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# GLOSSARY:

|  |  |
| --- | --- |
| **API** | Application Programming Interface |
| **ASN** | Advanced Shipping Notification |
| **B2B** | Business-to-Business |
| **BI** | Business Intelligence. This refers to SAP BI platform. |
| **BODS** | Business Oriented Data Service |
| **BTO** | Buy To Order |
| **BW** | Business Warehouse. This refers to SAP BW/BI platform |
| **CRM** | Customer Relationship Management |
| **DB** | Database |
| **DK** | Country code for Denmark |
| **DMT** | Discount Management Tool. It’s a custom built tool for price calculation. |
| **ECC** | ERP Central Component |
| **EDI** | Electronic Data Interchange |
| **EES** | Employee Expense System |
| **EMT Admin** | EMT Admin is a tool used to manage the partners, configurations and mapping parameters required by SAP PI in order to convert and handle different document formats sent by the partners (customer and vendors). |
| **EPIServer** | Software company provides cloud based digital commerce, personalization and content management technology. Solar uses the commerce platform for its new Webshop. |
| **ERP** | Enterprise Resource Planning |
| **EWM** | Extended Warehouse Management. It refers to SAP EWM warehouse management packaged software. |
| **FDM** | File Distribution Management. This is custom built tool. |
| **FTP** | File Transfer Protocol |
| **GDPR** | General Data Protection Regulation |
| **GR** | Goods Received |
| **GUI** | Graphical User Interface |
| **HR** | Human Resources |
| **IAM** | Identity and Access Management |
| **IBX** | IBX or IBX Connect is an e-procurement platform |
| **ICF** | Internet Communication Framework |
| **ICM** | Internet Communication Manager |
| **IDOC** | Intermediate Document (Document generated from SAP) |
| **INV** | Invoice |
| **JDE** | Oracle JD Edwards Suite |
| **JSON** | JavaScript Object Notation |
| **LOB** | Line of Business |
| **LW** | Label Writer |
| **MAG 45** | Integrated supply chain solutions company. <https://www.mag45.com>. |
| **MDM** | Master Data Management. This refers to in-house built MDM tool. |
| **MFC** | Material Flow Control |
| **MFS** | Material Flow System |
| **NESUBL** | Northern European Subset Universal Business Language |
| **NL** | Country code for Netherland |
| **P2P** | Procure to Pay Cycle |
| **PI** | Process Integration. This refers to SAP PI tool. |
| **PIM** | Product Information Management |
| **PL** | Country Code for Poland |
| **PO** | Purchase Order |
| **POD** | Proof of Delivery |
| **PPM** | Project Portfolio Management |
| **PPS** | Project Plan Services. This is used in context of Telenor Project Handling Services. |
| **REST** | Representational State Transfer |
| **RFC** | Remote Function Call |
| **SAP** | Systems Applications Products |
| **SE** | Country code for Sweden |
| **SF** | Salesforce |
| **SFDC** | SalesForce Dot Com |
| **SGS** | SGS is a warehouse management system used by Solar. |
| **SMTP** | Simple Mail Transfer Protocol |
| **SO** | Sales Order |
| **SOA** | Service-Oriented Architecture |
| **SOAP** | Simple Object Access Protocol |
| **SP** | Shipping Process |
| **SSIS** | SQL Server Integration Services |
| **SSO** | Single sign-on |
| **SSP** | Single Source Platform |
| **URI** | Uniform Resource Identifier |
| **VMI** | Vendor Managed Inventories |
| **WS** | Web Service |
| **WMS** | Warehouse Management System |
| **WSDL** | Web Services Description Language |
| **XML** | eXtensible Markup Language |
|  |  |

# Introduction:

The document captures the current technology landscape of SOLAR Group IT with focus on integration of applications at enterprise level. It captures details of application to application and Business to Business (B2B) integrations. This document is prepared based on discussions and meetings with various teams and stakeholders at Solar Group IT.

