

Project report



Improved handling and administration of returnable packaging in the automotive industry

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Executive Summary

Suppliers in the automotive industry experience that handling and administration of returnable packaging is inefficient and resource intensive and creates many problems.

The overall business objective of the project is to create the prerequisites for a standardised and automated process between the supply chain parties for the exchange of information, by proposing a uniformed best practice process and improved standards for the systems integrations.

The project addresses this with:

1. Describing and analysing current situation and business improvement focussing on the handling and administration of returnable packaging.
2. Defining best practice processes and information exchange between partners.
3. Defining EDI concept for information exchange.
4. Influence and act as a reference group to the European packaging management project managed by Odette International.

Summary of the findings:

1: Describing and analysing current situation and business pains

The OEM's and the suppliers packaging instructions systems are not integrated. This results in duplication of work, as updates need to be done in several local systems. The risk of deviations between the different systems is also a problem. Wrong packaging instructions result in wrong ordering, wrong packaging/shipping and stock balance deviations.

The planning is normally done manually at the suppliers giving less precision and intensive resource need.

For packaging material ordering, the pull principle is more common than the push principle, meaning that suppliers must register their order of packing material in the OEM's web portal. Every OEM has their own unique web portal, so the more customers a supplier has, the more web portals they must register in and the more resources they need.

Lack of planning, no delivery notification, deficient labelling and no proper goods reception result in quantity deviations and that stock balance figures are often wrong. Not being able to justify their balance figures can be an expensive affair for the supplier as they need to pay for the deviations (lost packaging).

The packaging material as such is also a problem because each OEM has their own packaging material system. The fact that some OEMs just allow tier1 as a packaging user is not helping the situation. The consequences are further more types of packaging, systems and tools.

2&3. Defining best practice processes and information exchange ...

A main prerequisite for our best practice recommendation is that packaging items must be treated as normal material items from an IT system and planning perspective.

The project does not recommend which concept to use (pull vs push), although the pull concept is the most common concept today. The project has, however, described best practices for each concept.

A transport label according to the Odette labelling standard must be used for the shipped material as well as for the packaging. At goods reception, not only the received quantity of materials shall be verified, also the received quantity of packaging. In the same way, the supplier must verify the reception of empty packaging. The Packaging Provider is updating stock balances when the packaging is relocated between the different parties according to the relevant messages.

Deviation processes will be manual and are not described in this process recommendation.

The project has also been analysing if the proposed best practice concept can support different supply chain scenarios where returnable packaging is used. The conclusion is that it can.

EDI-messages must be used for information exchange between the parties. The packaging project within Odette International should further explore how packaging should be described in the messages.

4. Influence and act as a reference group

This step starts the process of describing the results for the European project, helping the involved parties to agree on best choice forward.

Two representatives from the project as well as the Manager Director of Odette Sweden will participate in the European project. The rest of the group acts as the reference group but also as the implementation group in Sweden.

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References

If you would like to have more information about this project report or if you would like to have information about the Swedish project, you can contact:

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1 Introduction

1.1 Background

Suppliers in the Automotive industry experience that handling and administration of returnable packaging are inefficient and resource intensive and creates many problems.

The main problems are:

- Planning, ordering and reporting processes are not harmonized and standardized between the main actors. Ordering and reporting are normally done via different web portals.
- The supplier processes are normally completely manual, not supported by any IT or ERP system.
- Weak planning routines can cause disturbances in the packaging supply. This in turn can lead to production disturbances.
- Cost monitoring is difficult.

Through collective joint efforts within the industry, radical improvements can be achieved at all parties involved in handling returnable packaging.

1.2 Project goals and objectives

The following goals and objectives have been defined for the project:

- Describing and analysing current situation and improvement potentials regarding handling and administration of returnable packaging in the Automotive supply chain.
- Defining best practice processes and information exchange between business partners in the Automotive supply chain.
- Defining EDI concept for information exchange between business partners in the Automotive supply chain.
- Give influences and act as a reference group to the European packaging management project managed by Odette International.

1.3 Project scope and limitations

The project scope has been defined as:

- Analysing current situation, problems and improvement potentials regarding handling and administration of returnable packaging at Swedish suppliers in the Automotive industry.
- Describe and analyse current management principles for returnable packaging at main actors in the Swedish Automotive industry, i.e. Volvo Cars, Volvo Group, NEVS and Scania.
- Determine a process model with related stake holders that define the process flows and involved parties.
- Describe relevant supply chain scenarios for processing returnable packaging in the Automotive supply chain, according to the defined process model.
- Elaborate best practice processes for handling of returnable packaging. The prime focus has been on the collaboration between parties, not internal processes.
- Propose information exchange and EDI concept between the main stakeholders for handling of returnable packaging, according to the best practice processes.
- Give influences to the European packaging management project managed by Odette International.



The following project limitations have been defined related to processing and managing of returnable packaging:

- Processes not being main processes, are out of scope, e.g. deviation processes and deviation handling. It has been discussed. The decision is that it will be handled manually but it is not described in this process recommendation.
- Packaging processes related to spare parts supply are not included in the project.

- Transport processes are out of the project scope, as transport processes for packaging should be handled as other Automotive transports. (See result from the EIT project for recommended best practice transport processes.)
- The packaging material as such is not included. The business pain has been discussed, but no best practice proposals have been done.

1.4 Project organization and participation

The project has been organized by *NAF - Odette Sweden*, with participation from all Swedish main actors. *Tillväxtverket*, a Swedish agency for economic and regional growth, has partly founded the project.

In Table 1, the project organisation and the project participants are presented.

Company	Project member	Role
Odette Sweden	Ingrid Lundberg	Project management
Altiro	Jörgen Ljunggren	Project management
FKG	Leif Olsson	Project management
Volvo Group	Robert Bjeljac	OEM
Volvo Cars	Maria Waidele	OEM
NEVS	Göran Einevik	OEM
CJ Automotive	Fredrik Zetterström	Supplier
CJ Automotive	Tomas Lygnelid	Supplier
Leax	Åsa Norberg	Supplier
Bulten	Henrik Svennberg	Supplier
Nitator	Esbjörn Ljunggren	Supplier
Gnotec	Tomas Edvardsson	Supplier
Gestamp	Rikard Carlsson	Supplier
Levi Peterson	Erik Peterson	Supplier
Tyringe	Jörgen Erlandsson	Service provider

Table 1. *Project organisation and project participants.*

2 Project methodology

2.1 Project structure and time schedule

The project was conducted during the period from May to September 2015 and has been divided in five project phases. The five different project phases were:

- Phase 1 – Project initiation
- Phase 2 –Current situation
- Phase 3 –Best practice processes
- Phase 4 – EDI concept
- Phase 5 – Project finalising

The project time schedule is presented in Figure 1.

During the first project phase, *Project initiation*, the project management organized the project, by detailing the project plans and by inviting project participants.

Project activity	Week	20	21	22	23	24	25	26	27	Vacation	33	34	35	36	37	38	39	40	41
Phase 1 - Project initiation																			
Project planning		█	█	█	█	█	█	█	█										
Inviting project participants		█	█																
Meeting with OEMs				█	█	█	█	█	█										
Preparation - Kick off meeting				█	█	█	█	█	█										
Kick off meeting (web)					█	█	█	█	█										
Phase 2 –Current situation																			
Background research				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Preparation - Workshop 1				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Workshop 1									█	█	█	█	█	█	█	█	█	█	█
Completion and documentation after workshop 1									█	█	█	█	█	█	█	█	█	█	█
Follow-up meeting via web													█	█	█	█	█	█	█
Phase 3 –Best practice processes																			
Preparation - Workshop 2													█	█	█	█	█	█	█
Workshop 2													█	█	█	█	█	█	█
Completion and documentation after workshop 2														█	█	█	█	█	█
Follow-up meeting via web															█	█	█	█	█
Synchronization with European projects (VDA, Odette Int.)																			
Phase 4 – EDI concept																			
Preparation - Workshop 3																			
Workshop 3																			
Completion and documentation after workshop 3																			
Phase 5 – Project finalising																			
Project report - Tillväxtverket																			
Project report (word/ppt)																			
Follow-up meeting via web																			
Reporting to European project (Odette Int.)																			

