrepancies outside agreed tolerances Discrepancy checking, resolving and payment matching automated in best practice scenarios

Fig. 20. Financial Settlement Self-billing in TOM with consignment & SMOI. *Source: GUSI working group*

I Self-Billing Invoice creation and sending. The manufacturer will create and send a self-billing invoice to the supplier. The self-billing invoice is based on the Consumption Report or manufacturer Inventory Activity/Inventory Status.

II Initiate payment and generate remittance notification. The manufacturer will then initiate the payment and create the Settlement message (remittance notification) detailing the payment which will be made.

III Invoice receipt and checking. The supplier will receive the invoice and can check it against the Purchase Conditions, where the underlying business conditions have been fixed. The supplier can send an invoice confirmation (see Invoice Response message) to the manufacturer in order to inform him in real-time, whether the self-billing invoice received is accepted or rejected.

IV Payment checking. The supplier will receive the Settlement message which will allow him to match the incoming payment with the invoice issued. In best practice scenarios the matching will be automated and require limited to no manual handling.

V Discrepancy checking. In contrast to the traditional invoicing business scenario, it will be the supplier instead of the manufacturer who will check for discrepancies between the self-billing invoice and the agreed prices. Potential price discrepancies will be identified by the supplier either when receiving the self-billing invoice or when the Settlement/Payment is received.

Quantity discrepancies can be identified when the supplier conducts periodical stock reconciliation at the manufacturer site. The conditions and frequency/timings of stock reconciliation will be agreed between the manufacturer and the supplier in the Integration Agreement. In case the supplier identifies discrepancies, those will need to be resolved between manufacturer and supplier on a manual basis and result in issuing a credit/debit note, which will account for an identified and agreed discrepancy.

Financial Settlement Signals

Invoice message

- **Business Reason:** the Invoice message enables the supplier to send an invoice to a buyer (i.e. a request for payment) relating to a previous order/purchase of goods and includes information on the contract(s) referenced, the line-item quantities and prices of each line-item delivered as well as the total value of the invoice. The Invoice message can reference multiple contracts, deliveries and items

- **Responsible Party:** the message will be sent by the supplier

- **Benefits:**

  ¤ manufacturer-side: validate invoice against Receiving Advice (non-consignment) or Consumption Report/Inventory (consignment)

  ¤ supplier-side: request for payment, alignment of quantities and prices

- **Timing/Frequency:**

  Non-consignment: supplier will send an Invoice (timing etc. based on the Integration Agreement) to the buyer a) after having despatched the goods, b) after having received the "Goods received" message from the buyer; Invoice is based on Despatch Advice or Receiving Advice (in the latter case Receiving Advice from the buyer has to be awaited). **Consignment:** supplier will send an Invoice (timing etc. based on the Integration Agreement) to the buyer after having received the Consumption Report/Inventory from the buyer; Invoice is based on Consumption Report or Inventory (in this case Consumption Report or Inventory information from the buyer have to be awaited) The Invoice message is applicable in **TOM** and **SMI** scenarios (incl. consignment)

- **Response:** an invoice confirmation (see Invoice Response message) can be sent by the manufacturer (optional).

Self-billing Invoice message

- **Business Reason:** the Self-billing invoice enables the buyers to invoice themselves and make payment accordingly. It includes information on the contract(s) referenced, the line-item quantities and prices of each line-item delivered as well as the total value of the invoice. The Invoice message can reference multiple contracts, deliveries and items.

- **Responsible Party:** the message will be sent by the buyer

- **Benefits:**

  ¤ manufacturer-side: proposed payment, alignment of quantities and prices, creation of a legal document, streamlined invoice matching and processing

  ¤ supplier-side: information about incoming payment

- **Timing/Frequency:**

  Non-consignment: manufacturer will send a Self-billing Invoice (timing etc. based on Integration Agreement) to the supplier after having received the goods; Self-billing Invoice is based on Receiving Advice (in this case creation of Receiving Advice has to be awaited) **Consignment:** buyer will send a Self-billing Invoice (timing etc. based on the Integration Agreement) to the supplier after having consumed the goods and created the Consumption Report/generate inventory information.

