Extended Supply Chain

SAP Solutions for Supply Chain Execution

Markus Rosemann/
Vice President Logistics, Extended Supply Chain, SAP SE
SAP Solution Strategy
Connect your Company Strategy with your Customer & Product Strategy

Personalized Solutions
Product Networks

Improve People’s Lives
Internet of Things

Design

Plan

Respond

Monitor

Operate

Deliver

Produce

Customer Centricity
Demand Networks

SAP HANA Platform
The role of logistics is changing
Global business drivers impacting logistics

**Increasing market volatility**
Major shifts in customer demand volume, increasing regulations, new competitors

**Escalating customer expectations**
Customer is demanding high-quality, flexible delivery becoming the #1 logistics objective

**Declining logistics performance**
Impact of disruptive events and technology changes while cost budgets stay the same
Major challenges for logistics and distribution

Cost pressure
Logistics cost average 10% of revenue and are still increasing, bearing optimization potential

Transparency remains vague
Logisticians require process control along with real-world based insights for rapid and effective decision making

Isolated operations at logistics partners
Manufacturers, freight forwarders, carriers and retailers operate independently
Strategies for logistics and order fulfillment

**Logistics optimization**
- Translate constraint-based manufacturing and inventory optimization to logistics capacities
- Differentiate in logistics with planning and response management
- Evolve from goods fulfillment to e-commerce business

**Real-time insights and control**
- Connect logistics to the internet of everything for business
- Simplify material flow and increase warehouse efficiency
- Provide insights into the network for effective and responsive decisions, and execution

**Connected logistics**
- Orchestrate strategic and medium-term planning for manufacturing companies, freight forwarders, carriers and retail companies on one platform
- Determine best mix of carriers to meet business goals
- Sense and respond to logistics insights
Warehouse Management

Optimize warehouse and distribution operations by combining optimization techniques with the end-to-end logistics process across a warehouse

48% Lower customer order cycle time
Where picking, packing, and shipping are automated

6% More orders shipped on time
Where warehouse process is optimized based on shipping times

Warehouse Management
Optimize processes, resources and assets in the warehouse. Manage quality, safety, automation, inventory in end-to-end process optimization combined with state-of-the-art analytics.

Dock Appointment Scheduling
Manage the inbound and outbound flow to and from warehouse dock doors. Reduce delays and fees from carriers and increase service levels. Maintain and update appointment with carriers.
Overview of SAP Extended Warehouse Management
A complete and integrated solution

Inbound processing
- Transportation unit processing
- Goods receipt management and optimization
- Inbound quality management
- Yard management

Storage and operations
- Physical inventory
- Replenishment and rearrangement
- Kit-to-stock management

Outbound processing
- Outbound planning (route, wave, bin, cartonization, and so on)
- Picking optimization, packing, staging, and load management
- Value-added services

<table>
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<tr>
<th>Analytics</th>
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<td>Labor management</td>
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<td>Cross-docking</td>
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<td>Native technologies</td>
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<td>Implementation tools</td>
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</tbody>
</table>
Overview SAP EWM customer & market status
Strong customer growth and implementation momentum

Facts and figures

- Over 200 active customers added in 2013
- More than 700 distinct live customers
- Leader in Gartner’s Magic Quadrant and ARC market studies
- Productive use of SAP EWM in more than 20 countries and 24 industries

Sample customers

Customer geographical coverage
**Built-in optimization**
Wave management, labor management, and slotting

**Wave management**
- Optimized work orders; efficient pick path

**Labor management**
- Reduced labor costs; improved labor planning

**Slotting**
- Advanced storage concept; ABC goods classification

**Cartonization**
- Automatic shipping-unit determination
Leading-edge warehouse technology integration
Increased accuracy, efficiency, and visibility

Material flow system (MFS)
- Programmable logical controllers (PLC)
- Pallet and case conveyors
- Multi-deep storage

Native technology integration
- Augmented Reality
- Mobile radio frequency (RF)
- Pick by voice
- RFID
Native integration with SAP Business Suite

Sales and distribution
- Order processing
- Customer relationship management (CRM)
- Back-order processing (global available to promise)
- Advanced claims and returns management
- Track and trace

Procurement
- Advance shipping notification (ASN)
- Inbound quality management

SAP Manufacturing
- Advanced Manufacturing Integration
  (Production/Process orders and crate parts)

SAP Environment, Health, and Safety Management
- Dangerous goods handling
- Storage and document printing

SAP Global Trade Services
- Compliance with import and export regulations
- Customs; bonded warehouse

SAP Quality Management
- Pre-sampling in Production, Acceptance Sampling before GR, Inspection Lot Summary, Recurring Inspection, Control Invoice Verification
Analytics with SAP EWM
Comprehensive stock and process transparency

Supply chain manager
Cross-warehouse performance monitoring

Warehouse supervisor
Comprehensive, central warehouse operation monitor
Alert and exception monitoring, drilldown, and direct-action triggering

Real-Time operational reporting and predictive analysis

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SAP EWM – Labor Demand Planning

Use Case
A shift manager can select the date and the view, i.e., activities and activity areas he/she is interested in, and can efficiently plan his workers to activities. Each hour today shows how many warehouse workers are needed in the selected areas.