Following approach were adopted to capture the information:

1. Meetings with technology team (solution architect, technical architect, enterprise architects etc.) and other business stakeholders.
2. Meetings were conducted with onshore and offshore team from LTI. The offshore team participated through WebEx session. The sessions were webcasted on WebEx through webcam.
3. The sessions are broadly categorized according to the value streams:
   1. Supply Chain
   2. Commercials
   3. Finance
   4. Human Resource
   5. Data Analysis and Reporting
4. Solar team identified the integrations through whiteboarding.
5. This document captures the information provided in the meetings. The whiteboarded diagrams are recreated in Visio.

# Assumption:

* This document captures only the A2A and B2B integrations which were covered during the discussion.
* This document does not cover integrations which are planned to be phased out or have built in integrations (internal to the system).
* This is high level description of system integrations; does not cover technical implementation details.
* This document is purely based on the discussions with the SOLAR team and it mainly covers integration landscape implemented for Denmark.
* There are multiple ERP systems that are used in other countries, but they are not covered in this assessment.

# Key Participants:

LTI Team and SOLAR Stakeholders and Architects, PMs.

<need to put table with participant names>

# Supply Chain:

## Order management:

In this discussion, we covered the order management, the Integration flow around the various systems. We started with Sales Order entity and tried understanding the creation process. Overview of systems that create a Sales Order is shown below.

**Fig 1: SOLAR Sales Order Flow.**

The order entry mechanisms are as below:

* Web-service (Standard Order, Return Order and Fast Box Order)
* Hand scanner used at drive-in locations (Standard Order and
* Rush Order)
* SAP GUI (All type of orders)
* EDI (Standard Order)

## Supply Chain Management:

In this discussion, we covered Integration flow of supply chain management.

**Fig 2: SOLAR Supply Chain Flow.**

Below are the components discovered during the discussion, most of the integrations are P2P.

* SO99+
* SAP ECC
* DWH\_ALL
* VENDOR VMI
* SGS
* CONSIGNOR
* SalesForce
* EWM
* JD Edward
* Open Text ICC
* Plan D/PI

Details about systems/applications participate in Supply Chain flow:

|  |  |  |  |
| --- | --- | --- | --- |
| **Application/System Name** | **In house/Third party** | **On Cloud/On Prem** | **Remark** |
| SO99+ | Toolsgroup | On Prem | Service Optimizer |
| SAP ECC | SAP | On Prem | ERP |
| DWH\_ALL | MS SQL | On Prem | Data Warehouse |
| VENDOR VMI |  |  |  |
| SGS | SGS | On Prem | Warehouse management system |
| CONSIGNOR | Consignor | On Prem | Deliver management tool |
| SalesForce | SalesForce | On Cloud | CRM |
| EWM | SAP | On Prem | Extended Warehouse Management |
| JD Edward | Oracle | On Cloud | ERP |
| Open Text ICC | Open Text | On Prem | Invoice Capture Center |
| Plan D | In house | On Prem | Bundle of application for integration of various systems (Middleware) . |
| PI | SAP | On Prem | Process Integration (Middlware) |

**SO99+** : (Service Optimizer 99+)

* This tool executes material planning process for Solar.
* It creates purchase requisitions based on forecast recorded in the system. Purchase requisitions are sent to SAP via PI. (Flow: SO99+ --> PI --> SAP).
* It creates plan for next year by using previous year records as pattern.
* It updates factory calendar according to vendor holidays.
* It creates purchase requesitions in SAP ECC using IDoc format.

Integration between SO99+ and SAP is through SAP PI and the flow can be illustrated like this:



**SAP ECC:** SAP ECC is the on premise central ERP system which records the purchase requisitions and the purchase orders in this flow. The following functionalities of SAP ERP are used in this flow:

* **Purchase Requisition**: The inbound purchase requistions from SO99+ are created in this module. The inventory items follow the below color coding to denote their stock level:

Green= Stock

Yellow = Buy to order (BTO)

Red= BTO minus master data. Stock not available.

Blue = green in 1 country.

Note: Green and Yellow are the ones which are visible on website.

* **Purchase Order:** Purchase Order is created and passed to SAP ECC from vrious sources such as B2B partners (integration through EDI/Mail/API), JD Edward, SGS (through Plan D/PI), Vendor VMI (thourhg EDI), and with EWM (via Inbound Delivery).

