Turning innovation into strategic advantages

Siemens Innovation Day India 2019

Dr. Roland Busch | COO, CTO and Member of the Managing Board of Siemens AG

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What does it take to succeed in the digital transformation?

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Artificial Intelligence

Cloud

Data analytics

Co-creation

Connectivity

Speed & Scale

New business models

Computing power

Digital Twin

Cybersecurity

5G

Storage capacity

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Siemens IoT @ scale

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Siemens IoT @ scale = Unlocking customer value!

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Customer value
Internal | External

- Time to market
- Efficiency
- Productivity
- Asset management
- Availability

@scale

End-to-end cybersecurity

Easy to use, intuitive User Interface (HMI / UX)

Company Core Technologies (CCTs) / Capabilities

- Customer access (C-level)
- Domain know-how
- Software Suite, PLM
- Digital Twin

- AI and Machine Learning
- Domain know-how

- Software architecture
- Cloud development
- Low-code app dev. (mendix)
- Edge device management
- Edge architecture

RTOS- or Linux-based connectivity OS for all new Siemens devices, embedded

Siemens technology stack and ecosystem at work

IoT consulting | prototyping | co-creation | integration

PLM-Suite

MindSphere Application Center
20 verticals, 68 locations

Software tools, applications (mendix), industrial solutions driving value

References+

MindSphere – open, cloud-based IoT operating system
easy access to reliable industry hardened cloud services

Connectivity
High performant, low latency, 5G, easy plug and play, low cost

Io"Things" – Edge devices, products, PLC, MCU, sensors, actuators

3rd party "Things"

Ecosystem

- Atos
- Accenture
- TcS
- …
- 3rd party applications
- Co-creation with customers
- Amazon Web Services (AWS)
- Microsoft Azure
- Alibaba Cloud
- on-premise

Standards, Industrie 4.0, OPC-UA, BACnet, MindSphere World,…

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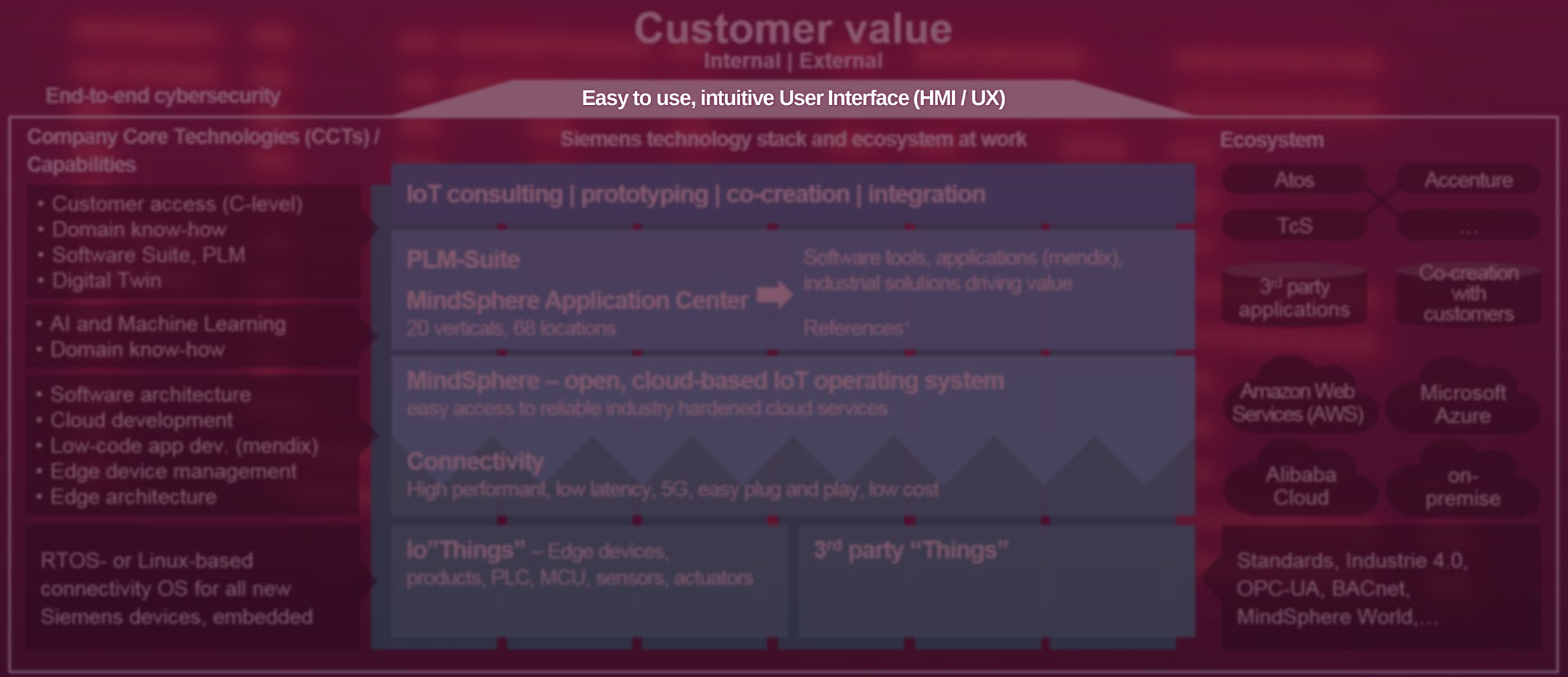

