Controlling complex logistics processes with SAP
About Dematic

Dematic is a global leader providing an impressive range of intelligent logistics and materials handling solutions. With a global knowledge network of more than 4000 highly skilled logistics professionals, Dematic is able to provide its customers a unique perspective in world class materials handling solution design.

This means for you: Even in international projects, you only have one point of contact. Dematic takes into your logistics projects with overall responsibility for throughput and availability.
Automated logistics systems are designed to meet customer requirements for use of an average of 10 to 15 years. Anyone looking for a new solution should consider carefully which of the offered concepts is actually sustainable. Modern solutions that still meet the requirements tomorrow are desired.

This applies not only to new installations. The logistic environment, logistic processes and the IT landscape may change in existing plants as well. New requirements should be easily implemented.

- Partnerships between SAP and Dematic ensure Dematic’s advance in SAP know how.
- Dematic knows at an early stage in which direction SAP moves and develops solutions which are future-proof.
- Dematic has implemented numerous SAP logistics projects both in manual and highly automated environment and thus has the best qualification for competent SAP consulting for your logistics.

Today’s consultation focus is on the implementation of SAP EWM and SAP LES. This is regardless of whether you have a pure IT project (stand-alone IT), intend to modernise an existing facility or build a new logistics centre. Dematic develops logistics solutions on the basis of established and innovative components which are tailored to the customer’s business processes.

Dematic is specialised in integrating all systems – top down from host to material handling equipment – into a complete system. Dematic also implements highlights such as triple-deep storages.

**Partnerships and portfolio**

SAP and Dematic are connected through strong partnerships and cooperations for many years. These partnerships allow Dematic to adjust its own software and hardware components to SAP’s latest software releases for your benefits.

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**Dematic SAP service portfolio**

- **Conception**
  - SAP EWM / LES Feasability Studies
  - Analysis and Reengineering of Business Processes

- **Implementation**
  - SAP Logistics Implementation
  - SAP Add-on Development
  - Integration Sub-Systems
  - SAP Upgrades
  - Migration to EWM / LES
  - Training

- **Service**
  - Maintenance & Support
  - Project Management
In complex warehouse and distribution centres the classic basic functionality of a warehouse management system – such as support of goods-in and goods-out, replenishment and inventory management – is no longer sufficient. In fact additional functions support complex processes such as cross-docking, returns processing, additional logistics services and multi-customer warehouses are required. Also the mapping of the material flow components with direct link to the programmable logic controllers is becoming increasingly important. To counter the cost pressures, in addition, a resource and labour management is required.

Since 2006 SAP offers with SAP EWM (Extended Warehouse Management) a new solution for warehouse management. The performance of this solution goes beyond the existing and widely available SAP LES WM module. SAP EWM is part of SAP Supply Chain Management (SAP SCM) and supports inventory management and movement of goods in warehouses. The multi-client warehouse management solution was designed for large distribution centres with complex and highly automated processes.

Additional organisational structures
- Storage locations can be grouped in EWM to activity areas (e.g. storage). Warehouse tasks can be sorted according to activity (e.g. “fork lift truck required for task”).
- Yard management: With a high volume of traffic gates can be assigned selectively.
- Managing staging areas in stock.

Storage and retrieval strategies
Strategies for automatic storage and retrieval of goods are taken from EWM’s master data for goods-in/goods-out. Common services such as FIFO, LIFO, partially opened packages first, best before date, fixed locations, etc. are directly supported.

Storage and retrieval strategies can be expanded and adjusted by Dematic’s business add-ins. Furthermore the Dematic solutions offer the possibility to process goods movements manually, as well as changing source and destination locations which are normally determined automatically.

Visualisation
Dematic has the knowledge to implement visualisations directly into SAP. These visualisations can be in the form of 3D images of the warehouse topology or a live stream from a webcam. For example Dematic has developed a solution with a webcam mounted on a stacker crane.

Support of handling units
Handling units are a special SAP feature. They characterise a physical unit of packaging – such as carton or pallet – and packed material. Handling units contain information such as batch or serial numbers and can be nested. The Dematic solution offers status reports to all handling units as well as a history on their whole lifetime.