Figure 1. Project time schedule.

The second project phase, *Current situation*, focused on analysing the current situation regarding handling and management of returnable packaging. Problems and improvement potentials were also discussed and analysed. The project management performed a survey and research work for preparing the workshop. The workshop result was compiled and documented after the workshop. Results and documentation was presented at a follow-up meeting via web.

The third project phase, *Best practice processes*, was dedicated to discussing and developing best practice processes for managing returnable packaging. The main activity during this phase was a two-day workshop. The project management prepared the workshop and finalized and documented the workshop result. A follow-up meeting was performed via web.

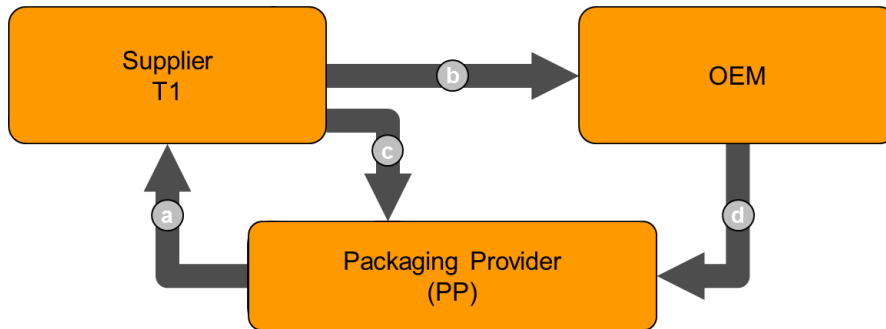


The fourth phase of the project, *EDI concept*, focused on developing a concept for information exchange and EDI, based on elaborated best practice processes. A full-day workshop was conducted to define the EDI concept. The project management prepared the workshop and finalized and documented the workshop result.

During the last project phase, *Project finalising*, the project management documented the project results, organised a project meeting to reconcile the project results with the team and reported the project to the external funder, Tillväxtverket.

2.2 Process and stake holder model

To illustrate and describe processes and information exchange related to management of returnable packaging, the project has defined an overall process and stake holder model. This model is presented in Figure 2.



Stake holder

Stake holder definition

OEM

Manufacturing facility. Receives components from suppliers, packed in packaging.

Supplier

Party that deliver components packed in packaging.

Packaging Provider

Unit that are offering returnable packaging. Normally this operation is a part of the OEM organisation but can also be an external company, e.g. CHEP, DHL, GEFICO.
The Packaging Provider includes operations as packaging pools, packaging delivery and transport planning, etc.



Physical flow.



Delivery of empty returnable packaging from Packaging Provider to Supplier.



Delivery of components packed in returnable packaging from Supplier to OEM.



Packaging returns from Supplier to Packaging Provider of damaged packaging or packaging that not are needed by the Supplier.



Packaging returns from OEM to Packaging Provider of empty (unoccupied) packaging.

Figure 2. *Process and stake holder model with definitions.*

The process model has been used during the project work to describe and illustrate current handling scenarios and to illustrate proposed best practice processes and recommended information exchange between involved supply chain parties.

3 Current situation and problems

The description and analysis of current situation related to handling and administration of returnable packaging consist of the following three parts:

- Description and analysis of current management principles (current situation) for returnable packaging at main actors in the Swedish Automotive industry, i.e. Volvo Cars, Volvo Group, NEVS and Scania.
- Description of supply chain scenarios where returnable packaging are used in the Automotive inbound supply chain.
- Analysis of problems and improvement potentials regarding handling and administration of returnable packaging at Swedish suppliers in the Automotive industry.

3.1 Packaging management principles at Swedish OEMs

The project has been studying actual management principles for returnable packaging at main actors in the Swedish Automotive industry, i.e. the Swedish OEMs.

The packaging management concept at NEVS (Saab):

- Own packaging material. Have earlier also been using packaging from CHEP.
- Have internally an integrated system portfolio and are using the push concept to replenish with packaging to the suppliers.
- Keeps stock balance of packaging items for the suppliers.
- Offers packaging with coverage time of five days, only to the T1 suppliers.
- Only deviations need to be handled by the suppliers.

The packaging management concept Scania:

- Own packaging material.
- Using the pull concept to replenish with packaging to the suppliers. Suppliers are ordering packaging items via a web portal.
- Do not keep stock balance of packaging items for the suppliers.

The packaging management concept at Volvo Cars:

- Own packaging material. Have earlier been using packaging services from Volvo Logistics (Volvo Group).
- Using the pull concept to replenish with packaging to the suppliers. Suppliers are ordering packaging items via a web portal.
- Keeps stock balance of packaging items for the suppliers.
- Offers packaging with coverage time of 21 days, only to the T1 suppliers.
- Suppliers order packaging and are reporting despatch via a web portal (based on proposed quantities).

The packaging management concept at Volvo Group:

- Own packaging material. Have earlier via the internal logistics service company (Volvo Logistics) been offering logistics and packaging service to external customers, e.g. Volvo Cars.
- Using the pull concept to replenish with packaging to the suppliers. Suppliers are ordering packaging items via a web portal.
- Keeps stock balance of packaging items for the suppliers.
- Offers packaging with coverage time of 21 days.
- Can offers packaging services to more companies than T1 suppliers – must be agreed in advance.
- Suppliers order packaging and are reporting despatch via a web portal.

3.2 Packaging supply chain scenarios

Several scenarios occur where returnable packaging are used in the Automotive supply chain.

Current project has identified five different scenarios where returnable packaging is used in the Automotive inbound supply chain. The handling scenarios have been illustrated according to the process model (see section 2.2) and are presented in Figure 3.