Benefits
Advanced Workload Calculation based on Predictive Analysis
- Actual planned workload
- Combined with forecasted workload based on HANA-based predictive analytics

Enables walking through the warehouse to see the physical reality and getting real-time insights based on the dashboard presented on a mobile tablet

Allows flexible and graphical workload display
- Time frame selection
- Graphical workload display per hour, day, or week for selected warehouses, activity areas, & activities
SAP Smart Business for SAP Extended Warehouse Management

Use Case
Overview of the most important KPIs for a warehouse shift supervisor
• To monitor the workload for his or her shift for outbound/inbound deliveries
• To determine overdue outbound deliveries or outbound/inbound delivery items in real-time
• To monitor the average goods issue delay time

Benefits
• Secure Warehouse Operational Excellence by fast identification of work exceptions (e.g., overdue picking) and fast implementation of counter measures to avoid delayed shipments
• Real-time information on overall Warehouse Execution Quality of current shift
• Enables walking through the warehouse to see the physical reality and getting real-time insights based on the dashboard presented on a mobile tablet

KPIs for Outbound Deliveries (as of SP00)
• Number of Outbound Deliveries
• Number of Outbound Delivery Items
• Gross Weight of Outbound Delivery Items
• Volume of Outbound Delivery Items
• Overdue Outbound Delivery Items
• Overdue Outbound Deliveries
• Average GI Delay Time

KPIs for Inbound Deliveries (as of SP02)
• Number of Inbound Deliveries
• Number of Inbound Delivery Items
• Gross Weight of Inbound Delivery Items
• Volume of Inbound Delivery Items
• Delivery Unloading Outstanding

Key performance indicators

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SAP’s Supply Chain Platform on HANA and in the Cloud

SAP HANA-powered SCE
HANA-run solutions
• SAP TM, EWM, EM on HANA

SAP HANA-powered Analytics
• Dashboards
• Reports
• Fiori-Apps

On-Premise
• TM 9.2
• EWM 9.2
• EM 9.2

HANA Enterprise Cloud
• TM 9.2
• EWM 9.2
• EM 9.2
“We deployed SAP EWM at five large sites. It has helped us raise productivity, reduce costs, improve the customer experience, and become a safer place to work. We are seeing less travel time, fewer unnecessary exits from the forklifts, shorter loading and unloading times, and a more accurate order picking process.”

Venkat Paruchuri, Director of Supply Chain IT, Dr Pepper Snapple Group
Enable companies to better meet transportation demands with streamlined processes, decreased costs, improved compliance and flexibility.

22% Lower spend
When transportation is integrated with SAP ERP and partners

13% Less invoice errors
With automatically calculated and distributed costs

Transportation Management

Transportation Requirements Management
Centralize transportation requirements management, from entry to final settlement.

Freight Planning and Optimization
Optimize and balance freight costs and constraints.

Freight Tendering
Create an automated environment for freight tendering.

Carrier Booking
Automate a collaborative environment for carrier booking.

Transportation Execution and Monitoring
Execute and monitor transportation and planning.

Freight and Forwarding Settlement
Manage and settle freight agreements for carriers and customers.
Business process coverage with SAP TM
Role-based functionality

- Contract Manager:
  - Strategic Capacity Procurement & Network Planning

- Transportation Clerk/CSR:
  - Order Management

- Planner/Specialist (i.e., Tendering):
  - Freight Planning & Tendering

- Dispatcher:
  - Freight Execution & Monitoring

- Charge Clerk:
  - Carrier Freight Settlement

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<td>Standard Document and Output Management for all Modes of Transport</td>
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<tr>
<td>Integration and Connectivity</td>
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</table>
Comprehensive SAP Business Suite integration

- **Sales & Procurement**
  - Sales/Stock transfer order scheduling/ATP
  - Sales, purchase, returns, & stock transfer orders

- **Logistics Execution**
  - Delivery & shipment processing
  - Warehouse planning & execution (EWM)

- **Environment Health & Safety**
  - Compliant dangerous goods shipment

- **Global Trade Services**
  - International trade regulation compliance
  - Customs export processing

