MANAGING THE IIOT VALUE CHAIN

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Opportunities of the IIoT Value Chain Transformation

- Product Improvements
- Production Improvements
- Product Performance and Usage Data

Source: Enterprise IoT

- Targeted Sales
- Remote Services
- Remote Management
- Improved Support
- Digital Services
Where IIC and I4.0 are Adding Value

Testbeds
- Validate New Technologies and Concepts
- Foster Creation of Partner Ecosystems

Reference Architectures
- Provide Guidance
- Create a Common Language

Best Practices
- Accelerate Project Execution

Interoperability & Standards
- Enable „Things“ to Interact

Projects & Deployments
- Ensure Commercial Success
Where IIoT and I4.0 are Adding Value

- Testbeds
- Reference Architectures
- Best Practices
- Interoperability & Standards
- Projects & Deployments
Testbeds Help Driving Innovation

1st public IIC testbed: Track & Trace (Bosch, TechM, Cisco)
- 2015: From idea to commercial deployment in less than 1 year
- 2016: New use case „Forklifts“ (Bosch & SAP)

Value
- Validate technologies
- Blueprints for commercial solutions
- Generate best practices and standards
- Promote creation of partner ecosystems

Announcing today
- Bosch has joined Labs Network Industrie 4.0
- Support I4.0 testbeds
- Enable further collaboration between IIC and I4.0
- Foster integration of SME’s into IIoT value chain
Where IIoT and I4.0 are Adding Value

- Testbeds
- Reference Architectures
- Best Practices
- Interoperability & Standards
- Projects & Deployments
IIC and I4.0 Help Managing the IIoT Value Chain

RAMI4.0
I4.0 Reference Architecture

- Provides common language
- Maps physical to virtual world
- Covers product life cycle

IIRA
IIC Reference Architecture

- Provides common language
- Reduces complexity
- Ensures scalability
Where IIC and I4.0 are Adding Value

- Testbeds
- Reference Architectures
- Best Practices
- Interoperability & Standards
- Projects & Deployments
Best Practices Help Ensuring Project Success

Best Practice =

Reference Architecture + Project Experience

Need for

• Certified IIoT experts
• Tools and support for IIoT project managers
• Lean description of best practices
Complementary Approaches of IIC and I4.0

Cross-Domain Solutions
- Asset Operations Cloud

Manufacturing Focus in Depth
- Manufacturing Cloud

Plan ➔ Build ➔ Run
Type ➔ Instance
Holistic Approach for Interoperability

Cross-Domain Solutions

Prepare “Things” for cloud-based services already during manufacturing. For instance: plan sensor and gateway integration during forklift assembly.

Interoperability

Manufacturing Focus in Depth
**Tangible Cooperation Result**

**IIOT PROJECT TOOLKIT**

- Full IIoT *Action Pack* for each delegate at today’s event
- Request to use it and to provide feedback to tool-kit team
- Help capturing best practices

**I4.0 EXTENSION**
Where IIC and I4.0 are Adding Value

- Testbeds
- Reference Architectures
- Best Practices
- Interoperability & Standards
- Projects & Deployments
From Testbeds to Standards

- Production Performance Management (PPM) testbed: Bosch plant in Homburg
- Optimization of production performance: on-time delivery, OEE, energy utilization
- Open standard, derived from Homburg PPM testbed
- High relevance for both, SME’s and large enterprises
PPM Protocol Ensures Interoperability

PPM Protocol
- Easy to use
- Utilizes standard Internet technologies
- Open source

PPM
Data aggregation (digital twin) and conversion to KPI’s

PPM dashboard, advanced analytics, simulation

Machine components, sensors, ...

Energy, HVAC, building, ...

Industrial internet CONSORTIUM

BOSCH
Bosch Initiates PPMP Ecosystem

**Enterprise PPM Testbed**
- Production Simulation
- Enterprise System Integration (ERP, MES)
- RAMI4.0 Admin Shell Integration

**Micro-Testbeds**
- Sensor Data Integration
- Energy Data Integration
- Machine Data Integration

**Production Performance Management**

- BOSCH
- SAP
- DASSAULT SYSTÈMES
- TATA
- ECLIPSE
- BALLUFF
- EGT
- SCHMALZ
- KMW
- LUTZ
- RAMPF
- CADIS
- INDUSTRIE4.0

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Summary

- IoT transforms traditional industrial value chains
- Bosch already uses IoT solutions in own plants
- For broad deployment and accessibility especially for SME’s interoperability is key
- PPMP as an example for standardization through open source
- Bosch supports IIC and I4.0 consortia and their initiatives