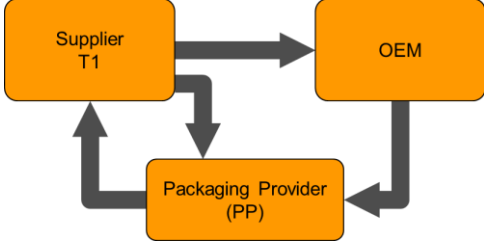
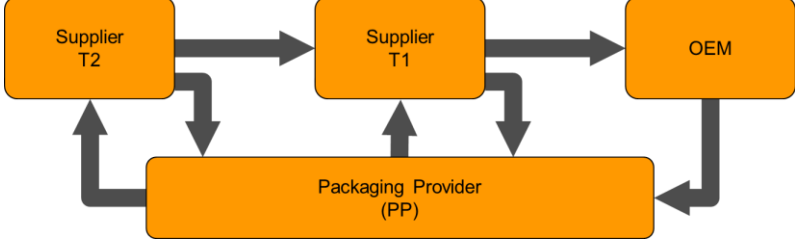
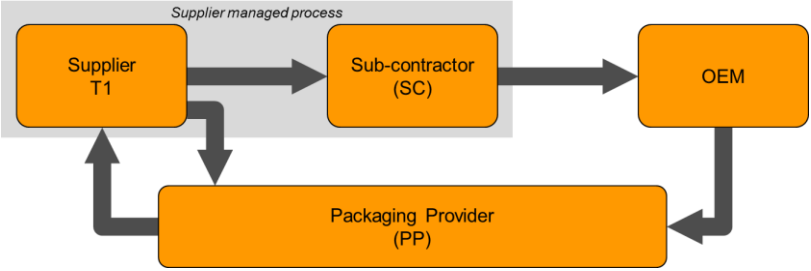
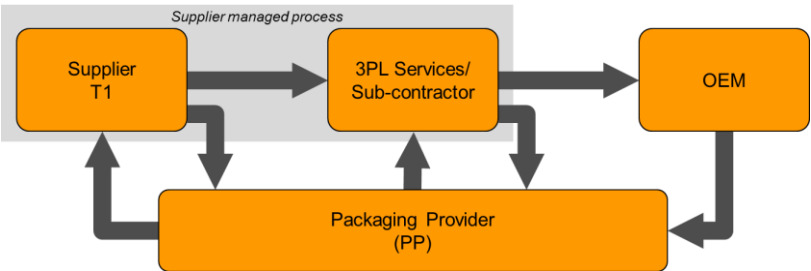
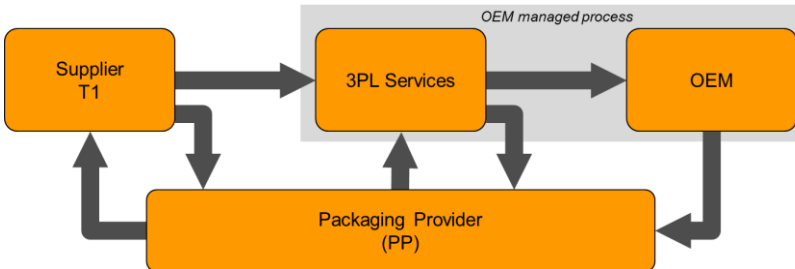
Scenario description	Scenario illustration
<p>1 Returnable packaging flow between</p> <ul style="list-style-type: none"> • Packaging Provider • T1 Supplier • OEM 	
<p>2 Returnable packaging flow between</p> <ul style="list-style-type: none"> • Packaging Provider • T2 Supplier • T1 Supplier • OEM 	
<p>3 Returnable packaging flow between</p> <ul style="list-style-type: none"> • Packaging Provider • T1 Supplier • Sub-contractor, suppl. managed • OEM <p>Remark: The same packaging is used when the articles are delivered to and from the Sub-contractor.</p>	
<p>4 Returnable packaging flow between</p> <ul style="list-style-type: none"> • Packaging Provider • T1 Supplier • 3PL, supplier managed or Sub-contractor, suppl. managed • OEM <p>Remark: Repacking can be done at 3PL/Sub-contractor.</p>	
<p>5 Returnable packaging flow between</p> <ul style="list-style-type: none"> • Packaging Provider • T1 Supplier • 3PL (OEM managed) • OEM <p>Remark: Repacking can be done at 3PL.</p>	

Figure 3. Different scenarios where returnable packaging is used in the Automotive inbound supply chain.

3.3 Problems and improvement potentials

The project have been analysing the business pains and improvement potentials related to handling and administration of returnable packaging at suppliers in the Automotive industry. Appendix 1 contains a matrix that presents the problems and improvement potentials.

A summary of identified problems are presented below:

- Duplication of work and risk of system deviations due to lack of packaging instructions integration of the OEM and supplier systems.
- The planning processes are normally manual at suppliers, which entails in weak precision and resource intensive processes. Suppliers have full time employees that are working with packaging administration and reporting via different web portals.
- Due to weak and manual processes, extensive stock balance deviations occur. This in turn can lead to production disturbances. This also enforces extensive investigations by the supplier to be able to explain the deviations and avoid paying the fee for lost packaging.
- Improper handling during the transport process, due to lack of labelling of the transport units – sent to and unloaded at wrong receiver.
- When OEM packaging cannot be used via sub-contractors, additional process steps need to be added. Material needs to be shipped back to the supplier, being repacked and finally shipped to the OEM.
- The packaging material as such is also a problem because each OEM has it owns packaging. The fact that some OEM's just allow tier1 as a packaging user is not helping the situation. The consequences are further more types of packaging, systems and tools.

A summary of identified improvements are presented below:

- Defining and implementing of best practices for packaging handling.
- Replacing manual reporting via web portals with automatic EDI transactions.
- The packaging transport units should be labelled with a transport label.
- The material despatch advice should also describe the packaging items. A variant of the despatch advice can be needed, that just describe the delivered packaging.
- The transport label should carry information about the packaging items.

Details about current situation, problems and improvement potentials can be found in Appendix 1.

4 Best practice for returnable packaging

Based on the process model, the project has elaborated best practice processes for the main processes for administration and handling of returnable packaging.

The following processes have been focused:

Process	Description
1 Packaging replenishment planning	Two variants of processes have been defined for replenishment planning of packaging.
2 Packaging delivery	Delivery of empty packaging from Packaging Provider.
3 Material delivery (inclusive packaging)	Delivery of material packed in returnable packaging.
4 Packaging return	Return delivery of empty packaging to Packaging Provider.

Table 2. *Main processes that have been focused by the project.*

A main prerequisite for our best practice recommendation is that packaging items shall be treated as normal items from an IT system and planning perspective.

There are two main principles used for the planning of returnable package today:

- Pull – The packaging user (supplier) are planning and ordering.
- Push – Packaging provider refills to the party that needs to use the packaging.

The project does not recommend which concept to use (pull vs. push), although the pull concept is the most common concept today. The process descriptions include best practice descriptions for both the pull and the push concepts.

Deviation processes are not described in this process recommendation.

Each main process is described below. A condensed version of the best practice processes are presented in Appendix 2.

4.1 Best practice – Packaging replenishment planning

The project has defined two different planning concepts, *Pull Planning* and *Push Planning*. Depending on replenishment concept used, we will have two different planning processes.

4.1.1 Pull planning

The process steps for *Pull Planning* are described below.

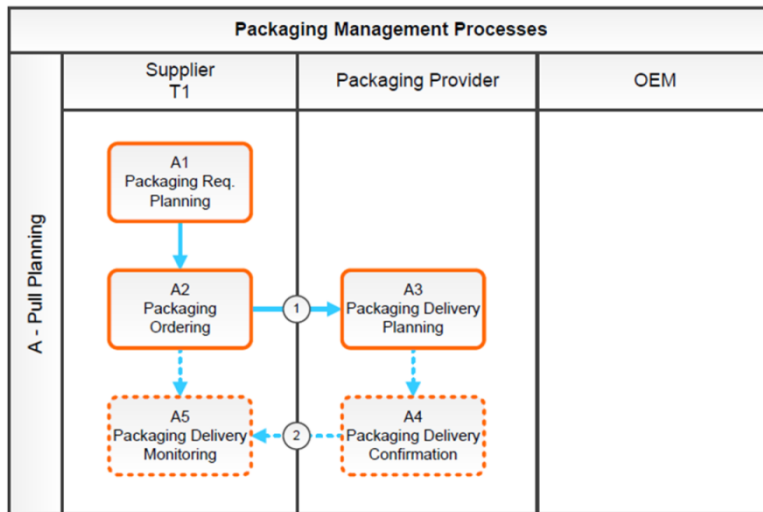


Figure 4. Process flow for Pull Planning.

A1 Packaging Requirements Planning

The packaging items shall be treated as normal items. Packaging requirements are calculated at the Supplier by MRP (Material Requirement Planning). In some cases additional planning applications can be needed to create a suitable packaging plan.

A2 Packaging Ordering

Supplier orders packaging from Packaging Provider via an EDI Order. An alternative ordering concept is an EDI Delivery Schedule (not preferred).

A3 Packaging Delivery Planning

Delivery planning of packaging shall be done according to packaging availability at the Packaging Provider and according to the transport arrangements for shipping packaging to the receiver.

A4 Packaging Delivery Confirmation (dependent)

If packaging ordering has been carried out through an Order the planned packaging delivery shall be confirmed via an Order Confirmation via EDI.

A5 Packaging Delivery Monitoring (dependent)

If the planned packaging delivery is confirmation via an Order Confirmation, the Supplier can monitor if the confirmed packaging delivery will fulfil the packaging demand at the Supplier.

4.1.2 Push planning

The process steps for *Push Planning* are described below.