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Siemens smart city app connects Expo 2020 Dubai to the Internet of Things

EXPO 2020 DUBAI UAE | SIEMENS Ingenuity for life

OFFICIAL PREMIER PARTNER

MindSphere app collects, analyzes and visualizes data for intelligent decision making

Supporting Expo 2020 Dubai's targets for:
- Energy efficiency
- Visitor comfort
- Safety and security

Demonstrates potential to connect an entire city to the Internet of Things with MindSphere

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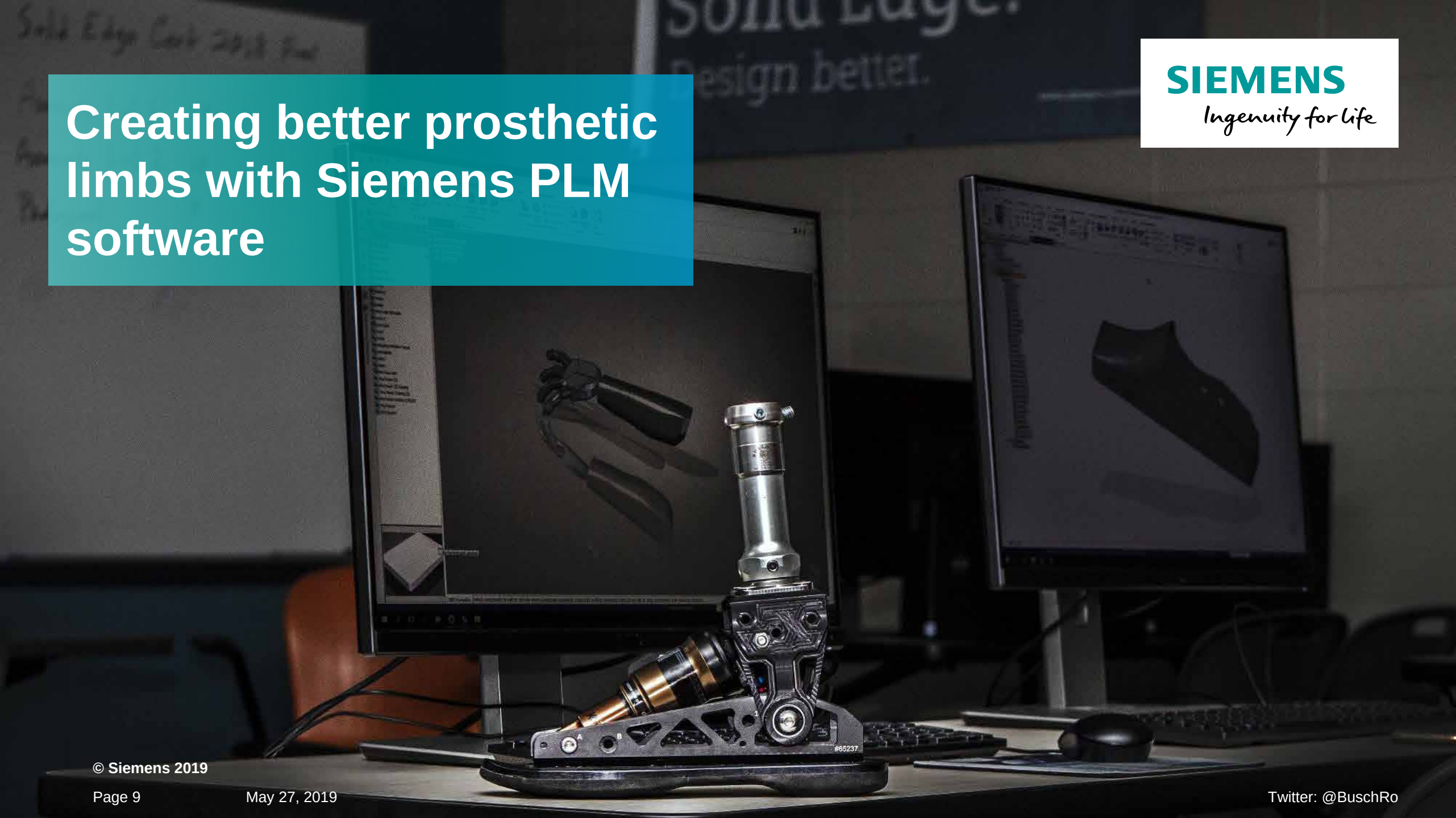
Creating better prosthetic limbs with Siemens PLM software



