Design to Operate
Building a Resilient Supply Chain

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Agenda

The Intelligent Enterprise and Design to Operate

Design to Operate
- Overview
- Technology Highlights
- Find Resources and Influence D2O
- Demonstration

Key Take Aways

Q&A
Intelligent Enterprise

BUSINESS NETWORK
Across all functions

BUSINESS PROCESS

APPLICATIONS

TECHNOLOGY

INTELLIGENT SUITE
INDUSTRY CLOUD

SUSTAINABILITY MANAGEMENT

BUSINESS TECHNOLOGY PLATFORM
End-to-End Processes

BUSINESS NETWORK

Across all functions

BUSINESS PROCESS

Lead to Cash
Recruit to Retire
Design to Operate
Source to Pay

APPLICATIONS

INTELLIGENT SUITE

INDUSTRY CLOUD

SUSTAINABILITY MANAGEMENT

TECHNOLOGY

BUSINESS TECHNOLOGY PLATFORM
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Key Take Aways

Q&A
The Impact of Global Disruption
Supply Chain Risks and Vulnerabilities

**Demand volatility** for goods and services

**Uncertain supply** of critical materials

**Constrained capacity** in manufacturing & logistics

**Human risk** of balancing labor shortages and health and safety of employees

**Unpredictable downtime** as a result of deferred maintenance

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+29% Increase in spending in US groceries in March 2020

-27% Decrease in spending in US food service channel in March 2020

A Resilient Supply Chain
Predictive, Intelligent, Agile, and Digital

**Sourcing Strategies**
- Visibility across supplier network
- Source sustainable materials

**Optimized Supply**
- Identify materials in short supply
- Right-sized inventory optimization buffers

**Employee Health**
- Ensure environmental health & safety of workforce

**Demand Visibility**
- Accurate picture of demand

**Balanced Manufacturing**
- Balance of offshoring vs. near-shoring vs. on-shoring
- Plan for contingent workers

Digital Supply Chain Twin
Create a Resilient Supply Chain Insulated from Disruption

A systematic approach – or A methodical approach

**Respond**  
With agility and speed

**Recover**  
Prepare for growth after disruption

**Reimagine**  
Profitably predict, automate, and innovate
Recover to Prepare for Growth After Disruption

Design
- Make informed design choices with consistent product data
- Visually communicate product design to a distributed ecosystem

Plan
- Run what-if scenarios and simulations for faster decisions
- Balance inventory buffers and optimize supply

Manufacture
- Adjust production schedules to changed demand and supply
- Optimize your scarce available resources and labor

 Deliver
- Increase resilience in warehouses by deploying automation
- Address lock-downs with optimized scheduling and routing

Operate
- Ensure critical assets are available to service customers
- Switch from planned to condition based maintenance

Networks
- Design anywhere/build anywhere with remote collaboration
- Collaborate across supplier, logistics, manufacturing and asset networks
Reimagine to Profitably Predict, Automate, and Innovate

Customers + Employees + Shareholders + Environment

Deliver Perfectly  Work Productively  Grow Profitably  Act Sustainably
Resilient Supply Chains from **Design to Operate**

**Customer Centricity**
Close the Experience Gap

**Visibility**
Build Business Networks

**Productivity**
Focus on Industry 4.0

**Sustainability**
Engage in the Circular Economy
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Q&A
Design to Operate: End to end business process flow

**Design**
- Receive customer feedback – define requirements and system concept for new/changed product.
- Create product design, early cost estimates and master data for new/changed product.
- Hand over to manufacturing and service to manage BOM and routing.

**Plan**
- Plan demand for new / changed components.
- Plan supply for new/changed components.
- Create master production schedule.

**Procure**
- Procure components to build subassemblies.
- Manage and track inbound delivery.
- Receive procured components into warehouse.

**Manufacture (subassemblies)**
- Schedule subassembly production.
- Produce subassemblies and track progress.
- Receive subassemblies into warehouse.

**Sell**
- Receive customer sales order (assemble to order).
- Schedule finished product production.
- Produce finished product and track progress.
- Register serialized finished product.
- Receive finished product into warehouse.

**Manufacture (finished product)**
- Plan transport, pick, pack, and load product for delivery.
- Perform and track outbound transportation and receive proof of delivery.