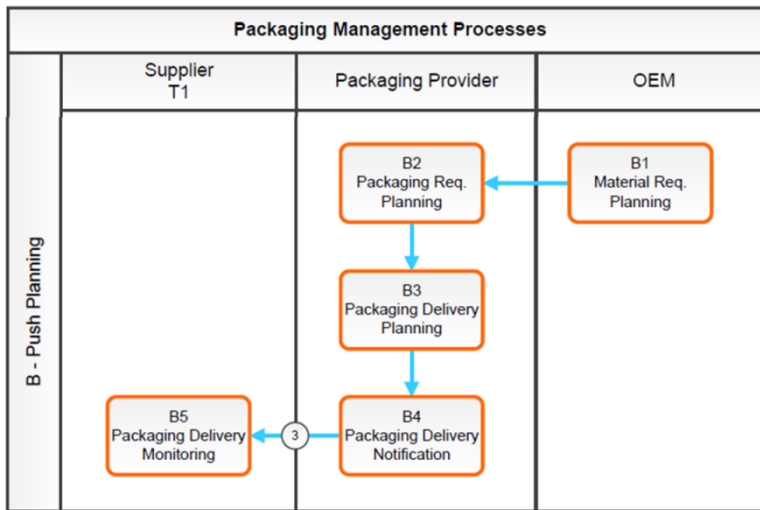


Figure 5. Process flow for Push Planning.

B1 Material Requirements Planning

Material requirements (usually calculated by MRP) are normally communicated to the Supplier via a delivery schedule. The same source of demand shall be shared to the Packaging Provider for calculation of packaging requirements.

B2 Packaging Requirements Planning

Based on the material demand and actual on hand packaging balances packaging items at the Supplier; the Packaging Provider calculates the packaging replenishment by MRP.

B3 Packaging Delivery Planning

Delivery planning of packaging shall be done according to packaging availability at the Packaging Provider and according to the transport arrangements for shipping packaging to the receiver.

B4 Packaging Delivery Notification

The planned packaging delivery shall be notified to the Supplier via an EDI Order.

B5 Packaging Delivery Monitoring

The Supplier can monitor if the planned packaging delivery will fulfil the packaging demand at the Supplier.

4.2 Best practice – Packaging delivery

The process steps for deliveries of empty packaging are described below.

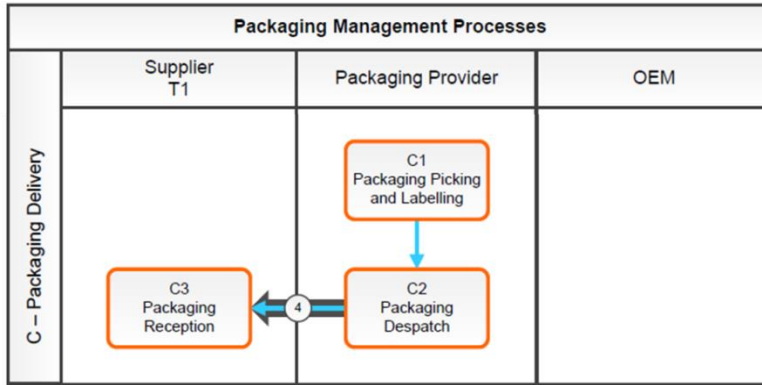


Figure 6. Process flow for Packaging Delivery.

C1 Packaging Picking and Labelling

Packaging that will be shipped from the Packaging Providers are picked and labelled with a transport label, according to the Odette labelling standard.

C2 Packaging Despatch

At despatch of the packaging, the Packaging Provider shall issue a *Packaging Despatch Advice* to the receiver (the Supplier).

C3 Packaging Reception

Reception of packaging at the Supplier shall be handled as ordinary goods receptions (receptions for materials).

4.3 Best practice – Material delivery (inclusive packaging)

The process steps for material deliveries packed in returnable packaging are described below.

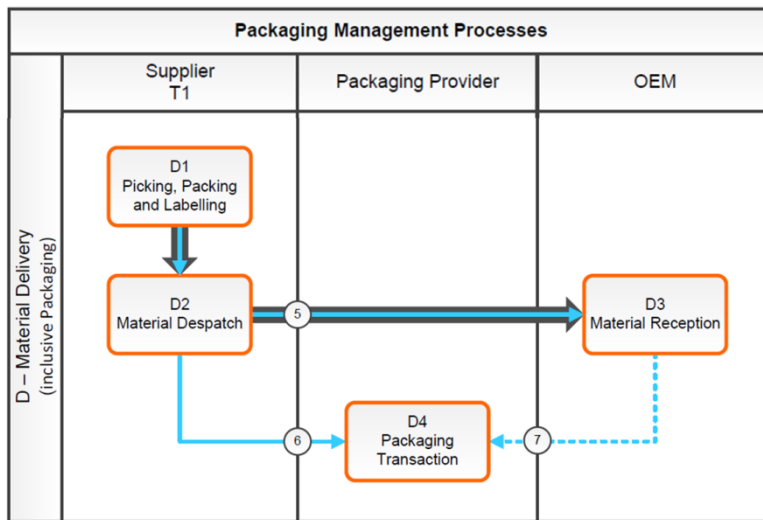


Figure 7. Process flow for Material Delivery (inclusive packaging).

D1 Picking, Packing and Labelling

Materials that will be shipped are picked and labelled with a transport label, according to the Odette labelling standard. In some cases also packing are done just before despatch.

D2 Material Despatch

At despatch of the materials the Supplier shall issue a Material Despatch Advice to the Customer (OEM). This message shall contain information of shipped materials and shipped packaging.

A copy of the Material Despatch Advice or a Packaging Despatch Advice shall also be sent to the Packaging Provider.

D3 Material Reception

At goods reception, not only the received quantity of materials shall be verified; also the received quantity of packaging shall be verified.

A Packaging Receipt Report, containing information about received packaging, can be sent to the Packaging Provider.

D4 Packaging Transaction

The Packaging Provider is updating stock balances when the packaging is relocated between the different parties, according to the Dispatch Advice and Receipt Report messages.

4.4 Best practice – Packaging return

The process steps for *Packaging Return* are described below.

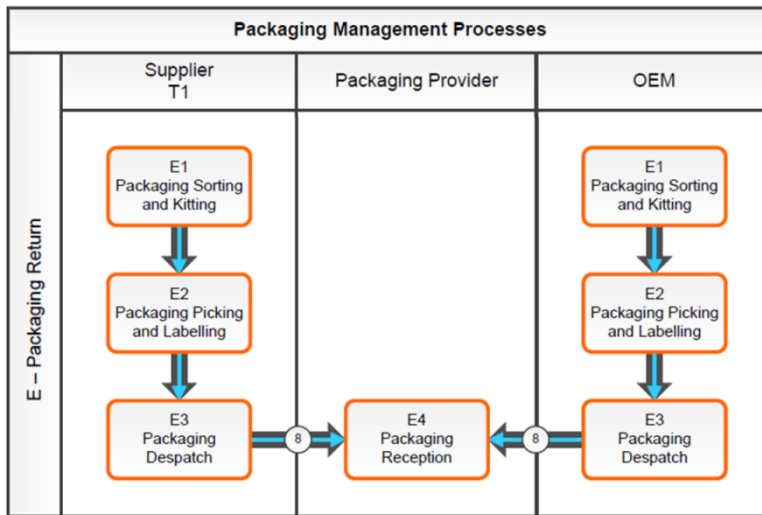


Figure 8. Process flow for Packaging Return.

E1 Packaging Sorting and Kitting

When the packaging are unpacked at the customer, broken and approved, packaging shall be sorted. The packaging shall also be packed according to the packing instruction for empty packaging.

E2 Packaging Picking and Labelling

Packaging that will be shipped are picked and labelled with a transport label, according to the Odette labelling standard.

