Unlock the potential –
Digitalize your building and plant infrastructure
Individual needs of building users ...

Comfort
High expectations of user-friendly offices, city districts

Quality of life
New offerings for municipal housing and city districts

Fit for purpose
Best conditions for hospital patients, airport travelers etc.

Unlock the potential

Digitalize your building

... meet new market drivers

IoT technology
Sensors, Data Analytics, AI

Adaptive infrastructures
Forward-looking and flexible buildings

Convergence of infrastructures
New business models

Decarbonization
Electricity as the #1 energy source

Unlock the potential

Digitalize your building
Diverse Roles – Different Requirements

**Owners**
- Higher capacity through flexibility
- Greater value generation
- TCO optimization
- More transparency through KPIs and dashboards

**Operators**
- Operational transparency and operation
- Higher availability of equipment and facilities
- Lower maintenance costs
- User-orientation: "Human-Centric Design"
- Integration of innovative solutions

**Commercial tenants**
- Employee productivity
- Workplace safety and security
- Greater comfort
- TCO optimization

**Project developers**
- Greater transparency and forward-looking development: 4D-planning and simulation/BIM
- User-orientation: "Human-Centric Design"
- Integration of innovative solutions
- Risk-minimized project realization

**City**
- Reduce emissions and integrate renewables
- Create livable city districts
- Energy efficient public buildings integrated into the energy market

**Architects/planners**
- Greater transparency for faster project completion and earlier conflict and error detection
- User-orientation: Integration of innovative solutions

**Distributors/installers/service companies**
- Digital engineering
- Modular and IoT-ready systems and devices
- Adaptive maintenance and proactive service offerings

**Grid operators/utilities**
- Strengthen customer relationships through added value services
- Integrate building infrastructures in supply strategies and energy markets

**Individual added value for building users**
- Diverse roles – different requirements
An Open and Secure Ecosystem

Open
- Secure cloud infrastructure and ecosystem
  - Open interfaces/APIs
  - Open standards
  - Plug and play
  - Open partner network
  - Cyber-Security “Charter of Trust”

Systemic
End-to-end solutions
- Scalability
- Definition of new value chains
- New data-driven services: predictive maintenance
- Cross-sector coverage

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MindSphere – The secure IoT Operating System

Sector-specific know-how combined with end-to-end solutions for optimized building performance and energy management

Applications and Services

Powerful applications and Digital Services

Closed-loop innovation with end-to-end digital twin

IoT operating system as digital service offering

Field devices and IoT connectivity across all domains and beyond

Building infrastructure

Totally Integrated Power

Totally Integrated Automation

Building devices for automation

Smart devices for energy

SCADA System

Controller

HMI

IPC

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Customized IoT Applications and Services

Integration of existing applications

Applications and Services

Bundling of selected applications and services for individual cases

Integration of existing applications

Navigator * powered by MindSphere: Migration end of 2018

Energy distribution

Buildings

Building Asset Performance
Performance Assurance
Building Optimization
Procurement Bill Mgmt.

Emission Reporting

Fault Detection and Diagnosis
Distributed Energy Optimization

Analytics Suite
Preventive Maintenance
Condition Monitoring
Power Monitoring
Energy Efficiency Analytics
Demand Response & Virtual Power Plants

Fusion of existing applications

Applications and Services

Sector-specific know-how combined with end-to-end solutions for optimized building performance and energy management

Easy integration with existing applications

Siemens applications

Development of own “3rd party” applications

MindSphere Application Center
Optimization of lifecycle costs
- Faster project realization
- Greater building quality
- Reduced design risk
- Minimized operational risk

“Perfect places”
- Intuitive operation: Space and user efficiency
- Energy and asset efficiency
- Comfort and safety
- Optimized service and maintenance process
- Critical power

New business potential
- Basis for data-driven business models
- Monetize new business insights
- Customer solution co-creation

Predictive planning & construction

More secure and reliable operation

Digitalize your building and plant

Develop New Data-Driven Services – Enhance Existing Processes

New business potential

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Smart City Seestadt Aspern

»Unique European project for intelligent energy consumption in a smart city quarter«