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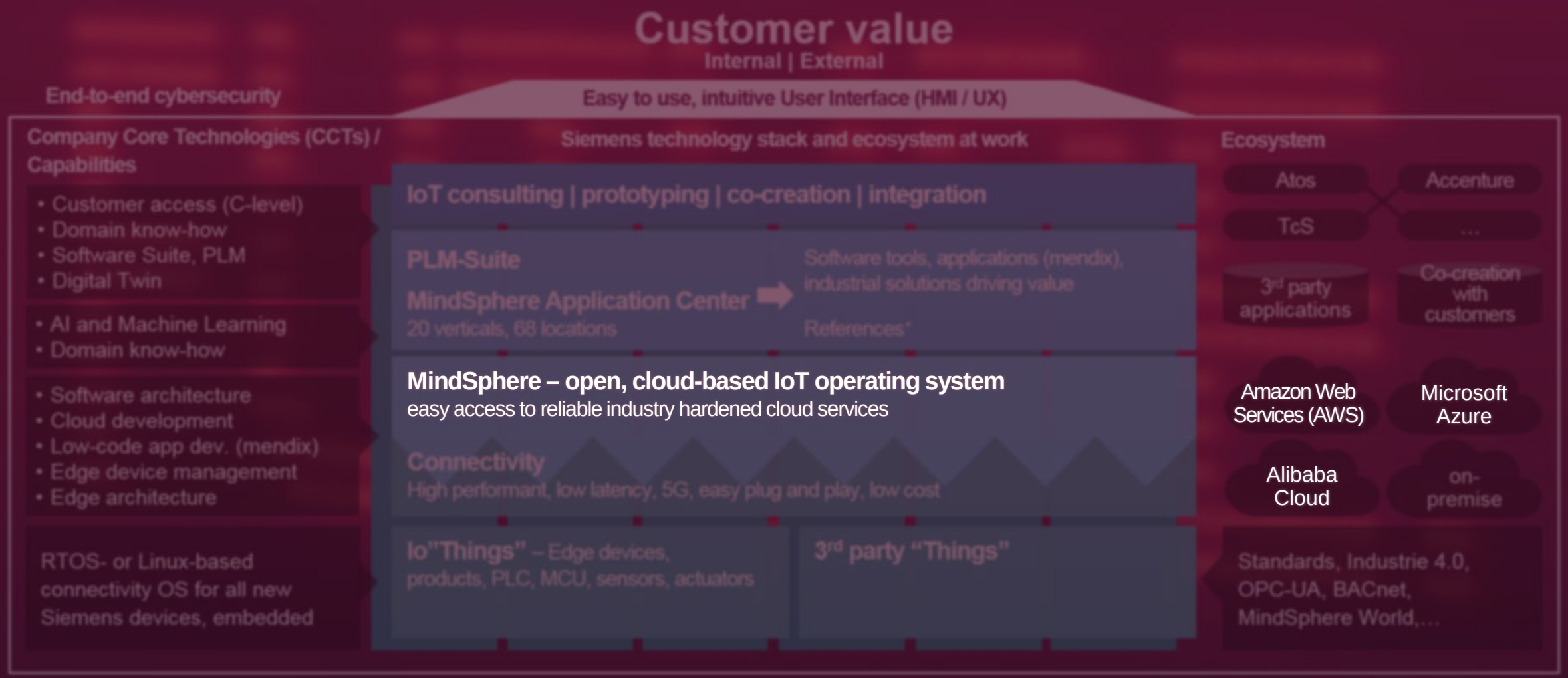