The Self-Billing invoice is based on Consumption Report or Inventory (in this case Consumption Report or Inventory information have to be awaited) The Invoice message is applicable in TOM and SMI scenarios (incl. consignment)

- **Response:** an invoice confirmation (see Invoice Response message) can be sent by the supplier (optional)

Invoice Response message

- **Business Reason:** the Invoice Response is an optional message and enables the recipient of an invoice (in traditional invoicing this will be the buyer; in self-billing this will be the supplier) to confirm that the invoice is accepted or rejected. The message can also detail, for which reason the invoice has been rejected

- **Responsible party:** buyer-side in case of traditional invoicing; supplier-side in the case of Self-billing

- **Benefits:**

  ¤ sender of invoice confirmation/recipient of an invoice: confirmation of invoice

  ¤ recipient of invoice confirmation / sender of an invoice: early/real-time confirmation of invoice status (accepted, rejected), allowing to follow up immediately if an invoice is rejected and thus potentially fasten the process of resolving open issues

- **Timing/Frequency:** invoice confirmation message is sent by the recipient of an invoice after having received the invoice and after having checked if the invoice is correct. The application of an Invoice Response message is optional and its usage (full confirmation: communicate accepted and rejected invoices vs. exceptions only: only communicate rejected

invoices) needs to be defined between the business parties. Applicable in TOM and SMI scenarios (incl. consignment)

- **Response:** none.

Settlement message

- **Business Reason:** the Settlement message is used to enable a buyer to notify a supplier of a forthcoming payment that is to be made for goods that were previously received. The Settlement message provides a detailed accounting description of any payments made in line with contracts, invoices and goods delivered to the buyer. It should only be sent in line with the processing of a payment to a supplier

- **Responsible Party:** the message will be sent by the buyer

- **Benefits:**

  ¤ supplier-side: information about incoming payment, enables automatic matching between invoices and payments, detailed accounting description of one or consolidated payments

- **Timing/Frequency:** buyer will send the Settlement message after having received an invoice from the supplier/after having sent the Self-billing Invoice and before realising the payment; The Settlement is based on one or a number of invoice(s) and applicable in TOM and SMI scenarios (incl. consignment)

- **Response:** the message requires no response from the supplier.

5 Data Interchanges

5.1 Building Block 1: Integration Agreement

Overall Integration Agreement

This is a document or set of documents that is put together by the manufacturer and the supplier. The essential information is stored in the transaction systems of the companies. No electronic interchange is foreseen within the standard UIM model.

An Integration Agreement could contain following elements (exemplary & non-exhaustive):

1. Contract Reference

2. Document creation date

3. Supplier Reference

4. Validity Date (start)

5. Review Period

6. Purpose and description of the business processes

7. Roles & responsibilities:
   ¤ Supplier side
   ¤ Manufacturer side

8. Contact Persons:
   ¤ Supplier side
   ¤ Manufacturer side

9. List & details of relevant locations (Name, address, account details, legal/fiscal information, facility specifications, relationship roles, etc.)

10. Messages between buyer and the seller and specific business rules

11. Planning & Stock Management

11.1. Planning Cycle/Frequency and Planning Horizon (including frozen period)

11.2. Historical Requirement Cycle and possible seasonality

11.3. Safety Stock Level, Target Stock Level (stock cover days & quantity)

11.4. Minimum/Maximum Stock level by Plant

11.5. Stock Status to be agreed and defined with seller

11.6. Seller Capacity Constraint

11.7. Seller contingency plan (alternative supply sources/back-ups)
- ¤ Stock in transit
- ¤ Ownership (responsibility, assurance, redundant stock….)

12. Delivery

12.1. Conditions for over and under delivery, Tolerances for contracted quantity and delivered quantity

12.2. Definition of Unit of Measure (UoM)

12.3. Global Location Number (GLN)/ Global Trade Identification Number (GTIN)

12.4. Minimum order quantity

12.5. Despatch time of Despatch Notification document

12.6. Transportation and freight

12.7. Customs clearance

12.8. Packaging type

12.9. Traceability requirements

13. Payment

13.1. Invoicing procedures

13.2. Procedures of invoice discrepancies

13.3. Legal requirement of self-billing

13.4. Frequency of self-billing and Consignment Settlement

13.5. Payment terms

13.6. VAT and import duty/taxes issues

13.7. Rules of price fixations (valid for tradable commodities)

14. Claims

14.1. Claim procedures

14.2. Contact persons and escalation procedures

15. Performance Measurement

15.1. Monitoring responsibilities (KPI)
- ¤ Supplier side
- ¤ Manufacturer side

16. System Security

16.1. Agreement of data exchange channels

16.2. Security parameters

16.3. Security standards and procedures

16.4. Recovery plans

16.5. Authorisation and control procedures (Roles)

17. Confidentiality/Non-disclosure Agreement

18. Quality
- ¤ Auditing
- ¤ Specification

19. Legal Terms & Conditions

5.2 Building Block 2:
Master Data Alignment

See the GUSI Implementation Guide and GS1 website for the detailed message specification.

