The Digital Twin in Process Industries
From Integrated Engineering to Integrated Operations
SPACe Vietnam | Ho Chi Minh City | 6 May 2019
From record store ...

... to streaming
From taxi ...

... to ride sharing
Driving Digital Transformation
Leveraging Industrial DNA

Process Industries
- Chemicals
- Glass
- Marine
- Food and Beverage
- Electronics
- Aerospace
- Automotive
- Water and Wastewater
- Minerals
- Pharmaceuticals
- Batteries
- Wind
- Machine Building
- Intralogistics
- Oil and Gas
- Fiber
- Power and Utilities
- Tire
- Additive Manufacturing
- Cranes
- Robotics
Integrating and Digitalizing the Entire Value Chain
Siemens' unique Approach

Creating a powerful Digital Twin
Merging the virtual with the real World
Bridging the Virtual and Real Plant
Digital Enablement & Digital Reliability

**Digital Enablement**
- Design Data
- Simulation Data
- 1D / 2D / 3D Data
- Process Model Data
- Forecast Data
- Asset Data

**Virtual Plant**

**Digital Reliability**
- Alert Data
- Real Time Data
- Historical Data
- Optimization Data
- Equipment Data
eLog Data

**Real Plant**

**Digitalization**
Brings these worlds of information together
- ✅ Quickly
- ✅ Reliably
- ✅ Consistently
- ✅ Seamlessly

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Engineering & Operations Intelligence
Value-add across the Plant Lifecycle

**Handover**

**Change Management**

platform

Operations Intelligence
Brownfield Enablement
Managing your Asset Integrity

Brownfield challenge today

Capture
data from different sources

Consolidate
and validate data

Unify
and access common
asset data portal

Brownfield enablement approach

Documents and data from
different sources

Unstructured and unreliable
engineering data

Data inconsistency

Digital Twin enablement without disruption to existing physical or virtual environment

Horizontal & Vertical Data Integration
Holistic View on your Plant Assets’ Performance

Enterprise System and Platforms
Historian, ERP, CMMS, Batch,
Inventory, Sales & Finance

Control System and Engineering
PLCs, DCS, SCADA, Logical data,
P&ID, EI&C

Instrument and Devices
Field devices, sensors,
motors, Edge devices, workpieces,
tools etc.

Data hosted at different Operational Level

Horizontal Integration

Vertical Integration

Operations Intelligence

Engineering Intelligence

IOT Platform
Creating your Plant’s Digital Twin

Business Priorities driving Digital Agenda

Key Parameters

- SPEED
- FLEXIBILITY
- EFFICIENCY
- QUALITY
- SECURITY
Accelerated Start-up & ROI
Integrated Data Backbone

Time savings as a result of parallel working by the various disciplines

ISO 15926
Design
Basic Eng.
Detail Eng.
Constr. & Inst.
Commissioning

ERP System

Asset Lifecycle

Operations Intelligence

COMOS Plant Life Cycle Engineering and Asset Management
One Data Hub
COMOS Plant Life Cycle Engineering and Asset Management
One Data Hub

Integrated data management worldwide with COMOS Platform
- Consistency
- Productivity
- Profitability
- Interoperability
- Transparency
- Efficiency
- Quality
- Flexibility

Consistent plant engineering with COMOS Process

Fast & easy E&I Engineering with COMOS Automation

Secure asset management with COMOS Operations

Comprehensive information management with COMOS Lifecycle

COMOS – Making data work.

COMOS Plant Life Cycle Engineering and Asset Management
One Data Hub
COMOS Plant Life Cycle Engineering and Asset Management
One Data Hub

XHQ Operations Intelligence
Translating Disparate Data into Meaningful Information
XHQ Operations Intelligence
Translating Disparate Data into Meaningful Information

Digital Twin
Engineering & Operations Intelligence
Customer Reference
Business Performance Management & Intelligence System

- Single view to monitor and manage all critical business processes and activities
- Data integration technology to be real-time and data source vendor agnostic
- Integration of refinery systems and business applications (DCS, IP21, MES, LIMS, SAP, In-House Apps)
- Annual savings of 13.5M USD
Customer Reference
Unleash Business & Operations Data

1. Production
2. Safety
3. Profit
4. Maintenance
5. Receipts & Shipment (Planned)
6. Utility
7. Inventory
8. Receipts & Shipment (Actual)
9. Advanced Process Control
10. Plant operation
11. Energy Savings
12. Quality Control
13. Environment
Customer Reference
Production Monitoring in Pharmaceutical Batch Plant

Business Impact
Operations Performance Improvement

8%
Reduction in the operating costs

9%
Increase in facility utilization

2.5%
Increase in operational availability

11%
Increase in production
Thank you

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