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Steadily growing ecosystem surrounding MindSphere – now running on AWS, Microsoft Azure and Alibaba

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MindSphere on AWS

- Since January 2018
- Worldwide

MindSphere on Azure

- Since January 2019
- Worldwide

MindSphere on Alibaba

- Since April 1, 2019
- In China

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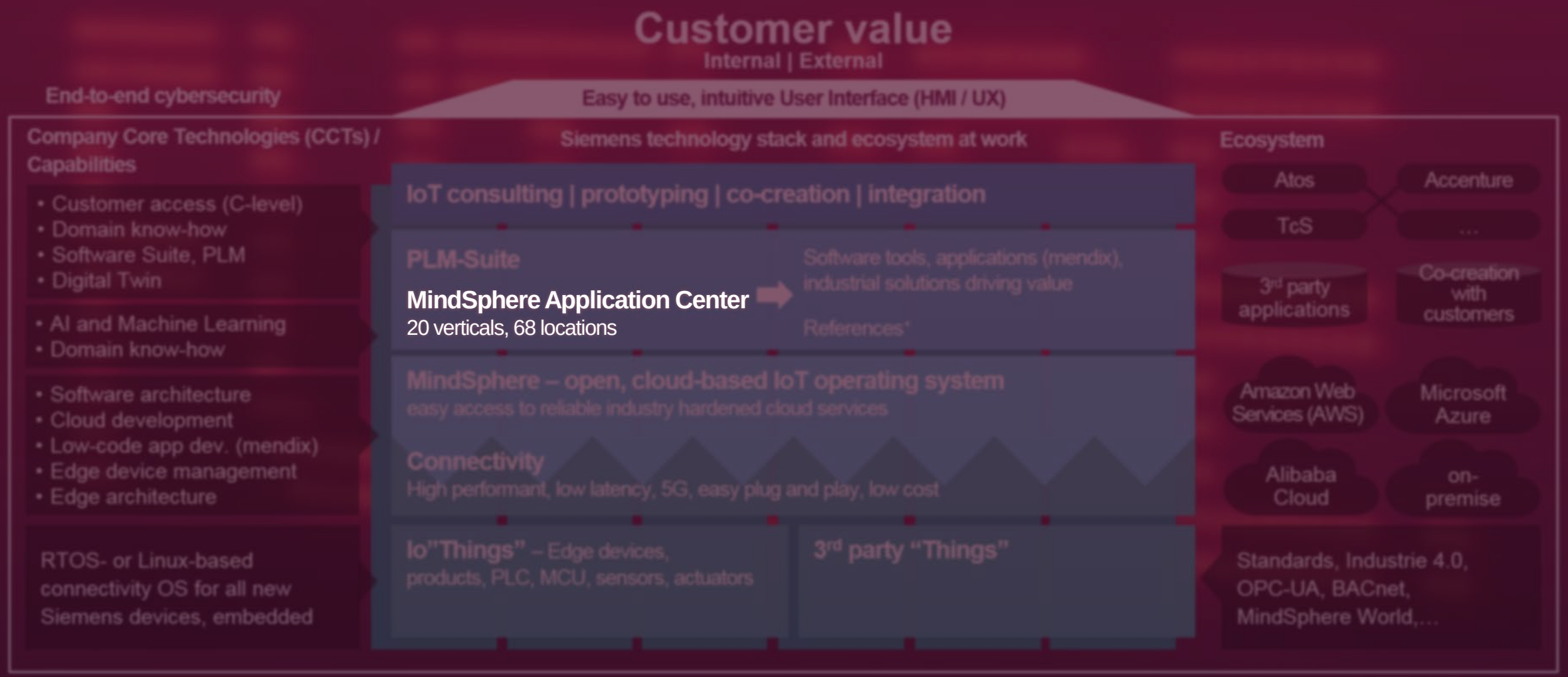

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MindSphere Application Centers – Locations around the globe

