Design to Operate
In the Intelligent Enterprise

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June 6th, 2019
Agenda

• Design to Operate Overview

• Q&A
The Digital Era is evolving into The Intelligence Era

Mainframe & PCs
1960s – 1980s
- Transistors & silicon revolution
- Large scale Mainframe Computing adoption
- Emergence of PC’s
- Plant floor automation

Client Server & Internet
1990s - 2000s
- Widespread PC adoption
- Broadband Internet
- ERP and business process technologies

Cloud, Mobile & Big Data
2000s - 2010s
- Mobile & Smartphone ubiquity
- Cloud Computing
- Social Networks
- Big Data

Intelligent Technologies
2010s - 2020s
- Machine learning (ML) and artificial intelligence (AI)
- Internet of things (IoT) and distributed computing
- Blockchain

CUSTOMER VALUE CREATION

Industrial Automation

Business Process Automation

Digital Transformation

Intelligent Enterprise

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The Intelligent Enterprise
Key End-to-End Processes

Source to Pay

Total Workforce Management

Design to Operate

Lead to Cash

Intelligent Suite

Intelligent Technologies

AI
Machine Learning
Analytics
IoT

Cloud Platform

Digital Platform

Data Management

Network & Spend Management

People Engagement

Digital Core

Manufacturing & Supply Chain

Customer Experience

Network & Spend Management

People Engagement

Digital Core

Manufacturing & Supply Chain

Customer Experience

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Design to Operate in the Intelligent Enterprise

Key Differentiators:

1. Intelligence built into business processes
2. Seamless Integration
3. Digital Twin along value chain
4. Asset Central for all of IES
5. End to End Visibility
Top floor wants the Connected Supply Chain but ... continues to organize in departmental silos
Digital Supply Chain
From Design to Operate

Design
- Reduce time to market
- Continuously and sustainably innovate
- Deliver on customer demand

Plan
- Holistic view of demand
- Balance inventory and service levels
- Improve forecast accuracy

Manufacture
- Optimize manufacturing processes and minimize waste
- Improve collaboration with contractors
- Increase agility and responsiveness

Deliver
- Improve speed, efficiency and sustainability
- Deliver perfect orders consistently and profitably
- Increase utilization of warehouse and transportation

Operate
- Manage lifecycle of physical assets efficiently and sustainably
- Predict and simulate asset behavior
- Avoid unplanned downtime
Connect Digitally to Perfect Reality – Design
Business value for R&D/Engineering

Innovate digital products and services faster
Enable new business practices by managing product and asset intelligence across networks

Institute design excellence
Drive product development based on requirements with an integrated systems engineering approach

Compliant product lifecycle management
Improve collaboration and integrate product development to be first to market with innovative, sustainable and compliant products

Increase profitability and visibility
Loop back failure and operational analysis from service to engineering for design improvement and lower product cost

8%
increase in meeting revenue goals with clearly documented and validated new product requirements.
SAP Performance Benchmarking

17%
decrease in time to market where product development projects are managed from concept to launch.
SAP Performance Benchmarking
Connect Digitally to Perfect Reality – **Plan**

Business value for Supply Chain

- **State-of-the-art business processes**
  Enable new end-to-end business processes, models and revenue streams

- **Synchronized planning processes**
  Eliminate planning silos through connected and integrated planning processes

- **End-to-end visibility**
  Provide visibility on strategic, tactical and operational levels across internal and external data

- **Faster planning cycles**
  React faster to changes in the business through complete integration across the supply chain

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40% shorter lead times with flexible rules-driven supply-demand matching. SAP Performance Benchmarking

12% fewer days in inventory with dynamic, frequently updated forecasts. SAP Performance Benchmarking
State-of-the-art business processes
Leverage new technologies to identify and enable business processes with highly flexible UI’s

Connected manufacturing
Eliminate manufacturing silos through a single data model with connected, integrated processes

Top floor to shop floor visibility
Complete end-to-end visibility on strategic, tactical and operational levels

Faster more efficient execution
Improve throughput, increase quality, and reduce waste

Advanced analytics
Leverage configurable KPI’s to identify process bottlenecks and improve performance efficiency

8%
increase in plan adherence where delivery dates are integrated with material availability and real-time manufacturing conditions.
SAP Performance Benchmarking

28%
decrease days in inventory where manufacturing processes are controlled through pull-based production schedule.
SAP Performance Benchmarking
Connect Digitally to Perfect Reality – **Deliver**

**Business value for Logistics**

- **Balance customer service and delivery costs**
  Enable efficient logistics and order fulfillment processes to increase speed and reduce cost and emissions

- **Warehouse Management**
  Optimize labor, storage, and fulfillment costs

- **Transportation Management**
  Reduce costs and carbon footprint and improve service, efficiency, and sustainability

- **Logistics Networks**
  Collaborate with logistics partners and improve fulfillment through visibility and IoT connectivity