- **Financial Management**
  - Carrier invoice verification & payment/self-invoicing
  - Sales order profitability & material valuation

- **Enterprise Asset Management**
  - Resource maintenance (time or mileage)
  - Resource downtimes & locations

Comprehensive ERP Master Data Integration
Strategic Capacity Procurement and Network Planning
Strategic Freight Management – Business Scenario

- Shipper/LSP
  - Freight RFQ
  - Strategic Freight Procurement
    - Goal: Freight Agreement with Carrier
  - Response
  - Quotation
  - Freight RFQ (SFP)
  - Strategic Freight Selling
    - Goal: Forwarding Agreement with Customer
  - Forwarding Agreement Quotation Response
  - Quotation Response
  - SAP TM

- Carrier/LSP
  - SAP TM
Order Management
Integrated ERP Transportation Demand

Integrated Order-to-Cash/Procure-to-Pay Processes

SAP ERP Transportation Demand
• Sales orders
• Purchase orders
• Stock transport orders
• Returns
• Inbound/Outbound deliveries
• Shipments

• Holistic integration and management of all transportation demand
• Synchronized sales and STO (ATP) and transportation scheduling
• Full cross-system order access and lifecycle status visibility
Order Management
Holistic end-to-end order management

Complete Order Lifecycle Management & Visibility

Freight Orders & Bookings

- General data
- Business partners
- Terms & conditions
- Cargo management
- Dangerous goods
- Transportation stages
- Freight execution
- Output management
- Document flow
- Freight charges

Capacity & Demand Planning
Freight Planning & Tendering

Freight Execution & Monitoring
Freight Settlement

Tracking & Reporting
Freight Planning & Tendering
Advanced Freight Planning & Optimization

Optimal Transportation Planning & Resource Utilization

Holistic
- All freight demand & resources
- All geographies & modes

Effective
- Manual, map-based, & automated planning
- Transportation proposal, vehicle scheduling, & routing optimization
- Rail & Parcel planning, Backhaul planning
- Resource-based planning on Gantt Chart

Advanced
- Powerful planning strategies
- Extensive rules & constraints
- Automated Load Planning & Vehicle Space Optimization

Compliant
- Dangerous goods planning
- Trade regulation checking
Flexible collaboration and communication with carriers
TM collaboration portal

Main Coverage
• Web-portal for business partner collaboration on transportation and logistics processes/documents

Process Coverage
• Freight Tendering
• Event Notification
• Self-Billing and Invoice Submission
• Dispute Management
• Strategic Freight Procurement
Freight Execution & Monitoring
Flexible business partner communication

Comprehensive, Flexible Communication & Collaboration
Via … B2B, Carrier Portal, Mobile Apps, WebUIs, File up/download, Print Documents, Email, Fax, SMS …

Shippers
- Rates
- Schedules
- Agreements
- Tenders/Quotations
- Freight Orders/Bookings
- Freight Documents
- Shipping Status/Events
- Invoices (via ERP)

Business Partners
Integrated Export, Import, and Transit Processing

**SAP Transportation Management**
- Customs-relevance checking
- Customs grouping
- Trade compliance check request
- Export/import declaration request
- Export/import freight booking/order

**SAP Global Trade Services**
- Embargo & sanction party list checking
- Customs export/import declaration creation
- Electronic filing & process management
International, cross-system shipment & event tracking
Integrated Event Management

Comprehensive Shipment Tracking
- Freight units, orders, bookings, & containers
- End-to-end (across pre, main & on-carriage)
- Cross-system & organization
- Shipper, carrier, & consignee views
- Full milestone tracking – from loading begin to proof-of-delivery
- Flexible event notification & handling
- Map-based event location visibility
- Instruction tracking for SOPs
Accurate, Integrated Freight Costing, Settlement, & Reporting

**TM Charge Management**
- Master data cockpit
- Comprehensive agreement management
- Flexible charge & rate management
- Advanced freight charge calculation, Cost distribution

**Freight Settlement**
- Accruals posting
- Carrier self-invoicing
- Invoice verification & payment
- Credit memo processing
- Dispute management

**ERP Freight Cost Accounting**
- General ledger posting
- Material valuation
- Sales order profitability analysis

**Freight Cost Reporting**
- Interactive freight cost dashboard
- Flexible business warehouse cost reporting
SAP Smart Business for SAP Transportation Management

Use Case

• Supports the transportation manager in the identification and valuation of his or her operational business and provides cost and revenue-based information in real time.

