Digital Talk Industry
iExperience Center 4.0
Industry 4.0 Digital Transformation Hub for Universities Partners and Customers

Project Scope

- Creation of 3 Digital Demo Centers, at Siemens Alfragide and at University Campus in Leiria and Aveiro.
- All TIA and Digital Enterprise solutions are available for customers, partners and universities to test and validate added value Digital solutions.

- **TIA Solutions**
  - TIA Portal, SIRIUS, SIMOCODE, SINAMICS, SIMOTICS, SITOP, SIMATIC, SITRANS, IDENT

- **Secured Connectivity Solutions**
  - SCALANCE W, X, S, M

- **IOT Solutions**
  - SIMATIC IOT2040

- **PLM CAS Solutions**
  - MindConnect IOT2040
  - MindConnect Nano
  - IMindAcess IoT Value Pack

- **PLM Solutions**
  - SolidEdge
  - TecnoMatix
  - TeamCenter
Digitalization changes everything

The next trillion dollars will be earned with data – for our customers and for our industries.

Michael Dell, founder of Dell Inc.

Digital is the main reason just over half of the companies on the Fortune 500 have disappeared since the year 2000.

Pierre Nanterme, CEO Accenture
The only way producers can meet the essential market and customer requirements is through...

Speed

Flexibility

Quality

Efficiency

Security – Encryption | Firewall | Network segregation | Patch | Monitor

New Business Models - For continuous monitoring and optimization of complete value chain
How can Siemens support the change required for its Customers
Holistic Approach
The roadmap to Digitalization
A Holistic Approach

Digitalization Roadmap

Project phases

1. Strategic alignment & MOU
2. Evaluation & Maturity Check
3. Initiative identification & prioritization
4. Technical & commercial evaluation
5. Roadmap & implementation plan
6. Implementation

KPI and Painpoint Evaluation
Maturity check
Project prioritization
Detailed project, ROI Analysis
Implementation roadmap

Siemens Digital Solutions
Digital Enterprise Concept
Digital Enterprise is our portfolio of solutions for the digital transformation – in both discrete industry and process industry.

### Digital Enterprise

<table>
<thead>
<tr>
<th>Process Industries</th>
<th>Discrete Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product design</strong></td>
<td><strong>Industrial Software and Automation for discrete industries</strong></td>
</tr>
<tr>
<td><strong>Process and plant design</strong></td>
<td><strong>Industrial Communication</strong></td>
</tr>
<tr>
<td><strong>Engineering</strong></td>
<td><strong>Production planning</strong></td>
</tr>
<tr>
<td><strong>Operation</strong></td>
<td><strong>Production engineering</strong></td>
</tr>
<tr>
<td><strong>Services</strong></td>
<td><strong>Production execution</strong></td>
</tr>
<tr>
<td><strong>Services</strong></td>
<td><strong>Industrial Software and Automation for process industries</strong></td>
</tr>
<tr>
<td><strong>Industrial Security</strong></td>
<td><strong>Digital Enterprise Suite</strong></td>
</tr>
<tr>
<td><strong>Industrial Services</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Process Industries**
- Process and plant design
- Engineering
- Operation
- Services

**Discrete Industries**
- Product design
- Production planning
- Production engineering
- Production execution
- Services

Digitalization of the field level
Digital Twin
Discrete Industries
The most holistic Digital Twin

Design, simulate and verify products digitally, including mechanics and multi-physics, electronics and management of software.
Digital Twin Product

Design and simulate the product
NX and Simcenter
Simulate the physical behavior

Simcenter
The most holistic Digital Twin

Plan, simulate, predict and optimize production digitally with PLC code generation and virtual commissioning.
Digital Twin Production

Create the layout and select the equipment

Line Designer
Digital Twin Production

Simulate revolutionary designs with Additive Manufacturing

NX CAM Robotics and Multi-axis deposition
Digital Twin Production

Simulate working conditions for humans

Tecnomatix Process Simulate
Digital Twin Production

Simulate and optimize manufacturing assembly processes

Tecnomatix Process Simulate, Teamcenter
Digital Twin Production

Generate the PLC code in collaborative automation design

Automation Designer
Digital Twin Production

Validate the automation code in the virtual world

Mechatronics Concept Designer, SIMIT, PLCSIM Advanced, TIA Portal
The most holistic Digital Twin

Run production efficiently and securely with Totally Integrated Automation.

Collaboration platform
Fast and efficient engineering and commissioning

Totally Integrated Automation Portal

SIMATIC S7-1500

SINUMERIK 840D sl
Real Production

Realize revolutionary designs with Additive Manufacturing

Robot control with SINUMERIK and SIMATIC
Real Production

Schedule and execute work operations and quality inspections

SIMATIC IT Preactor, SIMATIC IT Unified Architecture
Feed back insights to optimize the Digital Twin of product and production in real world.