PO flow can be demonstrated like this

* **Goods Receipt :** Goods Recipt is populated from SGS through Plan D/PI.
* **Invoice:** Invoice is populated from OpenText ICC. Once Invoice is created through payment channels it is issued to Banks using EDI.
* **Payment:** Paymen channel is used once Invoice is created in SAP ECC.

**DWH\_ALL**: DWH\_ALL is Data Warehouse/repository for Solar Supply Chain flow. SAP loads data into DWH\_ALL from which SO99+ derives details about Sales Order, Pricing, Optimal Purchase, Stock Level and details about old purchase orders . Details of DWH\_ALL is coverted in subsequent sections.

Data flow between SAP ECC and SO99+ can be illustrated like this:



**API**: API services are exposed for creation of purchase order for clients like Telenor. This is covered in the subsequent sections.

**VMI (Vendor Managed Inventory):** This is an inventory management and order fulfilment process. In this process, supplier of goods, usually the manufacturer, is responsible for optimizing the inventory held by a distributor.

In Solar context, the flow is like this

* SAP sends Sales Order Report to VMI parties through overnight batch processes.
* Based on the sales order report, VMI parties sends Purchase Order to Solar (in order to maintain their stock level). This is in the form of EDI transaction. The purchase order is interfaced to SAP in IDoc format.
* This functionality is provided through EDI (Electronic Data Interchange) using B2B gateway.

**CONSIGNOR:** Consignor provides managed service to Solar Group IT to take care of different formats used by different carriers or shipment providers. This is a third party delivery management tool which streamlines shipping processes in a standard format. This tool accepts input delivery or shipping document in its proprietary format, and transforms it into format expected by various carriers.

**SGS:** SGS is a warehouse management system used by Solar. The below functionalities of SGS are used for this flow:

**PO (Purchase Order)**: Vendor Managed Inventory(VMI) partners and B2B partners, send purchase order documents in various EDI formats. The EDI document is then interfaced to SAP ECC in IDoc format. Purchase orders are also created from mail attachments using OpenText ICC.

The purchase order is communicated to the respective vendors through email communication.

**GR** **(Goods Receipts):** Receiving of goods takes place at SGS. The good receipt is synchronized with SAP ECC using an interface which leverages SAP PI as middleware.

High level flow is like this:

**SP (Shipping Process) :** The pick, pack and ship process takes place at SGS. SGS sends the shipping document required by carriers to Consignor. The integration to Consignor is through SAP PI. To keep SAP ECC in sync, the shipping information is interfaced to SAP ECC. But SAP ECC captures this shipping information in Goods Receipt module as additional fields.

Advanced Shipment Notification transaction is not provided to vendors.

At High level the flow can be illustrated like this:

**Note**:

* Scanner functionality could be replaced by new webshop mobile.
* Project is underway to replace SGS with EWM. EWM is warehouse management suite from SAP. It has inbuilt integration with SAP ECC.
* It was indicated that there is vendor flow from SAP to SalesForce but in later session confirmed to be not present.
* Plan D is driver that is used to connect to SGS.

**Pain Points:**

* SOLAR currently does not have the functionality to track end to end flow of Purchase order document.
* SOLAR wants to implement advance shipping notice which will be used to notify customer to track the order using EDI format.

**EWM:**It refers to SAP EWM warehouse management packaged software. With the help of SAP EWM all the goods movement are controlled by a warehouse management system and monitors warehouse activities. SAP Extended Warehouse Management allows to not only monitor the quantity of goods in Warehouse but to manage other critical functions and delivery of goods efficiently.

**JD Edward:** JDE is an ERP system provided by Oracle. Integration of JDE with SAP ECC is through PI. This flow is explained in detail in following sections.

**Open Text ICC:** Open Text Invoice Archive is a web application using which the user can fetch invoices or delivery notes as pdf files. The user can open or download the pdf files from the tool and also mail the pdf files as attachments to oneself. It is used in different geographic locations and the user is given access using windows authentication through Active Directory (AD). This application is used by Solar finance team.