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20

MindSphere Application Centers

~70

Locations in ~20 countries across the globe

>1,000

software developers, data specialists and engineers

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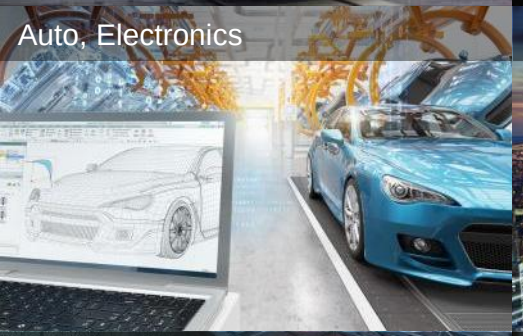

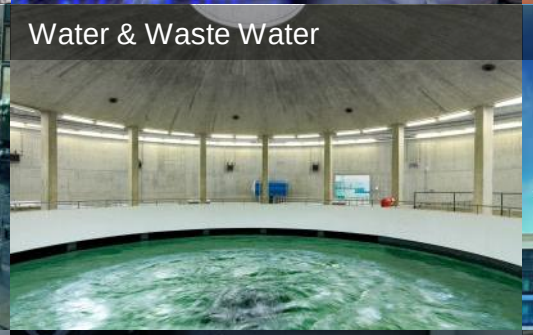

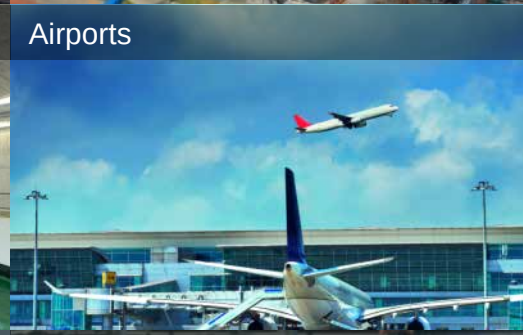

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Volkswagen also to cooperate with Siemens for Industrial Cloud

Siemens as integration partner ensures efficient networking of production systems, machinery, and equipment at 122 Volkswagen plants

Data transparency and analysis to lay foundations for further productivity improvements

Volkswagen, Siemens, and machinery and equipment suppliers develop new functions and applications together

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Global access to machine data, and new pay-per-use business model with MindSphere

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40% lower energy consumption in data centers with AI-based thermal optimization

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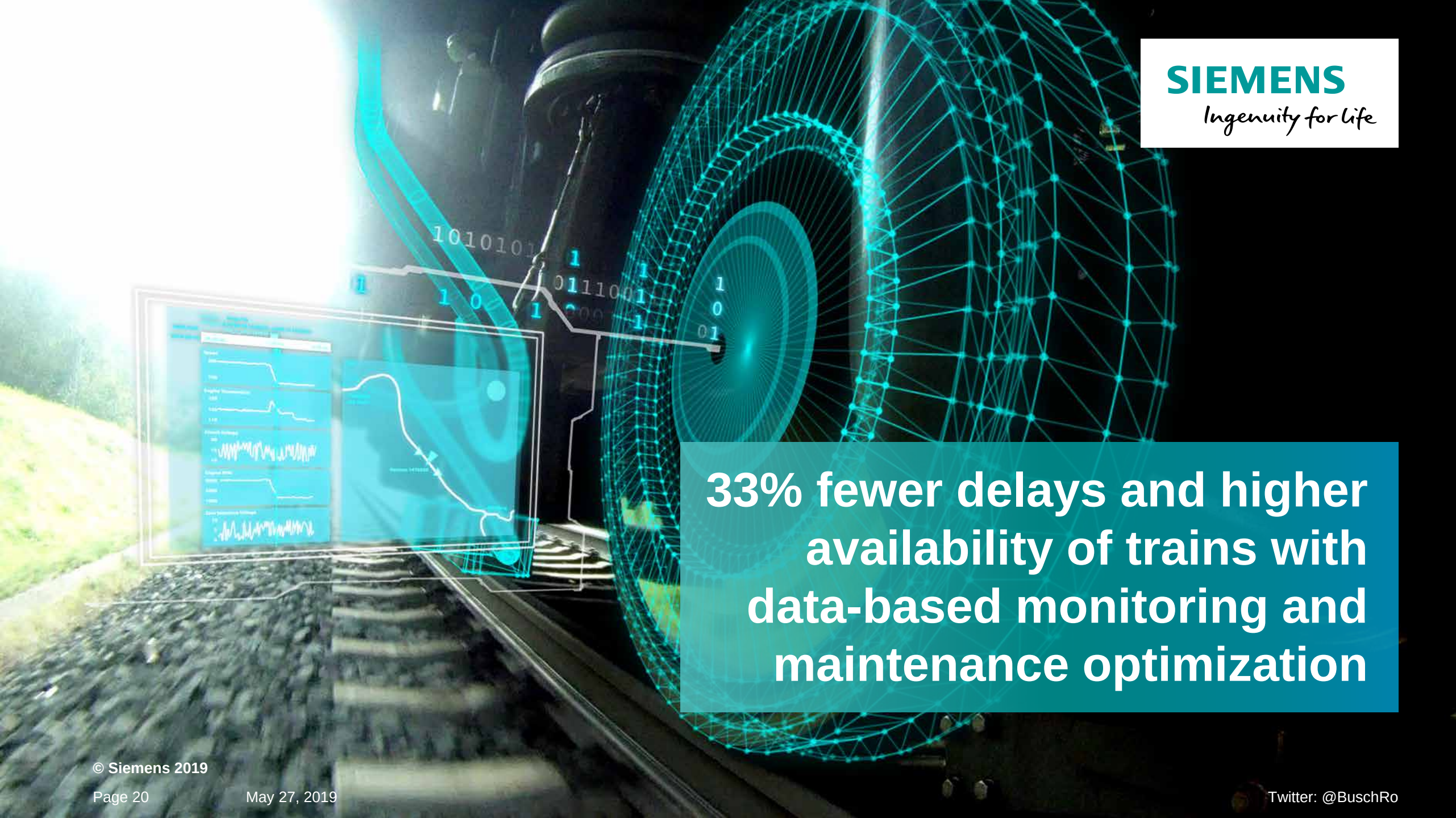