UIM transaction	GS1 message
Item Master Data	Item Data Notification

5.3 Building Block 3:
Purchase Conditions

See the GUSI Implementation Guide and GS1 website for the detailed message specification.

UIM transaction	GS1 message
Purchase Conditions	Purchase Conditions

5.4 Building Block 4:
Demand & Supply Signals

See the GUSI Implementation Guide and GS1 website for the detailed message specifications.

UIM transaction	GS1 message
Inventory	Inventory Activity or Inventory Status
Purchase Order	Multi Shipment Order
Purchase Order Response	
Order Response	
Net Requirements	Goods Requirements
Net Requirements Confirmation	Goods Requirements Response
Consumption Forecast	Goods Requirements
Replenishment Forecast	Replenishment Request
Delivery Plan	Replenishment Proposal

5.5 Building Block 5: Despatch, Receipt & Consumption

See the GUSI Implementation Guide and GS1 website for the detailed message specifications.

UIM transaction	GS1 message
Despatch Notification	Despatch Advice
Receipt Notification	Receiving Advice
Consumption Report	Consumption Report

5.6 Building Block 6: Financial Settlement

See the GUSI Implementation Guide and GS1 website for the detailed message specifications.

*This message is still in development by GS1.

UIM transaction	GS1 message
Invoice	Invoice
Invoice Confirmation	Invoice Response
Credit Invoice	Invoice
Remittance Notification*	Settlement*
Self-Billing Invoice	Invoice
Self-Billing Invoice Confirmation	Invoice Response
Self-Billing Credit Invoice	Invoice

6 Conclusions
& Recommendations

All members of the GUSI working group agree that there is commonality between their business processes and that development of a common Upstream Integration Model (UIM) applicable to the CPG industry can benefit both manufacturers and suppliers.

As a result of the work that has been done, the working group makes the following recommendations for the CPG industry:

1

The UIM needs to be developed through the GS1 Global Standards Management Process (GSMP). This includes detailed descriptions of the data elements as well of the semantics of the data flows. GSMP is developed by GS1 to provide companies with global systems for identification, tracking and tracing of products across the supply chain. GSMP is a user-driven process. This enables user involvement in the management of the GS1 systems.

2

The parties will have to work with GS1 and other global bodies to gain support for this upstream supply chain approach. The objective is not only to develop standards but even more importantly, to implement these.

3

Companies have to recognise that they have to become member of the national GS1 organisations to be allowed to use the GTIN/GLN codes and the e-commerce standards.

7 Outlook
- Where next?

In the version 2.0 UIM report, the GUSI group originally identified the following topics (in random sequence) which should be addressed in future versions of the UIM. All of these were considered to have significant impact on the interaction between manufacturers and material suppliers and their supply chains.

- Master Data Synchronisation
- Product lifecycle management
- Integration of third parties
- Collaborative business scenarios
- Supply network and real collaboration
- RFID

Since September 2004, the GUSI group has re-visited the future of UIM and is currently proposing to investigate the areas listed below. However no decision has yet been taken on which areas will definitely feature in a UIM version 3.

» **Master Data Synchronisation:** analysis of the applicability for the use in the upstream of master data synchronisation concepts (including GTINs and GLNs) developed in the downstream between manufacturers and retailers as currently supported by the Consumer Goods Forum based on GS1 standards.

» **Integration of third parties:** integration with logistics service providers managing parts of the supplier-manufacturer supply chains for distribution (warehousing) and transport.

» **Supplier Relationship Management:** covering the area of document management (for contracts, etc), scorecards for KPIs, product data sheets, safety data sheets and product specification.

» **Contract manufacturing:** applying the same concepts of upstream integration to contract manufacturers, but also looking at the detailed planning processes involved.