E3 Packaging Despatch

At despatch of the packaging, the sender shall issue a Packaging Despatch Advice to the receiver (the Packaging Provider).

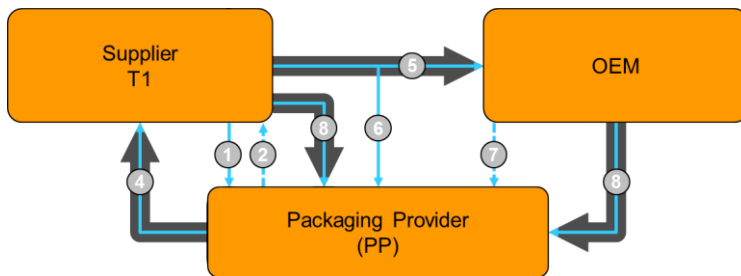
E4 Packaging Reception

The Packaging Provider receives the returned packaging. The physical reception shall be reconciled against the Despatch Advice.

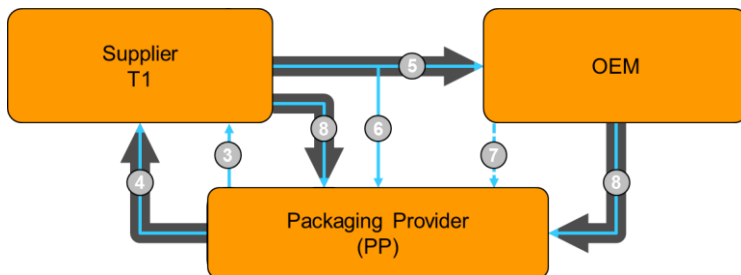
4.5 Information exchange between parties

Depending on what replenishment concept that is used we will have different information scenarios between the parties, see Figure 9, below.

Information exchange at Pull Planning



Information exchange at Push Planning



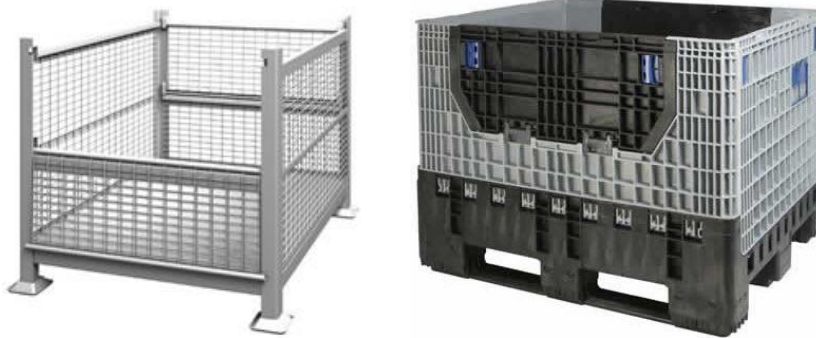
ID	Type of information exchange	EDI message	Other
1	Ordering of packaging	ORDERS (DELFOR)	
2	Confirmation of planned packaging delivery (dependent – ordering via an order).	ORDRESP	
3	Notification of planned packaging delivery	ORDERS	
4	Despatch of empty packaging. Transport handling units of packaging shall be labelled with a transport label according to the Odette standard. A <i>Packaging Despatch Advice</i> shall be sent from the PP to the receiver.	DESADV	Transport label
5	Despatch of material packed in returnable packaging. Labelling of transport handling units and underlying package items according to the Odette standard. A <i>Material Despatch Advice</i> shall be sent from the Supplier to the Customer (OEM).	DESADV	Transport label
6	At despatch of material packed in returnable packaging, a copy of the <i>Material Despatch Advice</i> or a <i>Packaging Despatch Advice</i> shall be sent to the PP.	DESADV	
7	At goods reception, a <i>Packaging Receipt Report</i> , containing information about of received packaging, can be sent to the PP (optional).	RECADV	
8	Return despatch of empty packaging. Transport handling units of packaging shall be labelled with a transport label according to the Odette standard. A <i>Packaging Despatch Advice</i> shall be sent from the sender to the PP.	DESADV	Transport label

Figure 9. Information exchange between parties at Pull and Push Planning.

4.6 Information exchange for different supply chain scenarios

In section 3.2 different scenarios are presented where returnable packaging are used in the Automotive inbound supply chain. The project has also been analysing if the proposed best practice concept can support the different supply chain scenarios.

The conclusion is that the proposed best practice concept supports different handling scenarios where returnable packaging are used in the inbound Automotive supply chain. In Appendix 3 the different supply chain scenarios are presented.



5 EDI concept

The project has defined an overall concept for the EDI application for exchange of business messages related to returnable packaging. The proposed concept for EDI exchange is presented in Section 4.4.

For the *Material Despatch Advice* (delivery of the materials), packaging shall be specified in the PAC segment for each packaging item. In the *Packaging Despatch Advice* (delivery of just packaging items), the packaging is handled as "normal components", which in this case means that the packaging shall be listed as items in the LIN segment. The packaging that is used as a load carrier shall be specified in the PAC segment.

Appendix 4 contains an information model that describes the information content per EDI message. The EDI information model must just be seen as a draft, as the project has not fully been able to analyse and verify data model.

The packaging project within Odette International should further explore how packaging can best be described in the DESADV message.

Problems and improvement potentials

The project has been analysing the problems and improvement potentials related to packaging handling. The result is presented in the matrix below.

ID	Area	Description – Current situation	Description – Current problems	Proposed improvements
1.	Packaging instruction	Packing instructions are available as basic data in different local systems. Systems at OEMs and suppliers for packing instructions are not integrated.	<p>a: Duplication of work, as system updates needs to be done in several local systems.</p> <p>b: Obvious that deviations can occur between the local systems for packaging instructions. Wrong packaging instructions will result in wrong ordering, wrong packaging/shipping and stock balance deviations.</p>	<p>Systems interface and data format to export and import packaging instructions.</p> <p>In the future, suppliers and customers might be using the same cloud system for packaging instructions.</p>
2.	Packaging planning	<p>There are two main principles used for the planning of returnable packaging today:</p> <ul style="list-style-type: none"> • Pull – The packaging user (supplier) are planning and ordering. • Push – Packaging provider refills to the party that needs to use the packaging. The Push concept is used by NEVS/Saab. <p>Packaging can be planned in a manner similar to other materials.</p> <p>The following planning principles exist:</p> <ul style="list-style-type: none"> • MRP – Packaging instructions can be registered in the BoM in the ERP. ERP system will than calculate the replenishment demands. • Kanban – Packaging circulating between the parties. Empty containers are the signal for refilling with material. • Circulation of packaging between the parties, without any planning operation. Can only be used for special packaging, which is circulated between a limited numbers of parties. • Manual stocktaking and planning. 	It is very common with manual planning processes at suppliers, which both have a lack of precision and are resource intensive.	Defining and implementation of best practices for packaging planning.

ID	Area	Description – Current situation	Description – Current problems	Proposed improvements
3.	Packaging ordering	Normally is packaging ordered via a web portal, unique per packaging provider.	Resource intensive. Suppliers have full time employees that are working with packaging administration and reporting via different web portals.	Defining and implementation of best practices for packaging ordering. Ordering should be done via an automated EDI-process.
4.	Delivery of empty packaging	Deliveries of empty packaging are normally sent by truck as: <ul style="list-style-type: none"> • Direct deliveries with full truck loads • Milk round transports to several receivers • Cross dock transports 	a: Common that the Packaging Providers are not able to deliver the ordered quantity and that no delivery notification is sent to the supplier. b: Improper handling during the transport process due to lack of labelling of the transport units – sent to and unloaded at wrong receiver. c: Suppliers are not performing a proper goods reception. Consequences of these failures are that the stock balance figures will be wrong.	Defining and implementation of best practices for packaging delivery of empty packaging. An EDI despatch advice should be sent to the receiver at despatch of empty packaging. The packaging transport unit should be labelled with a transport label.
5.	Delivery of material, packed in returnable packaging	Suppliers are normally reporting stock issue of packaging items via a web portal at despatch.	Resource intensive to report despatch of packaging items via web portals.	Defining and implementation of best practices for packaging handling at material delivery (packed in returnable packaging). The despatch advice should describe the packaging items. Also a variant of the despatch advice can be needed, that just describe the delivered packaging. The transport label should be updated with the packaging items.