**Deliver**
- Receive asset master data and onboard asset.
- Monitor assets with IoT data, perform analysis, predict asset failure.
- Plan asset maintenance.
- Perform inspection, maintenance, and repair.
- Request product improvement.

**Operate**
- Decommission asset.

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# Design to Operate: End to end business process flow

## Design
- **Receive customer feedback**
  - define requirements and system concept for new/changed product.
  - SAP S/4HANA Cloud for intelligent product design
- **Create product design, early cost estimates and master data for new/changed product.**
  - SAP S/4HANA*
  - SAP SD Visual Enterprise*
  - SAP Engineering Control Center
  - SAP Product Lifecycle Costing
- **Hand over to manufacturing and service to manage BOM and routing.**
  - SAP S/4HANA*
  - SAP Asset Intelligence Network
- **Create master production schedule.**
  - SAP S/4HANA*

## Plan
- **Plan demand for new/changed components.**
  - SAP Integrated Business Planning*
  - SAP S/4HANA*
- **Plan supply for new/changed components.**
  - SAP S/4HANA*
- **Create master production schedule.**
  - SAP S/4HANA*

## Procure
- **Procure components to build subassemblies.**
  - SAP S/4HANA*
- **Manage and track inbound delivery.**
  - SAP S/4HANA*
- **Receive procured components into warehouse.**
  - SAP S/4HANA*
  - SAP S/4HANA (EWM**)
- **Schedule subassembly production.**
  - SAP S/4HANA*
  - SAP Digital Manufacturing Cloud*
  - SAP Digital Manufacturing Cloud*

## Manufacture (subassemblies)
- **Produce subassemblies and track progress.**
  - SAP S/4HANA*
  - SAP Digital Manufacturing Cloud*
- **Receive subassemblies into warehouse.**
  - SAP S/4HANA*
  - SAP Digital Manufacturing Cloud*

## Sell
- **Receive customer sales order.**
  - (Assemble to Order)
- **Schedule finished product production.**
  - SAP S/4HANA*
- **Produce finished product and track progress.**
  - SAP S/4HANA*
  - SAP Digital Marketing Cloud*
  - SAP Asset Intelligence Network
- **Register serialized finished product.**
  - SAP S/4HANA*
  - SAP Digital Marketing Cloud*
  - SAP Asset Intelligence Network
- **Receive finished product into warehouse.**
  - SAP S/4HANA*
  - SAP S/4HANA (EWM**)

## Deliver
- **Plan transport, pick, pack, and load product for delivery.**
  - SAP S/4HANA*
  - SAP Logistics Business Network
  - SAP S/4HANA (TM***)
- **Perform and track outbound transportation and receive proof of delivery.**
  - SAP S/4HANA*
  - SAP Logistics Business Network

## Operate
- **Monitor assets with IoT data, perform analysis, predict asset failure.**
  - SAP S/4HANA*
  - SAP ASSET Intelligence Network
  - SAP Predictive Engineering Insights
- **Plan asset maintenance.**
  - SAP S/4HANA*
  - SAP Asset Strategy and Performance Management
  - SAP Pred. Maintenance and Service
- **Perform inspection, maintenance and repair.**
  - SAP S/4HANA*
  - SAP Asset Manager
  - SAP Pred. Maintenance and Service
  - SAP Predictive Engineering Insights
- **Request product improvement.**
  - SAP Asset Intelligence Network
  - SAP S/4HANA Cloud for intelligent product design
- **Decommission asset.**

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* Represent product families, see subsequent slide for detailed material list
** SAP S/4HANA Supply Chain for extended warehouse management
*** SAP S/4HANA Supply Chain for transportation management
From integration to integrated business processes
Illustrative view for Design to Operate guiding principles*

Digital Supply Chain – Design to Operate

Design Plan Manufacture Deliver Operate

Consistent User Experience & Digital Representation Along Product Lifecycle

Fiori Design One Launchpad SAP Analytics Cloud Data Layer Harmonization

LoB Business Applications

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SCP – Platform Services

Identity and Authorization Integration Services Portal Services Commercial Infrastructure Application Runtime Mobile Platform