» **Portal standardisation:** develop guidelines for the standardised use of portals as part of the manufacturer-supplier communication process.

» Invoicing: continue the work already begun in UIM v2 to address the issue of cross-border tax and legal issues surrounding e-billing and dematerialisation.

Appendix A
Transfer of Ownership

Transfer of Ownership characterises the point of time, where the ownership of the goods is transferred from the supplier to the manufacturer.
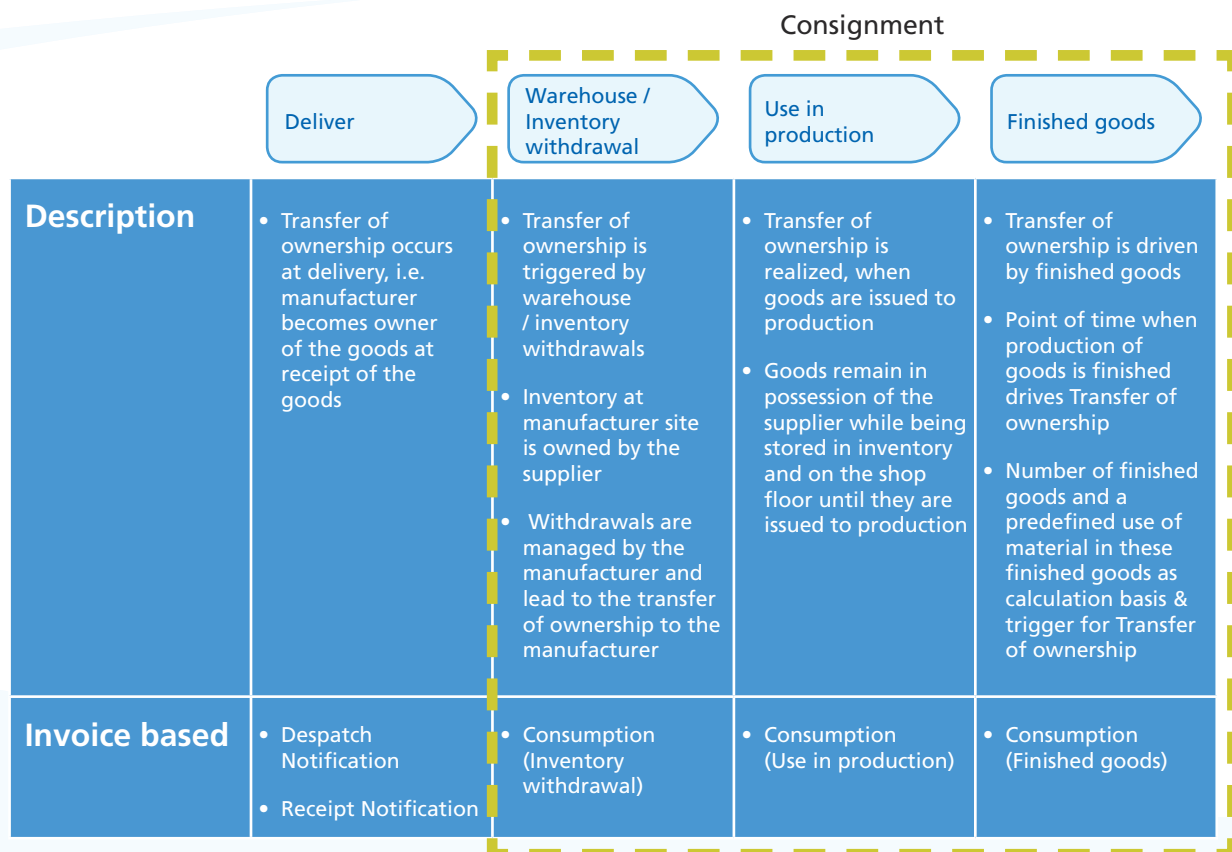
Consignment

	Deliver	Warehouse / Inventory withdrawal	Use in production	Finished goods
Description	• Transfer of ownership occurs at delivery, i.e. manufacturer becomes owner of the goods at receipt of the goods	• Transfer of ownership is triggered by warehouse / inventory withdrawals • Inventory at manufacturer site is owned by the supplier • Withdrawals are managed by the manufacturer and lead to the transfer of ownership to the manufacturer	• Transfer of ownership is realized, when goods are issued to production • Goods remain in possession of the supplier while being stored in inventory and on the shop floor until they are issued to production	• Transfer of ownership is driven by finished goods • Point of time when production of goods is finished drives Transfer of ownership • Number of finished goods and a predefined use of material in these finished goods as calculation basis & trigger for Transfer of ownership
Invoice based	• Despatch Notification • Receipt Notification	• Consumption (Inventory withdrawal)	• Consumption (Use in production)	• Consumption (Finished goods)

