MindSphere – Open IIoT operating system for critical infrastructure

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Content

• Siemens digitalization in brief

• MindSphere Industrial IoT operating system
  • Overview and architecture
  • Connectivity and security
  • MindSphere V3.0 on AWS demo

• Offering description

• Digitalization use cases from Finland
  • Value Hacker case studies
Today
Leading position in Electrification, Automation and Digitalization.

Employees
377,000+

Revenue
€82.9 billion

Net Income\(^1\)
€6.1 billion

Profit margin Ind. Business
11.2%

Key figures as of Oct 2017 1 Strategic Unit
Siemens has become a major player in digitalization

- 24,500+ software engineers
- A top 10 global software company
- 1 million+ connected assets
- 250+ Digital offerings incl. digital services and industrial applications
Clear focus on digitalization in R&D

€5.6bn
Estimated R&D spending in Fiscal Year 2018

+40%
R&D spending increase from 2014 to 2017
MindSphere
The open industrial IoT operating system

Typical IoT Platform layers

- **Software as a Service (SaaS)**
- **Platform as a Service (PaaS)**
- **Infrastructure as a Service (IaaS)**

**Industrial IoT Operating System**

- **Industrial SaaS**
- **Industrial IoT O/S**
- **PaaS**
- **IaaS**

**Production / Edge Computing**

+ Digital Domain Expertise
+ Long Term Investment Protection
+ Edge Management
+ Fleet Management
+ Digital Twin integrated use case
+ No vendor Lock-in
**MindApps**
- Use apps from Siemens, partners or develop your own
- Gain asset transparency & analytical insights
- Subscription based pricing model

**MindSphere**
- Open interface for development of customer specific apps
- Integration with 3rd party clouds and applications
- Various cloud infrastructures: AWS, Azure, Atos, SAP, Alibaba etc. offered as public, private or on-premise

**MindConnect**
- Open standards for connectivity, e.g., OPC UA
- Edge computing
- Secure and encrypted data communication
Strong open ecosystem emerging around partners

MindSphere

Consulting / strategic partners
- Accenture
- Tata Consultancy Services
- McKinsey & Company
- PwC

Technology providers
- IBM Watson
- SAP
- Microsoft Azure
- Accenture

Application developers
- SAP
- Senseye
- PwC
- EvoSoft

IaaS providers
- Microsoft Azure
- Amazon Web Services
- SAP
- Atos

System integrators
- Accenture
- OMNETRIC
- AtoS
- BluVision
- Tata Consultancy Services
MindSphere IIoT
Connectivity and security
Highly scalable, cost efficient

- Highly scalable, cost efficient cloud-infrastructure based on Cloud Foundry

Highest security standards

- MindConnect Elements based on ICS (Industrial Controls System) Security oriented to industry standard IEC 62443
- Unique MindConnect gateways with hardened and locked Linux based OS
- MindSphere Platform IT Security oriented to industry standard ISO 27001, IEC 62443, BSI
- Data in rest is located on SAP datacenters that comply to all required certificates
- Data in motion is always at least 256 bit SSL/TLS encrypted

Maximum confidentiality

- The customer controls these authorization levels and is the owner of this data
- Siemens acts a data custodian
MindConnect – Easy and integrated connectivity

MindConnect Main Characteristics:
• Dedicated IoT Connectors with MindConnect Nano, MindConnect IoT2040
• MindConnect embedded in standard Siemens industrial products, e.g. SINUMERIK and RUGGEDCOM
• MindConnect Software, APIs and Libraries for own integration into assets / devices

Key MindSphere Connectivity Suite Features

1. Dedicated IoT Connectors MindConnect Nano and MindConnect IoT2040
2. MindConnect embedded Agents in standard Siemens industrial products
3. MindConnect Software for every further product, including 3rd-party
STEP 1 CONNECT
Get MindSphere user account, receive and integrate Connector Box into machine / equipment

STEP 2 CONFIGURE
Configure data acquisition, connectivity and Visual Analyzer via MindSphere

STEP 3 GO
Monitor e.g. health status of all assets and drill into details using MindApp Fleet Manager

MindAccess User enables customers to get started quickly
MindSphere IIoT
Offering and selected MindApps
# MindSphere Offerings

**Designed to grow with your business**

## MindAccess IoT Value Plan

Use MindSphere applications based on ingested data – without development experience

Available in S, M, L

- Data ingest & storage
- Productive tenant
- Asset management
- User management
- Report on asset data
- Connect to almost every asset
- Access to MindSphere Store

## MindAccess DevOps Plan

### MindAccess Developer Plan

Develop applications on a test system

Available in S, M, L

- Cloud Foundry developer space
- Developer test tenant
- Basic APIs, including analytics
- Test asset and user management
- Developer data storage
- Developer cockpit

### MindAccess Operator Plan

Operate applications on a productive system and offer via MindSphere Store

Available in S, M, L

- Cloud Foundry productive space
- Productive tenant
- Basic APIs, including analytics
- Operator cockpit
- Access to MindSphere Store

## Additional Offerings

### Components

### Connectivity

### Apps

### Upgrades

### Services

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Page 15 11/8/2018

MindSphere Sales
MindSphere IIoT
Use cases
VALUE HACKER.

Creates business value.
From customer strategy to measurable business value

Value Hacker is an agile approach to discover value-add based on digital solutions.

Focus is in co-creation to tailor best solutions and achieve customer buy-in at an early stage.

Value Hacker is based on outcome economy – we succeed when our customers succeed.

Data-driven decision-making is key.
Customer description:
- A producer for agricultural industry

Project description:
- Phase 1: PoC implementation of a common IoT platform as a digital service connecting the feed production to Customer’s feeding systems.

Value Proposition:
- Production cost savings (energy etc.)
- New digital service offering (online reporting etc.)
- Phase 2: Further IoT development, Value Hacker consultancy and performance based development ventures.
Value Hacker Case Studies
Virtual Commissioning

Customer description:
• A large F&B producer in Finland and the Nordic/Baltic countries

Project description:
• Modernization of the Customer’s meat packaging line during a 4 day planned shutdown
• Virtual commissioning / validation (MCD)

Value Proposition:
• Tens of errors were found and corrected in the PLC code with MCD before commissioning
• A new, more efficient operating method was validated for the packaging machine
• On-time successful commissioning and further development of closed loop PLM with MindSphere has been started.
Customer description:
• A paper winder with an ongoing automation modernization project from ABB to Siemens

Project description:
• Siemens and a data-analytics partner have agreed to develop a PoC predictive analytics system in parallel to the modernization project. Objective is to increase the production speed of the machine and predict paper breaks based on collected data. LOI for Performance Contract under negotiations.

Value Proposition:
• Increased rate of production
• Lower maintenance requirement
• A structured IoT platform and data model enabling continuous development
Value Hacker Case Studies
Performance contract

Customer description:
• A large global food & beverage manufacturer

Project description:
• A 4-year cooperation and development contract with Siemens for improving production efficiency [EUR/kg] KPI

Value Proposition:
• All digitalization services are financed by Siemens and implemented as turnkey by Siemens
• The parties share the benefits of KPI improvement
• Net cash flow positive project for Customer
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