Date
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Issued by
Ingrid Lundberg
Jörgen Ljunggren

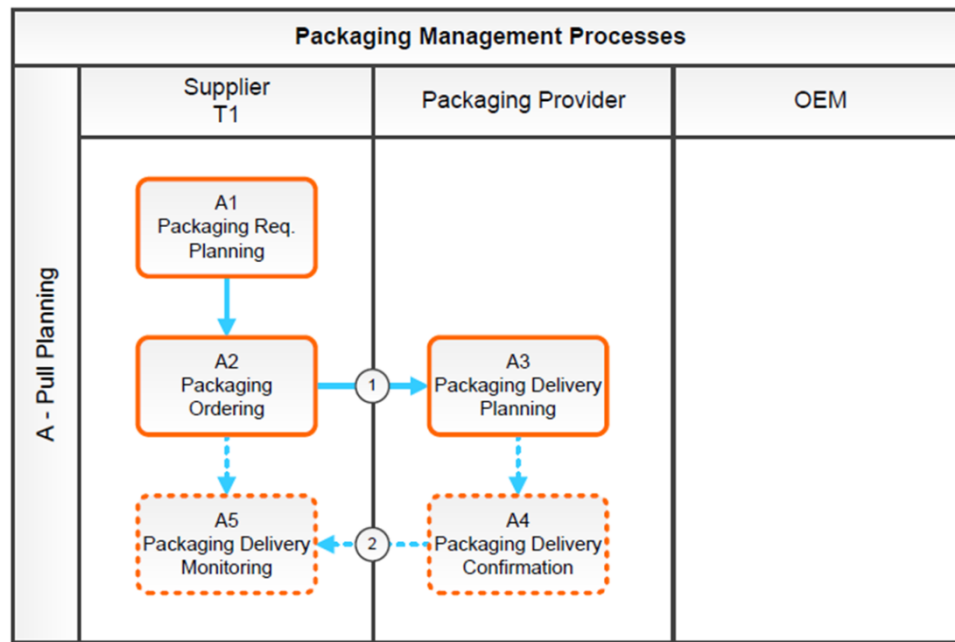
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ID	Area	Description – Current situation	Description – Current problems	Proposed improvements
6.	Goods reception of material	The receiving party are normally not checking and verifying the packaging items at goods reception.	Differences in the packaging balance can occur if the reported quantity deviates from the actual.	Defining and implementation of best practices for packaging handling at goods reception. At goods reception at the receiver, the packaging should also be verified and "received".
7.	Usage of packaging up-streams in the supply chain	Packaging owned by an OEM can normally not be used upstream in the supply chain.	Many suppliers are forced to invest in own packaging and establishing processes for packaging management.	
8.	Sub-contractor	Some OEM allows the packaging to be used in the relation with sub-contractors, others do not.	When OEM packaging cannot be used via sub-contractors, additional process steps needs to be added. Material needs to be shipped back to the supplier, being repacked and finally shipped to the OEM.	Sub-contractors should be allowed packaging users.

Best practice description for returnable packaging

The project has elaborated best practice processes for the main processes for administration and handling of returnable packaging. A condensed version of the best practice processes are presented below.

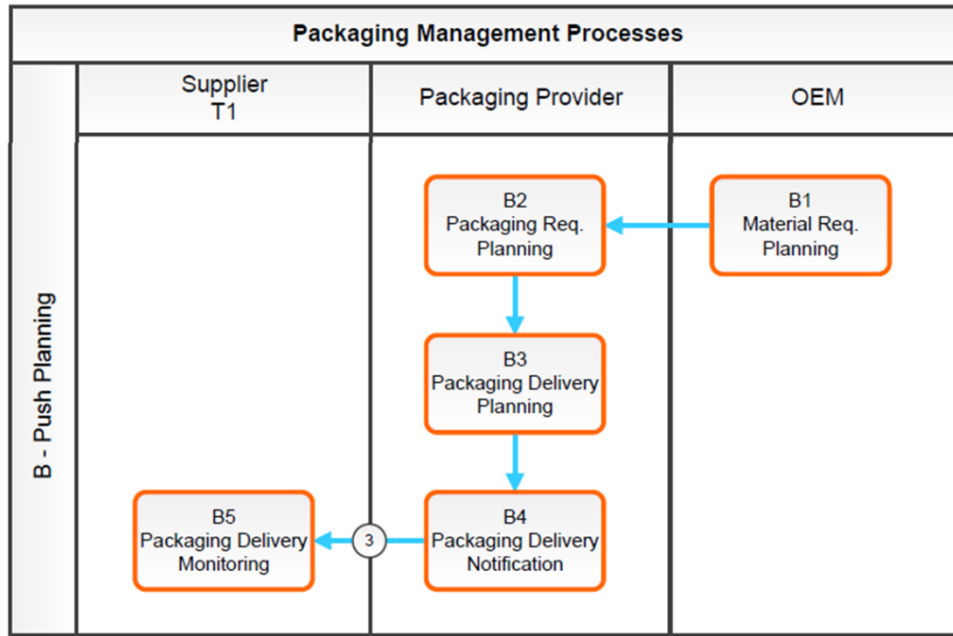
A Pull Planning



Information flow → Physical flow

Process steps	
A1	Packaging Requirements Planning The packaging items must be treated as normal items. Packaging requirements are calculated at the Supplier by MRP (Material Requirement Planning). In some cases additional planning applications can be needed.
A2	Packaging Ordering Supplier orders packaging from Packaging Provider via <ul style="list-style-type: none"> • an Order (preferred) or • a Delivery Schedule.
A3	Packaging Delivery Planning Delivery planning of packaging must be done according to packaging availability and according to the transport arrangements.
A4	Packaging Delivery Confirmation (dependent) If packaging ordering has been carried out through an <i>Order</i> the planned packaging delivery shall be confirmed via an <i>Order Confirmation</i> .
A5	Packaging Delivery Monitoring (dependent) If the planned packaging delivery is confirmation via an <i>Order Confirmation</i> , the Supplier can monitor if the confirmed packaging delivery will fulfil the packaging demand at the Supplier. Deviations are not described in this recommendation.
Information exchange	
1	Order or Delivery Schedule via EDI.
2	Order Confirmation via EDI (dependent).