Fig. 21. **Transfer of Ownership characteristics**. *Source: GUSI working group*

Transfer of Ownership can occur at different points in time, e.g. at delivery or at time of consumption – the latter being known as a consignment scenario. The most common variants of a consignment scenario include:

» Consumption triggered by warehouse/inventory withdrawal

» Consumption triggered by use in production

» Consumption triggered by number of finished goods.

The use of a **Consignment** scenario is applicable in both, **TOM** and **SMI** – SMI being a more typical scenario for the use of consignment, then known as SMOI (Supplier Managed & Owned Inventory). Consignment will have an impact especially on the "Financial Settlement" building block, where the basis for issuing an invoice/self-billing invoice is impacted:

» **Non-Consignment:** supplier invoice is based on "Despatch Notification/Receipt Notification" or manufacturer Self-Billing invoice is based on "Receipt Notification".

» **Consignment:** supplier invoice or manufacturer self-billing invoice is based on manufacturer "Consumption Report/Manufacturer Inventory"

In addition to this, a "Consumption Report" will most likely be sent in a Consignment scenario, in order to allow the supplier to a) issue an invoice based on the manufacturer's consumption or b) to allow the supplier to check the self-billing invoice against the manufacturer's consumption.

In consignment

	Delivery	Warehouse / Inventory withdrawal	Use in production	Finished goods
Advantage	• Simplest method • Single point of time for transfer of ownership • Clear & defined documentation of Transfer of ownership	• Simplest and clearest consignment method	• Transfer of ownership point of time near to usage of goods in production	• Clear calculation basis (finished goods)
Potential Issues	• Damages or losses during delivery / 3rd party provider • Quantity & documentation discrepancies • Incomplete & incorrect documentation (e.g. Receipt Notification)	• Multiple points of time for transfer of ownership (with each inventory withdrawal) • Handling of broached packages • Potentially additional work for suppliers due to period based reconciliation & discrepancy management	• No closed warehouse situation, thus more possibilities of unreported consumption • Complex reporting structure • Damages/ Shrinkage before production (on shop floor) • Transfer of ownership impacted through lead times until production • Potentially additional work for suppliers due to period based reconciliation & discrepancy management	• Damages/ Shrinkage during production (on shop floor) • Transfer of ownership impacted through long lead times • Discrepancies through variances in material use in finished goods • Potentially additional work for suppliers due to period based reconciliation & discrepancy management

Fig. 22. **Transfer of Ownership.** *Source: GUSI working group*

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The different scenarios for transfer of owner-ship vary in terms of characteristics. Some of the main advantages and potential issues are listed below for illustration purposes.

The consignment scenarios share certain re-quirements:

» **Responsibility & Trust:**

  ¤ Buyer responsibility for inventory manage-ment owned by the supplier

 ¤ Strong and trustful relationship between manufacturer and supplier required (also applies to self-billing)

» **Process set-up:**

  ¤ Same process and proceedings of goods (Despatch Notification, Purchase Order etc.) for non-consignment and consignment goods required to ens ure smooth handling

  ¤ Period based reconciliation & discrepancy management

» **Contractual set-up to cover principles to be followed and potential consignment issues:**

  ¤ Consignment agreement needs to cover phase-out of products, end of relationships, when which product from which supplier is used (in case of multiple consignment deals for one product type), valuation of goods, liability questions, how to handle and where to report shrinkage etc.