Benefits

• Increase data-driven decision making and optimize business based on real-time analysis of TM data.
• Powerful predefined KPIs for managers and end users with the ability to navigate into details.
• Single source of immediate insight instead of multiple, long running transactions and reports.
• Fast insights and reduced data complexity through real-time analytics on exceptions and deviances.
• Role-based and use case-driven creation of individual Launchpad.

Key performance indicators

• Transportation Cost
• Transportation Cost by Volume
• Transportation Cost by Weight
• Transportation Cost by Weight and Distance
• Transportation Revenue
• Transportation Profit
• Transportation Requirements
• Forwarding Orders
• Freight Orders
• Transportation Discrepancies
• Average Utilization
• Average Vehicle Resource Utilization
• Dangerous Goods
• Transported Volume
• Transported Weight

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Facts and figures

• Fastest growing market player

• Strong customer momentum
  – 300 TM Customers since Q4 2011
  – 60+ Live Customers
  – 100+ Ongoing Implementations

• Wide geographical coverage
  – Productive use of SAP TM in more than 25 countries and 21 industries

• Leader in Gartner’s Magic Quadrant and ARC market studies

Sample Customers

Customer geographical coverage
Logistics Network

Deliver the best-possible carrier services with improved freight contracting, holistic partner collaboration and transparency.

9% Less transportation spend
Where forecasts are dynamic and updated frequently

20% Fewer unplanned costs
Through visibility into in-transit and network-wide inventory

Sense and respond to logistics insights
Provide complete tracking of goods and assets in transit across the entire supply chain, allowing quick resolution of issues, lower operating costs, and limiting excess inventory.

Strategic Freight Management
Forecast and assess future transportation requirements. Request bids from carriers to address transportation needs, and negotiate contracts and agreements with carriers.
A business network for collaboration in Logistics

Optimize not only the silos, but across the ecosystem – with real-time transparency

- Increase infrastructure utilization and goods throughput
- Improve efficiency through process automation
- Reduce waiting times and manual monitoring
- Reduce emissions and environmental impact
Connected and Enterprise Visibility

A **business network** for collaboration in logistics
- Monitor traffic towards and within a hub
- Let involved parties communicate with each other – irrespective of whether they have a direct business relationship or not

With **SAP Connected** Logistics – public/private cloud (powered by HANA Cloud Platform)

**Company-centered visibility**
- Monitor complete e2e Order-to-cash/procure-to-pay cycles
- Visibility of goods & assets in-transit

With **SAP Event Management** – On-Premise or as private cloud (HANA Enterprise Cloud)
SAP Event Management

Key Features

- Capture business events and check against milestones
- Notify stakeholders & adjust the business process if required
- Real-time reporting and analysis for insight-into-action and risk mitigation
SAP Connected Logistics for Ports

Key Features

• Capture and monitor geo location of transportation units
• Geo fences for automatic notifications
• Role-based access and functionalities
• Communication with direct and indirect business partners
Use Case

- SAP Smart Business provides an overview of the most important KPIs for a transportation manager, enabling managers to monitor the operational transportation business based on the latest reported events.

Benefits

- Decision support based on real-time information made possible on one and the same system.
- Handling and on-the-fly analysis of high data volumes enables event-driven decisions.
- New opportunities for complex analytic views and reporting of up-to-date information in real-time.
- Getting rid of the latency that is usually involved when extracting data to the analytics tool in a batch run.
- Enticing user experience for occasional as well as operational power users.
Operational Reporting for SAP Event Management
Cockpit example using SAP Smart Business

<table>
<thead>
<tr>
<th>Event Management (TM)</th>
<th>Transportation Manager (EM)</th>
<th>KPI Modeler</th>
<th>Transportation Management</th>
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<tbody>
<tr>
<td>On-Time Performance Departure Trips</td>
<td>Track Freight Orders</td>
<td>KPI Workspace</td>
<td>Transportation Cost by Weight</td>
</tr>
<tr>
<td>90%</td>
<td></td>
<td>Manage KPIs and evaluate.</td>
<td>EUR/TO</td>
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<tr>
<td>On-Time Performance Arrival Freight Orders Today</td>
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<td>Configure KPI Targets</td>
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<td>Add filters to active evaluation</td>
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<tr>
<td>On-Time Performance Pick-Up Freight Orders Today</td>
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<tr>
<td>90%</td>
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<td>Create KPI Definition</td>
<td>EUR/KG</td>
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<tr>
<td>Delayed Freight Orders in Transit Trips</td>
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<tr>
<td>84.06%</td>
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<td>Define filters and targets</td>
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<td>Average Delay Time Freight Orders Today</td>
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<td>Configure KPI Drill Down</td>
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<td>1%</td>
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<table>
<thead>
<tr>
<th>KPI</th>
<th>Description</th>
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<tr>
<td>On-Time Performance Departure Trips</td>
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<td>Average Delay Time Freight Orders Today</td>
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<td>Transportation Cost by Weight EUR/TO</td>
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<td>Transportation Volume EUR/KG</td>
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<td>Transported Weight EUR/TO</td>
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<td>Average Vehicle Mileage EUR/KM</td>
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<tr>
<td>Transportation Profit EUR/TO</td>
<td>-65.77</td>
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</tbody>
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Hamburg Port Authority - steering course for the connected port of the future