93% increase of domestic on-time delivery.
SAP Performance Benchmarking
Connect Digitally to Perfect Reality – Operate

Business value for Asset Management

State-of-the-art business processes
Leverage new technologies to enable new asset management business processes with highly flexible UI’s

Real-time insights
Provide end-to-end visibility on strategic, tactical and operational levels

Connected assets
Bring together information from operational and business systems using IoT for scalable transparency

Prediction and simulation
Drive smarter decisions, improve reliability, and reduce outages and emissions

Collaboration throughout the asset lifecycle
Share asset information and collaborate on a cloud-based business network with integrated processes

17% increase in return on assets where asset management systems are fully integrated.
SAP Performance Benchmarking

79% decrease in accident frequency with monitoring of strong safety measures for people and assets.
SAP Performance Benchmarking
Evolution of the Digital Twin | From Data Repository to Intelligent Orchestrator
# Design to Operate (Overview)

<table>
<thead>
<tr>
<th><strong>Design</strong></th>
<th><strong>Plan</strong></th>
<th><strong>Procure</strong></th>
<th><strong>Operate</strong></th>
<th><strong>Manufacture (Subassemblies)</strong></th>
<th><strong>Manufacture (Finished Product)</strong></th>
<th><strong>Sell</strong></th>
<th><strong>Deliver</strong></th>
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<tr>
<td>Receive customer feedback – define <strong>requirements</strong> and <strong>system concept</strong> for new/changed product.</td>
<td><strong>Plan demand</strong> for new/changed components.</td>
<td>Procure <strong>components</strong> to build subassemblies.</td>
<td><strong>Monitor</strong> assets with IoT data, perform analysis, <strong>predict</strong> asset failure.</td>
<td>Schedule subassembly production.</td>
<td><strong>Receive</strong> procured components into warehouse.</td>
<td><strong>Schedule</strong> finished product production.</td>
<td><strong>Plan</strong> transport, pick, pack and load product for delivery.</td>
</tr>
<tr>
<td>Create <strong>product design</strong> and maintain master data for new/changed product.</td>
<td><strong>Plan supply</strong> for new/changed components.</td>
<td>Manage and track inbound delivery.</td>
<td><strong>Plan</strong> asset management.</td>
<td>Produce subassemblies and track progress.</td>
<td><strong>Receive</strong> subassemblies into warehouse.</td>
<td><strong>Produce</strong> finished product and track progress.</td>
<td><strong>Perform &amp; track</strong> out-bound transportation and receive proof of delivery.</td>
</tr>
<tr>
<td><strong>Handover</strong> to manufacturing and service to manage BOM and Routing.</td>
<td></td>
<td>Receive procured components into warehouse.</td>
<td><strong>Register</strong> serialized finished product.</td>
<td></td>
<td></td>
<td><strong>Register</strong> finished product into warehouse.</td>
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<tr>
<td><strong>Create master production schedule.</strong></td>
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**Operate**

- Perform inspection, **maintenance** and repair.
- **Request product** improvement.
- De-commission asset.

**Sell**

- **Receive** customer sales order. 
  (Assemble to Order)
Design to Operate (Overview)

**Design**
- Receive customer feedback – define requirements and system concept for new/changed product.
  - SAP S/4HANA Cloud for intelligent product design
  - SAP 3D Visualization* • SAP Engineering Control Center
- Create product design and maintain master data for new/changed product.
  - SAP S/4HANA* • SAP Engineering Control Center
- Handover to manufacturing and service to manage BOM and Routing.
  - SAP Integrated Business Planning* • SAP S/4HANA*

**Procure**
- Procure components to build subassemblies.
  - SAP S/4HANA*
- Manage and track inbound delivery.
  - SAP S/4HANA* • SAP Global Track and Trace
- Receive procured components into warehouse.
  - SAP S/4HANA* • SAP Digital Manufacturing Cloud*

**Manufacture (Subassemblies)**
- Schedule subassembly production.
  - SAP S/4HANA* • SAP Digital Manufacturing Cloud*
- Produce subassemblies and track progress.
  - SAP S/4HANA* • SAP Digital Manufacturing Cloud*
- Receive subassemblies into warehouse.
  - SAP S/4HANA* • SAP Global Track and Trace

**Manufacture (Finished Product)**
- Receive finished product into warehouse.
  - SAP S/4HANA* • SAP Digital Manufacturing Cloud*
- Produce finished product and track progress.
  - SAP S/4HANA* • SAP Digital Manufacturing Cloud*
- Register serialized finished product.
  - SAP S/4HANA* • SAP Asset Intelligence Network
- Schedule finished product production.
  - SAP S/4HANA* • SAP Asset Intelligence Network
- Produce customer sales order. (Assemble to Order)
  - SAP S/4HANA* • SAP S/4HANA*