- **Digital Twin Product**
  - Virtual product
  - Specification
  - Verification

- **Digital Twin Production**
  - Virtual production
  - Commissioning
  - Validation

- **Digital Twin Performance**
  - Real production
  - Automation

**Insights from performance with MindSphere**

**Continuous improvement**

**Collaboration platform**
Digital Twin Performance

Monitoring of all machines – everywhere and anytime

Manage MyMachines based on MindSphere
COMOS collaboration platform provides a common data model to maximize the productivity for the entire plant lifecycle.

- **P&ID**
- **Electricals**
- **Instrumentation**
- **Piping**
- **Automation**

- **As built documentation**
- **KPI and Alarms**

- **Maintenance Data**
- **Operational data**

- **Plant hierarchy**
- **Mass-/ energy balance**
- **Process flow diagram**
- **Simulation model**
Harmonized synchronization for all process data sources
Augmented Reality
For simulation and training scenarios
Augmented Reality Simulation
During engineering, the Digital Twin of the plant is created, even before the real plant exists offering the possibility of an early 3D visualization of the plant, e.g. for training of service staff.
MindSphere
Cloud based Open IoT Operating System
Imagine this…

**MindSphere**
The Cloud-based, Open IoT Operating System from Siemens
### MindAccess Plans Landscape

**Small**
- **IOT Value Plan**
  - Small customers/ OEMs
    - 50 user/ 10 subtenants
    - 10 Agents (MindConnect)
    - Data storage 60GB
- **Developer Plan**
  - Small developers
    - Test & Develp RAM 2GB
    - Number developers 10
    - Outbound traffic 60GB
- **Operator Plan**
  - Small accounts
    - Number operators 5
    - Assets types/inst. 5/20
    - Outbound traffic 60GB

**Medium**
- **IOT Value Plan**
  - Worldwide installed base
    - 150 user/ 40 subtenants
    - 25 Agents (MindConnect)
    - Data storage 300GB
- **Developer Plan**
  - System integrators
    - Test & Develp RAM 10GB
    - Number developers 50
    - Outbound traffic 300GB
- **Operator Plan**
  - Mid size accounts
    - Number operators 10
    - Assets types/inst. 25/100
    - Outbound traffic 300GB

**Large**
- **IOT Value Plan**
  - Big international plants
    - 500 user/ 80 subtenants
    - 100 Agents (MindConnect)
    - Data storage 3TB
- **Developer Plan**
  - Software houses
    - Test & Develp RAM 20GB
    - Number developers 100
    - Outbound traffic 600GB
- **Operator Plan**
  - Large accounts
    - Number operators 25
    - Assets types/inst. 50/200
    - Outbound traffic 600GB

*Monthly fee*
MindSphere
Apps & Components
Applications for MindSphere are powerful industry applications addressing challenges and creating value

Applications for MindSphere

Hundreds of Apps are in development by Siemens, partners and customers

MindSphere Store

MindSphere Store, the MindSphere marketplace, is online and growing over time
MindSphere Demo
IoT Solutions
Simple, Smart, Scalable
SIMATIC IOT2040
The intelligent Gateway for industrial IoT Applications

SIMATIC quality
Designed for 24/7 operation in industrial environment

Automation.Connected
Easy connection to automation level with PROFINET*) and openness to cloud based solutions

Openness
Free programmable in high-level languages (e.g. Java, C++) via various IDEs (e.g. Eclipse) and compilers for Yocto Linux

Performance & Deterministic
Intel Quark® CPU and 1 GB RAM as well as x86-deterministic and battery buffered real-time-clock

Expandability & Connectivity
With mPCIe, Arduino Shields and various standard interfaces & available protocol drivers
SIMATIC IOT2040 Demo
Demo application as multiprotocol data aggregation device
MindSphere Partner
Small IoT Applications

• **Smart Real Time Location**

• **Smart Condition Monitoring**
  Machine Learning based

• No physical infrastructure
• Battery powered gateways for outdoor applications
• BLE Sensors
• Battery up to 9 years
• Equipment agnostic
• 3 axis motion monitoring (x,y,z)
• Pattern Evaluation
• Fast and simple ramp-up and implementation
MindSphere Partner
Condition Monitoring Application

Smart Sensor
BLE
Gateway
WiFi 2,4 GHz
Router
Access Point
Motor

Condition Monitoring App
MindSphere
WWW

Siemens
Ingenious for life
MindSphere Partner Demo
Condition Monitoring Application
Make the future yours
Thank you

João Queiroz
Digital Enterprise Coordinator
Phone: +351 96 613 5068
Email. joao.mqueiroz@siemens.com

siemens.pt   siemens.com/digitalization   mindsphere.io