“Our aim is to gradually interconnect all modes of transport – from waterways and roads all the way to the railway”
Supply Chain Integrity

Overview

Best-in-class Supply Chains

- All industries
- Traceability at the required level of granularity: batch, process, physical objects/serial numbers
- Tight integration with the SAP Business Suite
- Management by exception and efficient issue management

Supply chain integrity

Process Visibility & Goods/Assets in-Transit

Product Genealogy

Item Serialization & Product Traceability

Quality Issue Handling

Advanced analytics
Process and Goods/Assets in-Transit Visibility

Monitor

Manage by Exception

Analyze

SAP Event Management

Multiple SAP BS systems (e.g. ERP)

Multiple 3rd party systems

External collaboration & Mobile

Business rules for
- event occurrence & sequence
- overdue events
Product Genealogy

Capture & link batch usage
- Search
- Investigate
- Report

Explore/investigate
- SAP Global Batch Traceability
- Multiple SAP ERPs
- Multiple 3rd party systems
- Business Partner systems

Fast Reporting
Logistics and Order Fulfillment
Focus Topics and Outlook

- **Advanced Automation**
- **Verticalization & Integration**
- **Real-time Analysis & Simulation**
- **Logistics Service Providers**
- **Vendor**
- **Carriers**
- **Consignee**
- **Customs**
- **Global Business Network Connectivity & Collaboration**
- **End-to-End Supply Chain**

Real-time, functional, integrated, connected

Supply Chain Execution

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### Extended Supply Chain Value Map 2015

#### Demand Driven Business Planning
- Sales, Inventory and Operations Planning
- Demand Management
- Demand Network

#### Response and Supply Orchestration
- Response and Supply Management
- Production Planning and Scheduling
- Response Network

#### Efficient Logistics and Order Fulfillment
- Warehouse Management
- Transportation Management
- Logistics Network

#### Sustainable Product Innovation
- Project and Portfolio Management
- Design Orchestration
- Design Network

#### Automated Agile Manufacturing
- Responsive Manufacturing
- Production Operations Management
- Production Network

#### Operational Excellence
- Asset Operations and Maintenance
- Environment, Health, and Safety
- Asset Network

#### Real-Time Network Insights
- Extended Supply Chain Insights
- Product Safety and Stewardship
- Supply Chain Integrity
Integrating and connecting logistics

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<th>Mobile Enabled Experience</th>
<th>SAP HANA Platform</th>
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<td>Transportation Management</td>
<td>Real-time insights and control</td>
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<tr>
<td>Track &amp; Trace</td>
<td>Connected</td>
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</table>

**Logistics platform**
Warehouse Management, Transportation Management and Track and Trace converged on one platform

**Business suite integration**
Logistics seamlessly integrated to financials, order-to-cash and procure-to-pay

**Logistics network**
Orchestration of collaboration between logistics partners, and track and trace in the internet of things
## Logistics and Order Fulfillment
### Roadmap – Planned

<table>
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<tr>
<th>Warehouse Management</th>
<th>Recent innovations</th>
<th>Planned innovations</th>
<th>Future direction</th>
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<tbody>
<tr>
<td>• Advanced production receipts/staging</td>
<td>• Transit warehousing</td>
<td>• Suite for HANA enablement</td>
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<tr>
<td>• Multi-deep storage (for automation)</td>
<td>• Warehouse billing</td>
<td>• E-Commerce, B2C and retail focus</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Transportation Management</th>
<th>• Manual Planning with Gantt Charts</th>
<th>• Focus on logistics service providers</th>
<th>• Accelerated Supply Chain convergence</th>
</tr>
</thead>
<tbody>
<tr>
<td>• SAP HANA Smart business</td>
<td>• Transit warehousing</td>
<td>• Transportation resource planning</td>
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<th>Logistics Network</th>
<th>• Connected Logistics through the Internet of Things</th>
<th>• Broaden footprint of Internet of Things solutions</th>
<th>• Supply Chain Orchestration integrating Logistics Network</th>
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Thank you

Contact information:

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