**Deliver**
- Plan transport, pick, pack and load product for delivery.
  - SAP S/4HANA* • SAP Global Track and Trace
- Perform & track outbound transportation and receive proof of delivery.
  - SAP S/4HANA* • SAP Global Track and Trace
- Plan demand for new/changed components.
  - SAP Integrated Business Planning* • SAP S/4HANA*
- Plan supply for new/changed components.
  - SAP Integrated Business Planning* • SAP S/4HANA*

**Operate**
- Monitor assets with IoT data, perform analysis, predict asset failure.
  - SAP S/4HANA* • SAP Asset Strategy and Performance Management
  - SAP Pred. Maintenance and Service
- Plan asset maintenance.
  - SAP S/4HANA* • SAP Asset Manager
- Plan demand for new/changed components.
  - SAP Pred. Maintenance and Service
- Perform inspection, maintenance and repair.
  - SAP S/4HANA* • SAP Pred. Maintenance and Service
- Request product improvement.
  - SAP Asset Intelligence Network

**Sell**
- Receive asset master data and on-board asset.
  - SAP S/4HANA* • SAP Asset Intelligence Network
- Schedule finished product production.
  - SAP S/4HANA* • SAP Asset Intelligence Network
- Produce finished product and track progress.
  - SAP S/4HANA* • SAP Asset Intelligence Network
- Register serialized finished product.
  - SAP S/4HANA* • SAP Asset Intelligence Network
- Receive finished product into warehouse.
  - SAP S/4HANA* • SAP Asset Intelligence Network

**Create master production schedule.**
- Create master production schedule.
  - SAP S/4HANA* • SAP Planning and Consolidation

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* Represent product families, see subsequent slide for detailed material list

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Digital Supply Chain is Strategic to Transforming Businesses

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<th>TO...</th>
<th>WHY?</th>
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<td>Sales forecasting</td>
<td>Demand sensing</td>
<td>Product Individualization &amp; Heightened Customer Expectations</td>
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<td>Customer orders</td>
<td>Customer experience</td>
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<td>Outcome focused</td>
<td>Circular economy</td>
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<td>Big data</td>
<td>Intelligent analysis</td>
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<td>Responsive</td>
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<td>Linear supply chain</td>
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<td>Mass production</td>
<td>Mass customization</td>
<td>Competitiveness &amp; Differentiation</td>
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<td>Selling a product</td>
<td>Delivering a service</td>
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<td>Cost reduction</td>
<td>Increase revenue</td>
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FROM… TO… WHY?

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Leading companies across industries respond to market imperatives

CUSTOMER EXPERIENCE

Customer Centricity

Total Visibility

Business Innovation

PRODUCT EXPERIENCE
Customer Centricity
From selling products to selling customer experience

- Integrating all stakeholders, including suppliers, employees, and customers
- Precisely target customers with personalized offers in real time
- Leverage network of 45,000 retailers
Total Visibility
Provide Access to Data – in real time – wherever you are

- +64,200 turbines worldwide
- Streamline projects
- Deliver faster, more efficient, and more cost-effective wind turbine installation
- Get clean energy to the world more quickly.
• Collect real-time data about planting, soil preparation, fertilizing and harvesting
• Apply the right amount and concentration of fertilizer
• Sustainable processes
• Optimize crop yields while reducing waste
**Priorities in the manufacturing Industries**

**2025 Vision:**

**Addressing global challenges through tailor-made solutions delivered at scale and as a service.**

**Strategic priorities:**

- Customer centricity
- Digital Supply Networks
- Connected products
- Smart factory
- New business Models & Networks

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Delivering the Customer Experience with SAP Digital Supply Chain

- Design
- Plan
- Manufacture
- Deliver
- Operate

Applications

Reusable Business Services

IoT Application Enablement
Business Partner Services
Asset
Domain Specific Services

Security
Fiori & Mobile
Cloud
Multi-device

Technical Platform Services

…Partner apps.

…Partner services

…Partner extensions

Connecting Things

Processing Data

Store Data

Analyzing Data

IoT Services
Pipeline Engine
HANA
Analytics

Leonardo Edge
SAP Data Hub
SAP Vora
Cloud Storage
Machine Learning

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The world is changing

**IoT**

54%

Last year's growth in Mobile Data Traffic

**Digital Supply Chains**

50%

Of Manufacturing Supply Chains Will Have Benefited from Digital Transformation by 2019, with the Remainder Held Back by Outdated Business Models or Functional Structures

**Predict Maintenance**

1 Trillion

Will be saved in 2022 for consumers & business by IOT, for instance Predicting Hardware Maintenance

**Artificial Intelligence**

50%

cognitive and AI solutions spending predicted annual growth rate (CAGR 2016-2021)

**Digital Transformation**

40%

Of Digital Transformation initiatives will use AI services by 2019

**Machine Learning**

66%

Of analytics processes will no longer simply discover what happened and why, but prescribe what should be done


Gartner. Top Strategic Predictions for 2017 and Beyond
The World is changing..
Are you changing within?
Q&A
Thank you.

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