  ¤ Handling of unreported consumption

  ¤ Commitment on buyer side to buy remain-ing inventory after defined period in time (Protection clause for supplier)

  ¤ Commitment on supplier side to only pro-vide required goods, e.g. in SMI Consign-ment scenarios (Protection clause for buyer)
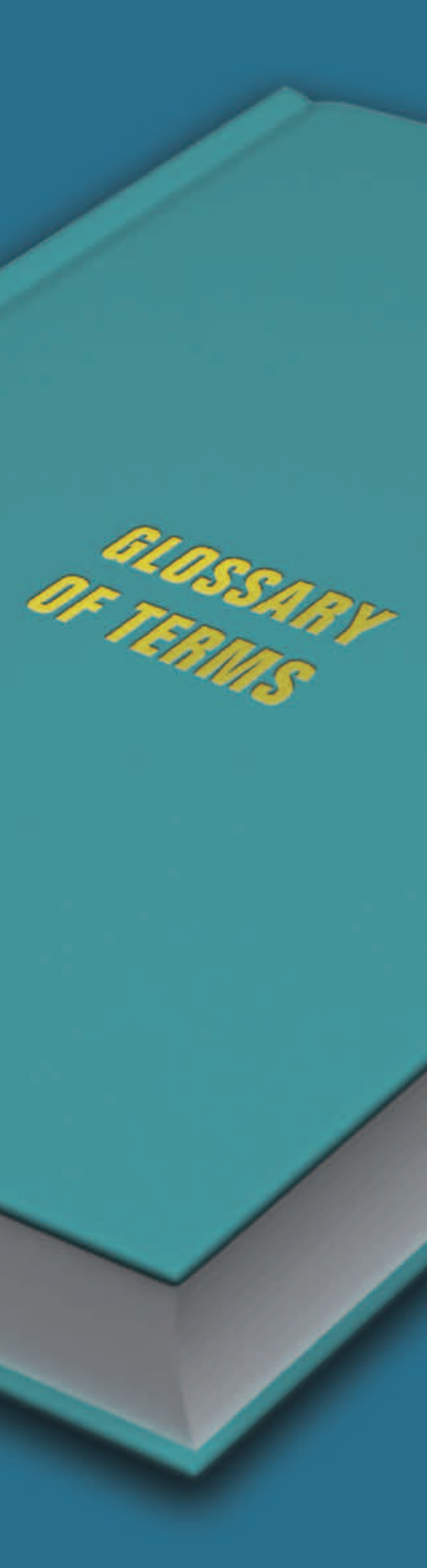
Appendix B
Glossary of Terms

Advanced Shipping Notice
Synonym for Despatch Notification; see Despatch Notification message

Buyer
Consumer Packaged Goods (CPG) manufacturers, taking over the role of buyers in the buyer-seller relationships described in this report.

CMI
(Co-Managed Inventory)
In CMI, a proposal order is generated by the supplier, and revised and confirmed by the buyer. The fundamental difference between Supplier Managed Inventory (SMI) and Co-Managed Inventory (CMI) is the fact that the buyer maintains the responsibility for the replenishment in Co-Managed Inventory.

Consignment
Consignment stock characterises a business scenario, where the goods delivered to the manufacturer remain in possession of the supplier until defined points of consumption.

Continuous Replenishment Programme
Overall concept with specific implementations for downstream VMI, and upstream SMI, as well as more partnership-related programmes such as CMI and SMOI.

The concept of continuous supply of goods between supplier and trade partner based on automated exchange of current demand, inventory and stock management information, within the framework of an agreed supply policy. The aim of CRP is to achieve a responsive and precise flow of product to the store, with minimum stock holding and handling.

CPG
Consumer Packed Goods

Despatch Advice
Synonym for Despatch Notification; see Despatch Notification message

Despatch Notification
See Despatch Notification message

Downstream
Flow of goods and services from the manufacturer to the final user or consumer.

EAN
(European Article Numbering)
International association whose objective is to establish a global multi-industry system of identification and communication for products and services based on internationally accepted and business-led standards. (GS1)

GS1
(EAN International and The Uniform Code Council)
EAN International and The Uniform Code Council, a Member Organisation of an expanded EAN International, are voluntary standards organisations charged by their respective boards with the co-management of the GS1 System and the Global Standard Management Process (GSMP). The GS1 System standardises bar codes, EDI transactions sets, XML schemas, and other supply chain solutions for more efficient business.

GS1 logistics label
Standard label format, defined by EAN International and UCC. This label can be affixed to any logistics unit. In particular, it includes information symbolised by UCC/EAN-128 bar codes (particularly the SSCC).

ECR
(Efficient Consumer Response)
A joint initiative by members of the supply chain to work on, to improve and optimise aspects of the supply chain to create benefits for the consumer e.g. lower prices, more choice variety, better product availability.