Warehouse management monitor
The warehouse management monitor is characterised by a variety of pre-defined reports as a central control and information tool. Additional workflows can be associated, controlled and tracked directly from the warehouse management monitor.
Alert monitor
The alert monitor provides an overview, if any errors have occurred within the material flow. For example, the system shows the priority, the time, and a description of the error. If available, the system displays additional information such as sender, recipient, source or destination of the message that caused the error.

Logistic value-added services
The possibility of offering value-added services (such as labelling, kitting, assembly, etc.) becomes more important and gives you a competitive advantage.
SAP EWM supports you with value-added services where appropriate steps between the storage and retrieval are provided.

These orders determine which product finishes will be carried out, for example at work stations.

Wave picking
Along with handling several picking orders, EWM supports wave picking. Here multiple picking orders are bundled, processed together and afterwards separated again. The compilation of waves takes place automatically or manually according to activity areas, routes or products on the basis of provided rules. Dematic has special know how in generating these rules.

Multi-customer warehouse
If you intend to take over logistics services for your clients, the following features are important to you:
- Separation of the various customer stocks
- Connection to customer host system (SAP and non-SAP systems)
- Depending on customer service
  - Different number ranges
  - Different print layouts
  - Separate inventories
  - Custom storage/retrieval strategies

Like all products from Dematic, Multishuttle can be optimally integrated into a SAP EWM solution
- Load types: Plastic tote box, cardboard carton, trays
- Load weight: up to 50 kg
- Variants:
  - Static: Telescopic load extractor (fixed length & width)
  - Belted: Belt conveyor load deck
  - Flex: Telescopic load extractor; expands/contracts, accommodates a range of load sizes
- Suitable for chilled storage
- Storage density: single or multiple-deep

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SAP LES Logistics Execution System

SAP LES is a part of SAP ERP. The application scope of this component includes manual and automated warehouses. Besides management of inventory and resources, LES supports the complete handling of the customer orders, including picking.

Many customers face the task of replacing existing logistics systems. In doing so they want to benefit from the advantages which the integrated SAP software offers. Dematic has already carried out many migrations to SAP LES and proven its outstanding know how. The adjustment usually takes place during ongoing operation of the site. Due to intelligent migration concepts, a disturbance of deliver capacity is avoided.

Dematic EWM standard templates

Fast, low-risk implementation

An EWM implementation in a highly automated warehouses presents a special challenge. To simplify the system implementation, Dematic offers own EWM templates, which are implemented in customisable tables.

This standardisation offers you a rapid, low-risk implementation and a simple support of the system in a production environment. The Dematic EWM standard templates support the following functions:

- Dematic Multishuttle strategies
- Complex sequencing strategies
- Double load handling for stacker cranes
- Multi-deep storage locations
- Connection Kardex
- Direct connection of layer de-palletising robots including full functionality
- Emulation with 3D warehouse model

Warehouse modules within SAP ERP

SAP WM Warehouse Management

If the SAP warehouse module is not installed as a centralised solution (LES), but within a central ERP system, then you can use the SAP WM warehouse module.
Controlling highly automated installations directly from SAP EWM: Miniload RapidStore ML 20

- Handling of different containers and carton sizes
- Lightweight two-mast design (Aluminum), 20 m height
- Modular construction design standardised components
- Scalable to any Dematic solution
- High flexibility with interchangeable Load Handling Devices (LHD) and high performance
- Energy-efficient motors and drives
With increasing globalisation supply chains are getting faster and more complex. With the Transport Management (TM) SAP therefore offers a special module within SAP SCM, which includes all activities associated with the physical movement of goods from one particular place to another.

With SAP Transportation Management, you calculate freight costs based on actual shipments and freight rates. This information can then be used to check the calculations of shipping agencies and other service providers.

Thereby Dematic provides you a comprehensive know how from intralogistics to global transportation logistics.