The key functions of the application are

* + Get the invoices/delivery notes for the document Id/s provided
  + Display the documents as pdf
  + Provide access to download the documents
  + Send the documents through mail

**Plan D:** Plan D is a set of applications that helps in transferring data across different systems. This acts as a data transfer agent between different applications.

Example:

PIWHSService application helps in sending the data from SAP PI to Warehouse Management System (WMS)

SCTSToWMSSender application helps in sending the data from DWH\_ALL to WMS application

WMSPISenderConsole application helps in sending the data from WMS to PI.

## Supply Chain and Master Data:

This section covers Master Data Management Architecture of SOLAR’s Supply Chain Process.

Below are the components discovered during the discussion: Integrations are mostly through API call and through SAP PI.

* EXCEL GENERATOR
* DMT
* SSP
* DWH\_ALL
* ABC TOOL
* HANDYMAN
* SOLAR LIGHT
* MAG 45
* LANGUAGE W
* S099+
* CLASSIC WEBSHOP
* SYSAID

**Details about the systems/tools used in this section:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Application/System Name** | **In house/Third party** | **On Cloud/On Prem** | **Remark** |
| EXCEL GENERATOR | In house | On Prem | Generates reports |
| DMT | In house | On Prem | Discount Mangement Tool |
| SSP | In house | On Prem | Single Source Plantform (Database) |
| DWH\_ALL | In house | On Prem | Data Warehouse |
| ABC TOOL | In house | On Prem | Custom in house tool |
| HANDYMAN | Handyman | On Prem | Scanning tool |
| SOLAR LIGHT | In house | On Prem |  |
| MAG 45 | MAG 45 Solutions | On Prem | Supply chain partner |
| LANGUAGE W | In house | On Prem | Language Translator |
| SO99+ | Toolsgroup | On Prem | Service Optimizer |
| CLASSIC WEBSHOP | In house | On Prem | Old webshop |
| SYSAID | SYSAID | On Cloud | IT Helpdeck |

**Fig 3: SOLAR Master Data and Supply Chain Integration Flow.**

**EXCEL GENERATOR:** Excel generator is a in house web application, used to generate reports based on different field classification like Material, Customer Prices, Internal Prices, etc. The report is driven by the template selected which will enable the user to choose the fields under different groups required in the report. The reports can be generated in excel, csv and html file format. Based on user preference, it gives specific reports which can be downloaded. It gets data from DWH\_ALL DB. Excel Generator is a tool

It performs the below functions:

* Generate Reports
* Manage Queries for Reports
* Generate reports using OData
* Administration

**DMT**: Discount Management Tool system provides pricelists and discounts. The price and discount of materials offered to the customer is collectively termed as an agreement as this acts as a binding document on both the parties, Solar A/S and the customer.

The sales team creates/updates the customer agreement which contains material price and discount offered to the customers. So salesman manages discounts and prices both for materials and product hierarchies in DMT. If a material doesn’t have a discount or net price directly, it will get the values from the product hierarchy level which it is attached to. The agreement will go through the approval process, and once approved the agreement will be uploaded to SAP, which reflects the updated price and discounts being offered

It performs the below functionality:

* Create agreement
* Agreement approval mechanism
* Load approved agreement into SAP
* Export\Import Agreement to\from excel
* Administration

**SSP: Single Source Platform – this is fraud and risk management system.**

MDM pushes data to staging tables in SSP. All data is sent to the SingleSource platform and is continually being analysed and profiled by the Fraud Intelligence Engine which uses advanced graph technology and fraud profile algorithms to connect various data points in real-time to enable a holistic assessment of a customer’s fraud risk.

**DWH\_ALL:** Refer section 4.2 for details. From Master Data Management perspective, It acts as a data provider to applications such as DMT, Excel Generator, etc.

**ABC TOOL:** The ABC tool gets data from SAP ECC through SAP PI using the IDoc format. This is discussed in detail in section 4.11.

**HANDYMAN WEB SERVICE:** Handyman is a standalone application with its own database, frontend and login management. This provides project list and stock level information. It has point to point integration with SAP to retrieve this information. This application connects with SAP system through SAP Connector