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33% fewer delays and higher availability of trains with data-based monitoring and maintenance optimization

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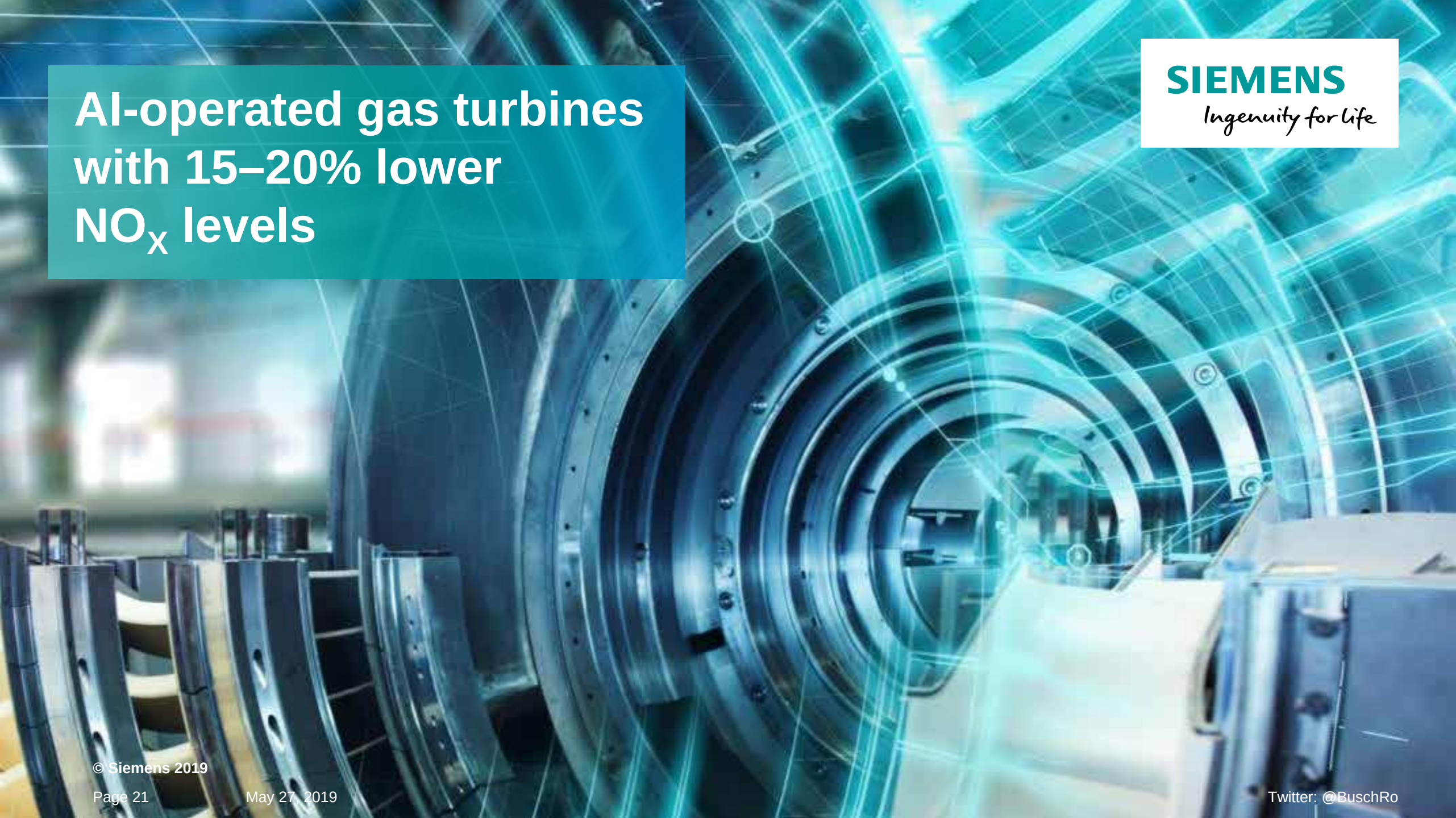