SCP – Business Services & Applications

Asset Central Foundation SAP 3D Visual Enterprise Cloud

Provisioning Customer Setup & Configuration Integration Qualities & Operations

*some of these are on the roadmap
From integration to integrated business processes
Illustrative view for SAP’s internal Design to Operate technology standards

Digital Supply Chain – Design to Operate

Consistent User Experience & Digital Representation Along Product Lifecycle

Integration

Design Plan Manufacture Deliver Operate

Consistent User Experience & Digital Representation Along Product Lifecycle

Process Documentation
Enterprise architecture documentation (Industry Reference Architecture)
- Value flow
- Scenario implementation
- Software collaboration

Seamless UX
SAP Fiori 3 Design for cloud applications
- Visual Harmonization (SAP GUI, SAP WebDynpro)
- SAP Fiori Launchpad

One Master Data
Harmonized data foundation
- Consolidated data engine
- Common process and data layer

Identity Management
Single Sign On
- Single Sign On with SAML
- Integration with SAP Cloud Identity and Authorization Services (Cloud Apps)
Consistent Technology Guidelines

Technology Guidelines

- Ensure out-of-the-box integration, modularity, ease of extension, and consistent experience across the Intelligent Enterprise business processes

- Derived from customer requirements (Executive Advisory Board, Pilot Customers, Intelligent Enterprise Program, etc.)

- Centrally rolled out by Intelligent Enterprise Program Office and to be adopted by LoBs delivering applications for the Intelligent Enterprise business processes
Suite Qualities for the Intelligent Enterprise

Getting Started

Technology Guidelines (TGs) aid the out-of-the-box integration between SAP solutions. They provide architectural blueprint solutions, best practices, and how-to’s to address technical integration challenges such as master data exchange, extensibility, or consistent user experience.

Experts from all lines of business have jointly developed the TGs and continue to do so. This work is coordinated by the Intelligent Enterprise Technology team from Central Engineering headed by Michael Ameling.

TGs are grouped into the following six clusters and advocate or require the use of particular technologies such as Kernel Services.
Design to Operate Integration Overview
Check requests and derive new requirements. Create request

Task

Name: Check requests and derive new requirements. Create request

Reusable Process: [ ]
Start quantity: 1
Completion quantity: 1
Compensation: [ ]

Details for selected item: Integration Point
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Key Take Aways

Q&A
Integration Strategy Paper

Intelligent Enterprises Are Integrated Enterprises
SAP’s Integration Plan in the Cloud
As of February 2020

Listen, understand, and act upon market and customer-specific requirements to manage experiences end to end.

Customer Experience

Employee Experience

Experience & operational data collection at every touchpoint

sap.com/cloud-integration
Design to Operate Roadmap
End-to-End Process Blueprints

https://api.sap.com/
Experience and Influence: Your feedback is welcome

Customer Influence Platform
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Key Take Aways

Q&A
Industry 4.0 Now Design to Consume impressions
D2O from Discrete Industries to Process Industries

The life cycle of a valve for batch production

**DISCRETE ASSEMBLY**
Design and operate a discrete unit to produce and mix syrups

**BATCH PRODUCTION**
Develop a recipe for a concentrate, produce, mix and pack the product.

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**Design product and assemble it**

**Develop recipe and produce batch**

**IDEA**
FORMULATE

**PLAN**
intermediates / materials

**PLAN**
procure

**PRODUCE**
batch & packing

**DELIVER**
CONSUME

**MANUFACTURE**
components

**MANUFACTURE**
assemble and sell

**DELIVER**

**OPERATE**

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**DESIGN**

**PLAN**
components

**PLAN**
procure

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**LOW CO₂**

**MEDIUM CO₂**

**HIGH CO₂**
Design to Operate Vision Demo
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Key Take Aways

Q&A
Design to Operate – Building a Resilient Supply Chain

Key Take Aways

• Design to Operate represents key business processes, supported by the portfolio of SAP Digital Supply Chain

• Integrated supply chain solutions are key to realizing strategic goals of greater customer centricity, Industry 4.0, visibility through networks and sustainability

Design to Operate
5 key differentiators:

1. Intelligence built into business processes
2. Seamless Integration and UX
3. Digital Thread
4. Combine X and O data for optimal experience
5. Harmonized master data
Thank you.

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