Innovation for the Industry of the Future

CNI-SOSA Partnership meeting
Dr. Norbert Gaus | July 1, 2020
Innovation is the basis for success

R&D spending in billions of €

FY 2014: 4.0
FY 2019: 5.7
FY 2020e: ~5.8

+40%
Siemens drives IoT@ Scale

Design → Production/Construction → Operation → Services, Maintenance

MindSphere

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Page 3 June 2020
Dr. Norbert Gaus
Enhanced product design

Make digitalization work

Real-time simulation in Operation

Self-adaption for autonomous machines
# Seamless edge-to-cloud computing

<table>
<thead>
<tr>
<th>Backend (Cloud, on-prem)</th>
<th>IoT connectivity</th>
<th>Edge computing</th>
<th>Collaborative edge computing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Device management</strong></td>
<td><strong>MindSphere</strong></td>
<td><strong>Mass device management</strong></td>
<td><strong>System management</strong></td>
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<tr>
<td><strong>Edge</strong></td>
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<tr>
<td><strong>Field devices</strong></td>
<td><strong>Legacy devices</strong></td>
<td><strong>IoT devices</strong></td>
<td><strong>Interacting smart IoT devices</strong></td>
</tr>
</tbody>
</table>

- **Edge computing**
  - IoT gateway
  - Smart edge device
  - IoT devices
  - Smart IoT devices

- **Collaborative edge computing**
  - Interacting smart IoT devices
  - IoT chain
  - Industrial IoT Apps
  - Edge computing
  - Sensors

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Page 5  June 2020

Dr. Norbert Gaus
A framework for rapid adoption of industrial AI
Reusable AI building blocks to scale AI

Teaching trams to drive autonomously

Optimize & Analyze processing time and quality

Preventive Maintenance using AI for Oil & Gas
Remote Outage Support

Industrial AR-VR

Remote Factory Acceptance Test
The focus areas of our research and development

- Additive manufacturing
- Autonomous robotics
- Blockchain applications
- Connected (e)mobility
- Connectivity and Edge
- Cybersecurity
- Data analytics, artificial intelligence
- Distributed energy systems
- Energy storage
- Future of automation
- Materials
- Power electronics
- Simulation and digital twin
- Software systems and processes
Open innovation is the new normal – to bring more innovations much faster to the market

Crowdsourcing of ideas

Interchange and collaboration platforms

Open-source development model

Partnerships with universities and research institutes

Co-creation with partners, customers and start-ups

Cooperation with governmental partners
Open innovation is the new normal

Co-Creation with partners, customers and start-ups

Next47
POWERED BY SIEMENS

Foster collaboration with Businesses to grow start-ups and source expertise, Make Siemens “small”

CAPITAL
Invest in best start-ups

CREATE
Selectively create new businesses at market inflections

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Ingenuity for life

MindSphere Application Centers – Locations around the globe

20
MindSphere Application Centers

~70
Locations in ~20 countries across the globe

~1000
Software developers, data specialists and engineers

SIEMENS
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Thank you.