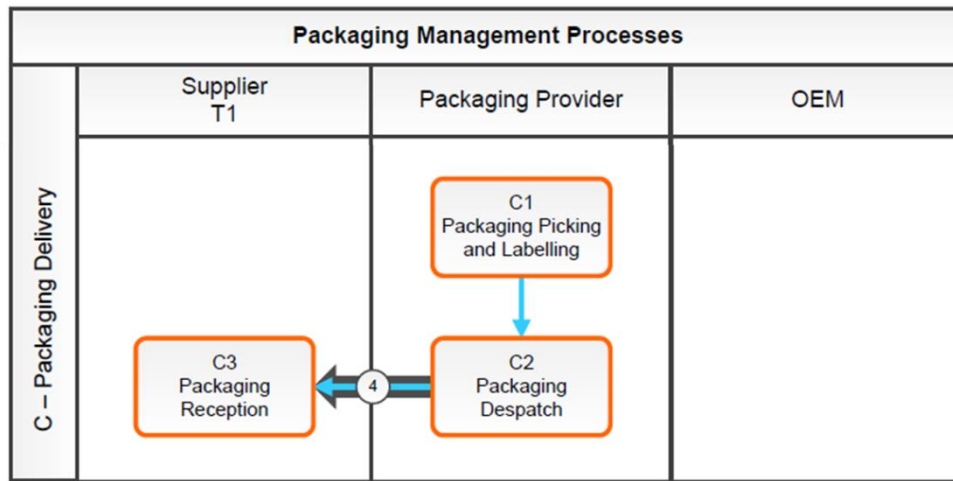
B Push Planning



Information flow Physical flow

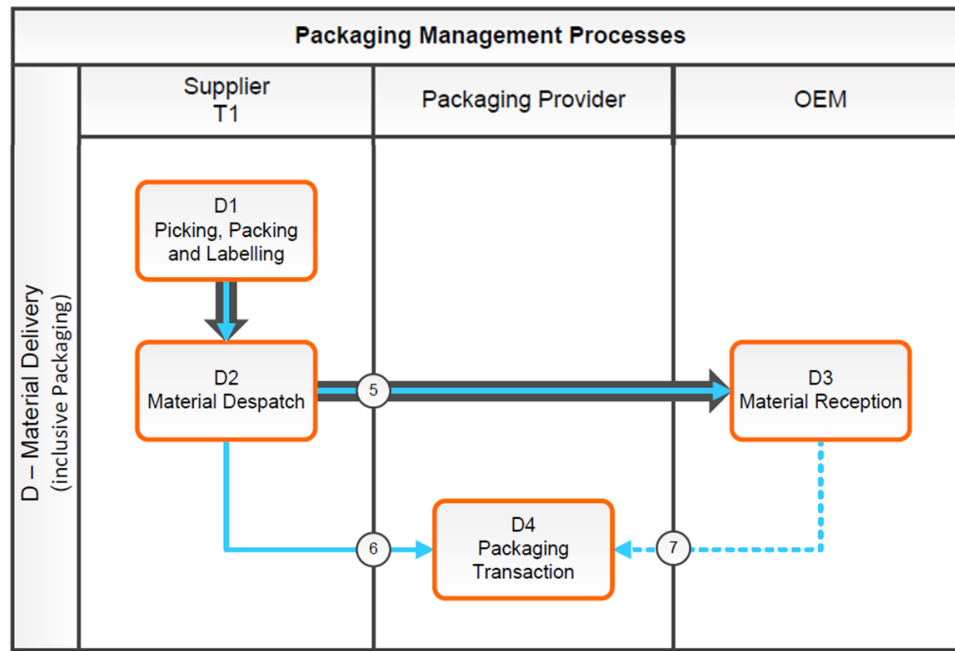
Process steps	
B1	<p>Material Requirements Planning Material requirements (usually calculated by MRP) are normally communicated to the Supplier via a delivery schedule. The same source of demand shall be shared to the Packaging Provider for calculation of packaging requirements.</p>
B2	<p>Packaging Requirements Planning Based on the material demand and actual on hand packaging balances at the Supplier, the Packaging Provider calculates the packaging replenishment by MRP.</p>
B3	<p>Packaging Delivery Planning Delivery planning of packaging shall be done according to packaging availability and according to the transport arrangements.</p>
B4	<p>Packaging Delivery Notification The planned packaging delivery shall be notified to the Supplier.</p>
B5	<p>Packaging Delivery Monitoring The Supplier can monitor if the planned packaging delivery will fulfil the packaging demand at the Supplier. Deviations are not described in this recommendation.</p>
Information exchange	
3	Order via EDI.

C Packaging Delivery



Process steps	
C1	Packaging Picking and Labelling Packaging that will be shipped are picked and labelled with a transport label, according to the Odette labelling standard.
C2	Packaging Despatch At despatch of the packaging, the Packaging Provider shall issue a <i>Packaging Despatch Advice</i> to the receiver (the Supplier).
C3	Packaging Reception Reception of packaging at the Supplier shall be handled as ordinary goods receptions (receptions for materials).
Information exchange	
4	Packaging Despatch Advice via EDI.

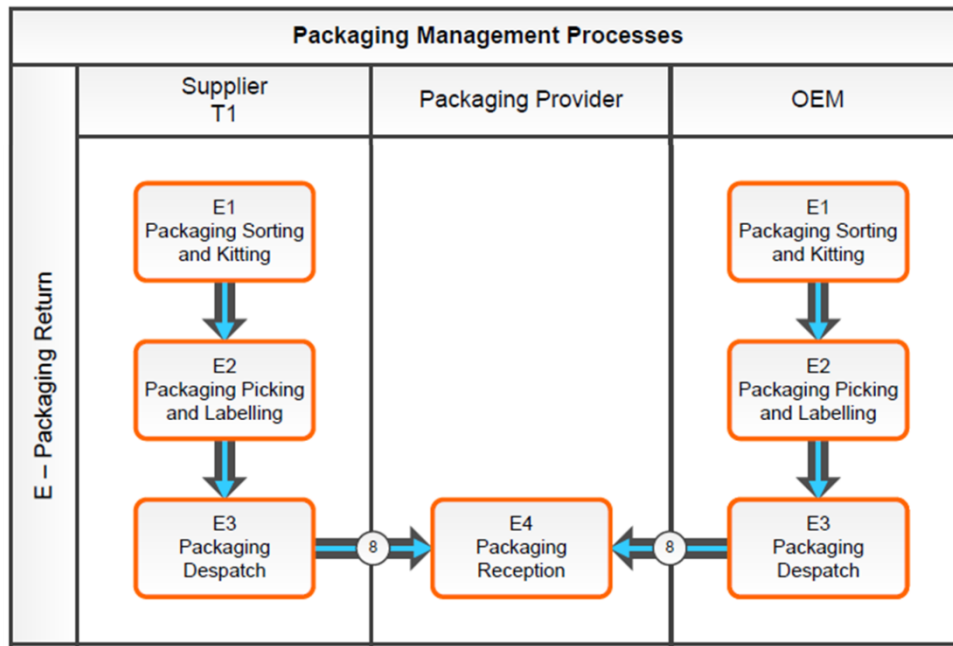
D Material Delivery (inclusive Packaging)



Information flow Physical flow

Process steps	
D1	Picking, Packing and Labelling Materials that will be shipped are picked and labelled with a transport label, according to the Odette labelling standard. In some cases also packing are done just before despatch.
D2	Material Despatch At despatch of the materials the Supplier shall issue a <i>Material Despatch Advice</i> to the Customer (OEM). This message shall contain information of shipped materials and shipped packaging. A copy of the <i>Material Despatch Advice</i> or a <i>Packaging Despatch Advice</i> shall also be sent to the Packaging Provider.
D3	Material Reception At goods reception, not only the received quantity of materials shall be verified; also the received quantity of packaging shall be verified. A <i>Packaging Receipt Report</i> , containing information about the received packaging, can be sent to the Packaging Provider.
D4	Packaging Transaction The Packaging Provider is updating stock balances when the packaging are relocated, according to the <i>Dispatch Advice</i> and <i>Receipt Report</i> messages.
Information exchange	
5	Material Despatch Advice via EDI.
6	Material/Packaging Despatch Advice via EDI.
7	Packaging Receipt Report via EDI (optional).