AI-operated gas turbines with 15–20% lower NO_X levels

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Digital twin and AI for smart motor surveillance and optimization

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Digital twin and AI for smart motor surveillance and optimization

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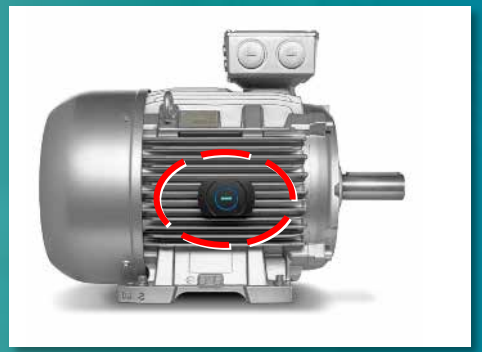
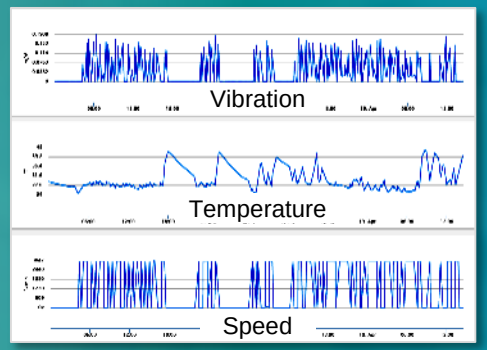
Smart Sensors



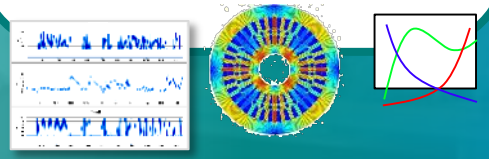
Signals and data

Temperature, acceleration, pressure, force, magnetic field, …



Data Analytics / AI

Cloud computing
Edge computing

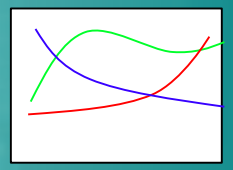


Motor status, torque, wear, …

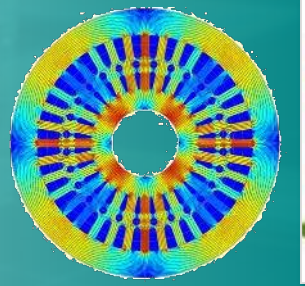
Operational Decisions

- Availability
- Performance
- Serviceability

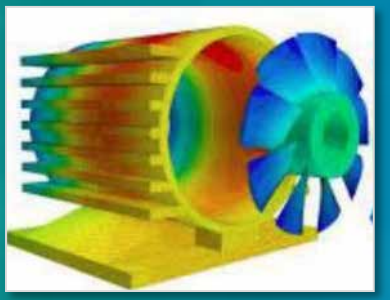
Digital Twin



Multi-physical models



Magnetic Field Simulation



Temperature Simulation

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Renaissance on the shop floor – a scalable concept up to the MindSphere Cloud system