- 3 networked building complexes (housing, school campus, student home), energy provision on the basis of alternative generation, housing and school campus independently operable, building automation with predictive optimization
- Buildings fully integrated with the grid: 12 network stations with 24 transformers, >500 Smart Meters, >100 Grid Monitoring Devices, 6 storage batteries (each 100kWh)
- Networking of buildings and grid, central data station captures 1.5 million daily measurements in real-world conditions, continuous data analytics across domains
- Prototype demo-implementation (energy distribution monitoring) realized in MindSphere

More reliable and secure operation

- Up to 70% less energy consumption and CO₂
- Reduction in outage duration and cost in low-voltage grid

New business potential

- Greater building flexibility enables participation in the energy market: potential > €30 million in Vienna
Sello Shopping Center, Finland

»Data-driven services transform Sello into one of the greenest shopping centers in Europe«

- Remote Analytics: connecting 1,500 energy- and heating/cooling/air conditioning data points with a cloud-based building automation system
- Micro-Grid: 0.5 MW own solar electricity, 2 MW energy storage
- Demand response: enabling participation on the energy market
- Dedicated operations manager

More reliable and secure operation

- 50% reduction in district heating
- €118,000 p.a. savings in energy and maintenance

New business potential

- €480,000 p.a. profit on the energy market
- Emissions reduction of 281 tonnes CO₂ p.a.
Greater resilience for leading hospital in the UK

»Emergency power management for critical infrastructure«

- Reduce risk of power outages with fast load shedding by selectively disconnecting less important sections
- Manage backup generators in case of grid loss and restore all critical power loads < 1 min
- Solution based on redundant SICAM controllers utilizing GOOSE messages via IEC61850 for fast tripping

Unlock the potential

More reliable and secure operation

- Greater resiliency with energy restoration inside 1 minute
- Safe lives through minimized power outage time
- Avoid significant outage penalties
- Customer ready for distributed energy system
DB Schenker Head Office, Essen

»The Premium Office in action«

- Desigo CC building management platform: including 1,500 fire alarms, 40 Siport readers, video surveillance systems, Dali lighting control
- Individual quality and comfort with Premium Office: 560 Desigo automation single-room controllers
- Maximised transparency: fire alarm technology, building security, heating, cooling, air conditioning, lighting and dimming at a touch

More reliable and secure operation

| State-of-the-art energy management |
| Lower operational costs |
| LEED-certified |

Unlock the potential

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MindSphere in Action – Electrical Wholesaler REXEL near Linz, Austria

»New, data-driven business models«
- ISO 50001-compliant energy management at the Regro central depot (Austria)
- Energy monitoring system from the SENTRON portfolio connected to MindSphere
- Amortization of investment possible within two years
- Rexel offers its own customers energy consulting and implementation: development of a customized MindSphere application together with Siemens

Unlock the potential

- More reliable and secure operation
  - 15% savings through higher energy efficiency
  - Reduction of 60 tonnes CO₂ emissions

- New business potential
  - Development of new IoT services for customers
Project Gestamp – Power Management in Action – EnergyIP EEA application powered by MindSphere

»Saving energy with big data«
– Maximum transparency thanks to access to requested reports and dashboards via customized web portal
– All plants can be connected – globally applicable
– Continuous optimization of processes increases energy efficiency
– No invest due to managed service contract

More reliable and secure operation

<table>
<thead>
<tr>
<th>More reliable and secure operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>€5 m saved in energy bills (2 years cumulative)</td>
</tr>
<tr>
<td>15% energy reduction</td>
</tr>
<tr>
<td>14 locations online</td>
</tr>
</tbody>
</table>
Cybersecurity – a critical factor for the success of the digital economy

Key principles

1. Ownership of cyber and IT security
2. Responsibility throughout the digital supply chain
3. Security by default
4. User-centricity
5. Innovation and co-creation
6. Education
7. Certification for critical infrastructure and solutions
8. Transparency and response
9. Regulatory framework
10. Joint initiatives

charter-of-trust.com
Digitalize your building and plant – Unlock the potential

- Real estate
  Premium office
- Life science
- Food and Beverage
- Campus
  University
  City district
- Data centers
- Automotive
- Hotels
  Hospitals
- Machine building
- Chemicals