ERP
(Enterprise Resource Planning)
Packaged software systems using database technology and a single interface to control all the information related to a company's business - including customer, product, employee, and financial data.

EPC
(Electronic Product Code)
Coding structure for radio frequency tags.

GDD
(Global Data Dictionary)
The development of new e-business standards by EAN and the UCC has created a critical need to store, reuse and share precise core component and business definitions and their equivalent representations in targeted standards such as EDI, XML and AIDC. The storage for this data is the GS1 Global Data Dictionary (GDD). This repository is developed to fully support the GS1 Business Message Standards and GS1 XML Standard Schemas.

GLN
(Global Location Number)
Abbreviation of the GS1 Global Location Number (international location +or function code) using a 13-digit structure.

GSMP
(Global Standards Management Process)
EAN International and the Uniform Code Council, Inc. (UCC) created the Global Standards Management Process (GSMP) to support standards development activity for the GS1 System. The GSMP was developed to maintain standards-based solutions for global trade using GS1 System technologies. The GSMP uses a global consensus process to develop supply chain standards that are based on business needs and user-input.

The objective of the GSMP is to bring together users from all industries, from anywhere in the world, to allow for a uniform approach and methodology for global standards management. This includes but is not limited to standards development, standards maintenance, and implementation support.

GTIN
(Global Trade Item Number)
Abbreviation of GS1 Global Trade Item Number. The GTIN may be one of the following standard codes: EAN/UCC-8, UCC-12, EAN/UCC-13 or EAN/UCC-14.

Item (EAN definition)
An Item is any product or service upon which there is a need to retrieve pre-defined information and that may be priced, ordered or invoiced at any point in any supply chain.

KPI
(Key Performance Indicator)
Measures that are deemed essential in monitoring the performance of a business e.g. service level, profitability.

Logistic unit
Unit of any composition made up for the purposes of transport and/or storage and which must be managed throughout the entire supply chain.

Manufacturer
Consumer Packaged Goods (CPG) manufacturers, taking over the role of buyers in the buyer-seller relationships described in this report.

Master Data
Master Data is a set of data, which describes the specifications and structures of each Item and Party involved in Supply Chain Processes. Each set of data is uniquely identified by a Global Trade Item Number (GTIN) for products and the Global Location Number (GLN) for Party details.

In this report, item master data has been distinguished in general and specific item information. General item information is generally shared between multiple parties and is relationship independent (e.g. GTIN, item description, measurements, catalogues prices, standard terms, GLN, addresses).

Globally, specific item information concerns all terms bilaterally agreed and communicated between partners such as marketing conditions, prices and discounts, logistics agreements, etc. Master Data is the foundation of business information systems.

Master Data Alignment

Master Data Alignment is the process of timely distribution of accurate Master Data from one partner to others and the correct use of this data. Such alignment and use of Master Data leads to more accurate business transactions and therefore reinforce the efficiency of the supply chain operations. Successful Master Data Alignment can be achieved via the use of GS1 coding specifications throughout the supply chain, communication of all changes and new information between trading partners and use of the information exchanged in subsequent transactions.

MDS
(Master Data Synchronisation)

Master Data Synchronisation is the process of continuous harmonisation of data attribute values between all trading partners within the supply chain through the use of standards.

MRP
(Material Requirements Planner)

Person responsible for calculating material requirements and recommending the release of replenishment orders for materials, including recommendations to reschedule open orders when due dates and need dates are not in-sync.

Party (GS1 definition)

A Party (or) Location is any legal, functional or physical entity involved at any point in any supply chain and upon which there is a need to retrieve pre-defined information.

RFID
(Radio Frequency Identification)

A method of identifying unique items using radio waves. Typically, a reader communicates with a tag, which holds digital information in a microchip. Also, there are chip-less forms of RFID tags that use material to reflect back a portion of the radio waves beamed at them.

Remittance Advice

Synonym for Remittance Notification; see Remittance Notification message.

Remittance

See Remittance Notification message

Seller

Consumer Packaged Goods (CPG) suppliers (e.g. of direct materials), taking over the role of sellers in the buyer-seller relationships described in this report.

SSCC
(Serial Shipping Container Code)

The unique identification number for a logistic unit using a standard 18-digit code structure.