**With SAP Transport Management you can:**

- Optimise transport processes, assign shipping agencies and advertise shipping orders
- Consolidate orders and transports both optimised centrally and for each office
- Select shipping agencies, calculate and billing of shipping costs, print receipts
- Exchange information with shipping agencies and carriers online via web platform
- Use sanction and embargo lists for international shipping

**Functional overview of SAP TM (excerpt)**

- Freight management
  - Contacts with customers
  - Shipping requests
  - Freight inquiries
  - Shipment registration
  - SAP ERP integration
  - Order to cash
  - Procure to pay
  - Simulation of transport costs
- Transport planning & execution
  - Manual planning
  - Planning / optimisation
  - Transport proposals
  - Scheduling
  - Mission assignment
  - Cargo commission
  - TDL selection
  - Announcement
  - Transport connection
  - Booking maritime
  - Booking air transport
  - Chamber planning
  - Cargo booking
  - Transportation execution
  - Replanning
- Management of transport costs
  - Transport cost calculation
    - Engine for costs and rates
    - Freight agreements with customers
    - Freight agreements with shipping agencies
  - Freight clearing
    - Freight clearing customers
    - Invoice preparation
  - Pay suppliers
    - Payment preparation
- Finance integration
  - Payment / billing
    - Customer account
    - Freight audit & billing procedure
  - Finance
    - Account determination
    - Partial payments
    - Mass payment
  - Controlling
    - Profitability analysis
    - Profit sharing

Integration in Supply Chain Execution Platform (EM, GTS, EWM)

- Analytics (business intelligence)
- SAP Mobile
- Integration 3rd party
Dematic SAP EWM solutions support Dematic RapidPick picking stations

- Delivery of containers and cartons
- Intelligent and flexible feeding sequence (heavy goods first, fragile items last)
- Short changeover time of pick and put containers (< 1s)
- No manual handling of containers (time savings)
- Ergonomically optimised
Dematic Sub-Suite 2.0
Solution to support bi-directional communication between SAP and sub-systems

The Dematic Sub-Suite meets the needs of many users who want a simple and efficient solution to connect their sub-systems, such as Pick-by-Voice, Pick-by-Light or PLC control systems.

The material flow component of Dematic Sub-Suite offers a pure SAP solution in which the functionality of a material flow system is shown completely in SAP LES. This allows adjustments to be made to the software at any time by the customer in SAP.

The device-related connection is carried out by a controller in the cabinet. The Dematic Subdriver translates SAP XMII and RFC communication in TCP/IP socket communication understandable for PLCs. Data exchange takes place via messages.

The advantage of this solution is that the middleware is completely eliminated and a technological rupture, resulting from the use of different software systems, is avoided. The result are cost effective, streamlined and practical solutions, especially for modernisations, in which old procedures will be replaced by a SAP-based solution.

The illustration below shows an example of a PLC control system and the different integration scenarios that are offered to the user:

Benefits of Dematic Sub-Suite

- Cost savings due to elimination of:
  - Hardware for hosts and middleware
  - Licenses for database and operating system
  - Paid updates
  - Maintenance costs for hardware and software
  - Additional implementation effort

- Independence of middleware software vendor:
  - Using open source in SAP ABAP
  - Service and expansion by SAP in-house department
  - Simple and low spare part management

- Rapid implementation:
  According to experience the implementation effort for a Sub-suite solution is just a few days.

Integration scenarios for a direct linking of sub-systems
The Dematic Sub-Suite 2.0 solution

The Sub-Suite solution eliminates the need for middleware as well as the introduction of unnecessary additional SAP components. The Dematic Subdriver module can be installed and connected in minutes to the existing network. The Subdriver is ideal for connecting sub-systems such as Pick-by-Voice or Pick-by-Light.

Compared to traditional paper-picking with lists or radio, Pick-by-Voice offers many advantages - the communication is not visually on screen and paper, but by voice instructions through a headset and microphone.
Open for changes
With varying markets and company relevant changes, demands towards logistics can change quickly as well. Therefore it is very important that solutions be designed to cope with basic modifications, such as automation of manual processes, or that the implementation of a new picking method can be accomplished easily. Dematic solutions are open for changes so that investments are protected.

System administration
System administration of SAP solutions can be covered by already available SAP system administrators. Additional help can be provided by the inexpensive remote assistance functions offered by Dematic.

Release capability
Dematic focuses on standards. When implementing SAP, only interfaces provided by SAP are applied (IDocs, RFCs, BadIs, customer functions, etc.). As a result applications are very robust towards release changes.