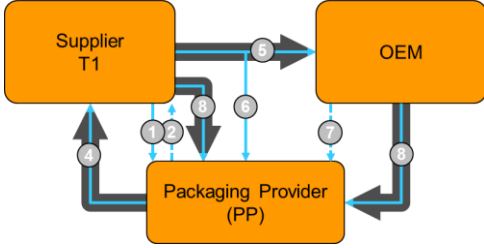
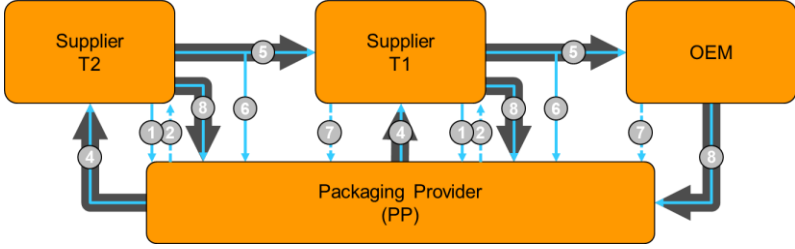
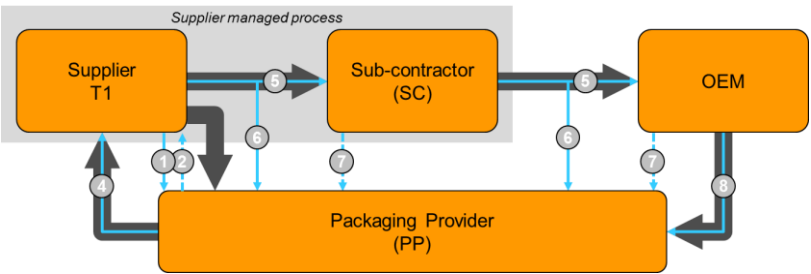
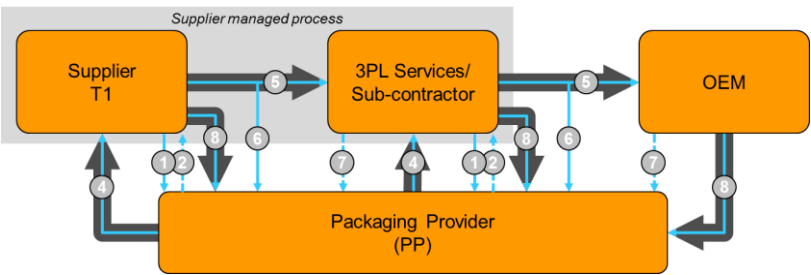
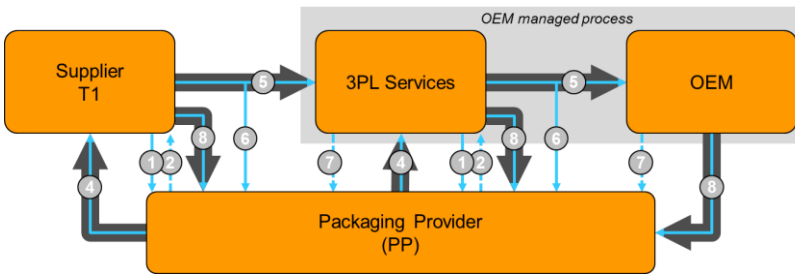
E Packaging Return



Process steps	
E1	Packaging Sorting and Kitting When packaging are unpacked, broken and approved packaging shall be sorted and packed according to the packaging packing instruction.
E2	Packaging Picking and Labelling Packaging that will be shipped are picked and labelled with a transport label, according to the Odette labelling standard.
E3	Packaging Despatch At despatch of the packaging, the sender shall issue a <i>Packaging Despatch Advice</i> to the receiver (the Packaging Provider).
E4	Packaging Reception The Packaging Provider receives the returned packaging. The physical reception shall be reconciled against the <i>Despatch Advice</i> .
Information exchange	
8	Packaging Despatch Advice via EDI

Information exchange for different supply chain scenarios

The project has been analysing scenarios where returnable packaging are used in the supply chain. Furthermore, the project has been analysing if the proposed best practice concept can support the different supply chain scenarios, see below. The conclusion is that the proposed best practice concept supports packaging handling scenarios.

Scenario description	Scenario illustration
<p>1 Returnable packaging flow between</p> <ul style="list-style-type: none"> • Packaging Provider • T1 Supplier • OEM 	
<p>2 Returnable packaging flow between</p> <ul style="list-style-type: none"> • Packaging Provider • T2 Supplier • T1 Supplier • OEM 	
<p>3 Returnable packaging flow between</p> <ul style="list-style-type: none"> • Packaging Provider • T1 Supplier • Sub-contractor, suppl. managed • OEM <p>Remark: The same packaging is used when the articles are delivered to and from the Sub-contractor.</p>	
<p>4 Returnable packaging flow between</p> <ul style="list-style-type: none"> • Packaging Provider • T1 Supplier • 3PL, supplier managed or Sub-contractor, suppl. managed • OEM <p>Remark: Repacking can be done at 3PL/Sub-contractor.</p>	
<p>5 Returnable packaging flow between</p> <ul style="list-style-type: none"> • Packaging Provider • T1 Supplier • 3PL (OEM managed) • OEM <p>Remark: Repacking can be done at 3PL.</p>	

ID	Type of information exchange	EDI message	Other
1	Ordering of packaging	ORDERS (DELFOR)	
2	Confirmation of planned packaging delivery (dependent – ordering by using an order).	ORDRESP	
4	Despatch of empty packaging. Transport handling units of packaging must be labelled with a transport label according to the Odette standard. <i>A Packaging Despatch Advice</i> must be sent from the Packaging Provider to the receiver.	DESADV	Transport label
5	Despatch of material packed in returnable packaging. Labelling of transport handling units and underlying package levels according to the Odette standard. <i>A Material Despatch Advice</i> must be sent from the Supplier to the Customer (OEM).	DESADV	Transport label
6	At despatch of material packed in returnable packaging, also a copy of the <i>Material Despatch Advice</i> or <i>Packaging Despatch Advice</i> must also be sent to the Packaging Provider.	DESADV	
7	At goods reception, a <i>Packaging Receipt Report</i> , containing information about of received packaging, can be sent to the Packaging Provider.	RECADV	
8	Return despatch of empty packaging. Transport handling units of packaging shall be labelled with a transport label according to the Odette standard. <i>A Packaging Despatch Advice</i> must be sent from the sender to the Packaging Provider.	DESADV	Transport label

EDI information model

The EDI information model presented below shall just be seen as a draft, as the project has not fully been able to analyse and verify the data model.

	DELFOR	ORDERS	ORDRSP	DESADV	RECADV
M – Mandatory data O – Optional data					
Partner					
Message sender	M	M	M	M	M
Message receiver	M	M	M	M	M
Ship from	O	O	O	M	O
Loading point	-	-	O	O	O
Ship to	M	M	M	M	M
Unloading point	M	M	M	M	M
Buyer	M	M	M	O	O
Seller	M	M	M	O	O
Carrier	-	-	O	O	O
Date/Time					
Message date	M	M	M	M	M
Requested delivery date	M	M	O	-	O
Confirmed delivery date	-	-	M	-	-
Goods receiving date	-	-	-	-	M
References					
Message number	M	M	M	M	M
Shipment ID (assigned by ship-from)	-	-	-	O	O
Delivery note number	-	-	-	M	M
Latest received delivery note number	O	-	-	-	-
Order number	M	M	M	M	O
Transport ID (customer assigned)	-	-	-	O	O
Transport order number	-	-	-	O	O
Goods item information					
Package type code (bundle or handling unit)	-	-	-	M	M
Number of handling units	-	-	-	M	M
Handling unit shipping ID (license plate)	-	-	-	M	M
Package type code (individual PM or PHM)	-	-	-	O	O
(Packaging) article number	M	M	M	M	M
Volume	-	-	-	O	-
Gross	-	-	-	O	-
Length, width, height	-	-	-	O	-
Quantities					
Delivery quantity per package type	-	-	-	M	M
Ordered quantity	M	M	O	-	-
Confirmed quantity	-	-	M	-	-
Received quantity (ok)	-	-	-	-	M
Damaged quantity	-	-	-	-	O
Missing quantity	-	-	-	-	O
Remark for wrongly received packages ...	-	-	-	-	O
Cumulative received quantity	O	-	-	-	-
Cumulative received date(in the date segment)	O	-	-	-	-
Total delivered quantity	-	-	-	-	M
Status information					
Order/plan indicator	M	-	-	-	-