SKU
(Stock Keeping Unit)

A uniquely identifiable line within a product range. A particular product may have many different variations e.g. 20 percent extra free, discounted price marked etc. Each of these variations has a unique SKU.

SMOI
(Supplier Managed & Owned Inventory)
Describing a SMI business scenario with consignment stock.

SMI
(Supplier Managed Inventory)
In SMI the supplier manages the stock levels and availability in his customer's warehouse, based on forecast demand. Whereas Vendor Managed Inventory (VMI) is used downstream, Supplier Managed Inventory (SMI) reflects the corresponding term for upstream. Also referred to as "supplier driven" scenario.

Supplier
Consumer Packaged Goods (CPG) suppliers (e.g. of direct materials), taking over the role of sellers in the buyer-seller relationships described in this report.

TOM
(Traditional Order Management)
Orders are initiated by the manufacturer and sent to the supplier via a Purchase Order or via a Net Requirements message. Also referred to as "manufacturer driven" scenario.

Transfer of Ownership
Point of time, when ownership of goods is transferred from the supplier to the manufacturer, e.g. at delivery, at warehouse

withdrawal, at use in production or triggered by output of finished goods.

UCC
(Uniform Code Council)
A non-profit organisation dedicated to the establishment and promotion of multi-industry standards for product identification and related electronic communication. The organisation's goal is to enhance supply chain management and add value to the consumer. (GS1)

UCC/EAN-128
Structured string of alphanumerical characters constituting a piece or pieces of information of fixed or variable length, in which each piece of information is preceded by its identifier. The Application Identifiers (AI) together with the structure and length of the data strings they serve to introduce, are defined by EAN International. The term UCC/EAN-128 also means the Bar code used to translate these data. The following may also be translated into UCC/EAN-128 code: a container code (SSCC), an EAN/UCC-13 or EAN/UCC-14 code, a batch number, a date, a weight, etc.

Upstream
Flow of goods and services from raw & pack suppliers to manufacturers. The opposite of downstream.

VAT
Value Added Tax.

VMI
(Vendor Managed Inventory)
In VMI the vendor manages the stock levels and availability in his customer's warehouse, based on forecast demand. Whereas Vendor Managed Inventory (VMI) is used downstream, Supplier Managed Inventory (SMI) reflects the corresponding term for upstream.

XML
(Extensible Mark-up Language)
XML is the universal format for structured documents and data on the Web. XML is a flexible way to create common information formats and share both the format and the data on the World Wide Web, intranets, and elsewhere.

Appendix C
Other Sources
of Interest

For further information please refer to the following documents and websites:

Integrated Suppliers
ECR-Europe, 2000

**Supply chain management tools
for the packaging industry**
EAN•UCC, 2000

**Continuous Replenishment - How to use
the EAN•UCC Standards**
EAN•UCC, 2000

GS1 Homepage:
www.gs1.org

ECR Europe Homepage:
www.ecr-all.org

The Consumer Goods Forum:
www.theconsumergoodsforum.com

About The Consumer Goods Forum

The Consumer Goods Forum (CGF) is a global, parity-based industry network, driven by its members. It brings together the CEOs and senior management of over 400 retailers, manufacturers, service providers and other stakeholders across 70 countries and reflects the diversity of the industry in geography, size, product category and format.

Forum member companies have combined sales of EUR 2.1 trillion. The Forum was created in June 2009 by the merger of CIES - The Food Business Forum, the Global Commerce Initiative (GCI) and the Global CEO Forum. The Consumer Goods Forum is governed by its Board of Directors, which includes 50 manufacturer and retailer CEOs and Chairmen.

The Forum provides a unique global platform for knowledge exchange and initiatives around five strategic priorities – Emerging Trends, Sustainability, Safety & Health, Operational Excellence and Knowledge Sharing & People Development – which are central to the advancement of today's consumer goods industry.

The Forum's vision is: "Better lives through better business". To fulfil this, its members have given the Forum a mandate to develop common positions on key strategic and operational issues affecting the consumer goods business, with a strong focus on improving processes in non-competitive areas.

The Forum's success is driven by the active participation of the key players in the sector, who together develop and lead the implementation of best practices along the value chain.

With its headquarters in Paris and its regional offices in Washington, D.C., and Tokyo, the CGF serves its members throughout the world.

The Consumer Goods Forum
The Global Network Serving Shopper & Consumer Needs

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