Quality standards and system security on a high level
Planning and implementation of Dematic projects are quality controlled. Customers benefit right from the beginning: from professional consultation and smooth commissioning to the point of reliable site operation with low downtimes and minimised service efforts.

High system availability
In addition to the stability of SAP systems, Dematic uses its own safety mechanisms for mechatronics which provide a controlled warm start in case of a plant shutdown.

TCO / ROI
When planning and implementing logistics systems also a TCO analysis of the customer is taken into consideration. In addition, many projects have introduced a fast ROI in short time, thus improving the competitiveness of the customer.

Dematic Services

Added value from your lifecycle partner
After commissioning, Dematic offers comprehensive support for your system solution including hardware and software. On-demand 24-hour service is available all year long.

With the customer’s approval, support and monitoring of the software can be carried out via remote maintenance. This service can be offered at a reasonable price since travel expenses do not apply.

Maintenance Services
- Technical phone support 24/7, remote maintenance
- Diagnostic inspection and troubleshooting
- Software updates, system support
- Emergency services
- Supplemental resident support
- Consulting & training

Maintenance Based Services
- Handling of change requests
- Modernisation and upgrading
- Service consulting
With our complete service and support packages, you can be sure to exhaust your investment at any time perfectly.

That means: to increase the operational time of your investment, minimise downtime and to have the security that you can always rely on your system – even if you need to operate at full capacity.
Standardised methodology for project success

**Feasibility studies**
Complex SAP projects often start with a feasibility study which evaluates project risks and is a foundation for later SAP implementations - even during day-to-day business. Dematic also analyses customer requests to make recommendations concerning SAP EWM versus SAP LES.

**SAP logistics consultation**
Expertise in developing logistics solutions in combination with excellent knowledge of industry specific business processes and well-founded SAP know how characterise the high level of Dematic’s SAP logistics consultation. For existing facilities, we support you in process optimisation and re-design.

**Business blueprint**
The business blueprint is the detailed specification of your requirements. Your processes are initially recorded and analysed. Together with you we will then determine how the processes and functions are to be mapped to the new system and what actions are required for implementation. In the blueprint, this is documented in writing.

**Emulation**
In automated warehouses we always create a 3D emulation of your warehouse architecture. Changes in your processes can therefore be tested very quickly against the emulation, first ground tests should be performed on the customer site before the actual commissioning. By this the on-site commissioning time is reduced, errors are avoided and risk is minimised.

**Implementation**
The implementation of your requirements starts once the details are clarified. The precise clarification of details in the previous business blueprint phase saves implementation time and allows adjustments during ongoing operations.

In principle realisation is carried out with the aim of using the SAP standard. If additional developments are still necessary, they must be implemented by Dematic standard development guidelines.

**Test phase**
Dematic focuses on an adequate trial period to ensure the quality of the project. The necessary tests are carried out in several successive steps:
- Single function test
- FAT (Factory Acceptance Test)
- Load test
- Integration test
- Installation test

**Migrations**
Dematic takes over the complete migration of legacy systems and carries out all necessary steps for enterprises which would like to shift their existing logistics systems to SAP EWM or SAP LES. The large sum of experiences, gathered in many projects, allow a seamless changeover during ongoing operation. Normally a parallel operation is not necessary.

**Integration of sub-systems**
As one of the clear leaders in logistics automation, Dematic has special expertise in connecting sub-systems. Dematic strictly keeps up with standards, so that the system is open to later changes.

**Training and information**
Information events and training are very important for the users, particularly with regard to modernisation projects. Acceptance of a new solution can be increased considerably by early information events and by tuning up the installation faster after commissioning.
Industries
- Food and beverage
- Chemical and pharmaceutical industry
- Manufacturing and electronics
- Wholesale and retail
- Spare parts supply

Solutions
- SAP EWM solutions close to the standard
- Material flow solutions on basis of SAP EWM / MFS
- Implementation of SAP LES / WM projects
- Connection of subordinate WMS to SAP
- SAP direct link to automation technology via Dematic Subdriver

Warehouse types
- Fully-automated warehouses
- Semi-automated warehouses
- Manual warehouses
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