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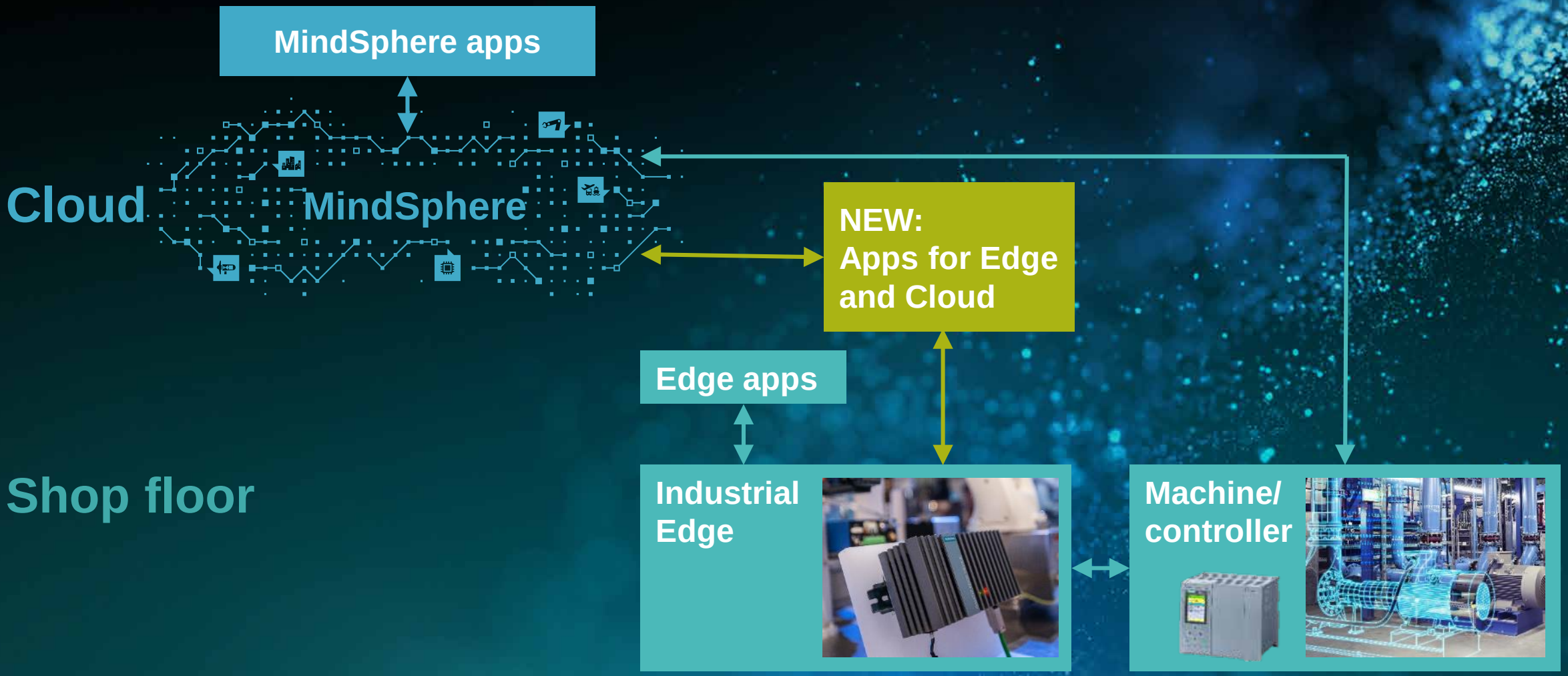

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Siemens Elektronikwerk Amberg – €200,000 annual savings through Edge Computing and AI

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The railway of the future
Norway: optimizing railway operations with digital signaling

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Today

- Technology from the 1940s-50s
- Limited capacity
- Train delays
- Obsolescence issues
- Limited data analysis possible

* Railway interlocking systems

11,200
Signals

330
Interlockings

10
Types of IXL*

15,000
km of cables

Trondheim

Migration

0
Signals**

1
Digital interlocking

1
Data center

3,000
km of cables

Tomorrow

- Shorter journey times
- Greater punctuality
- Higher flexibility
- More train departures
- Increased reliability
- Low maintenance
- … and safety at all times!

** only shunting signals

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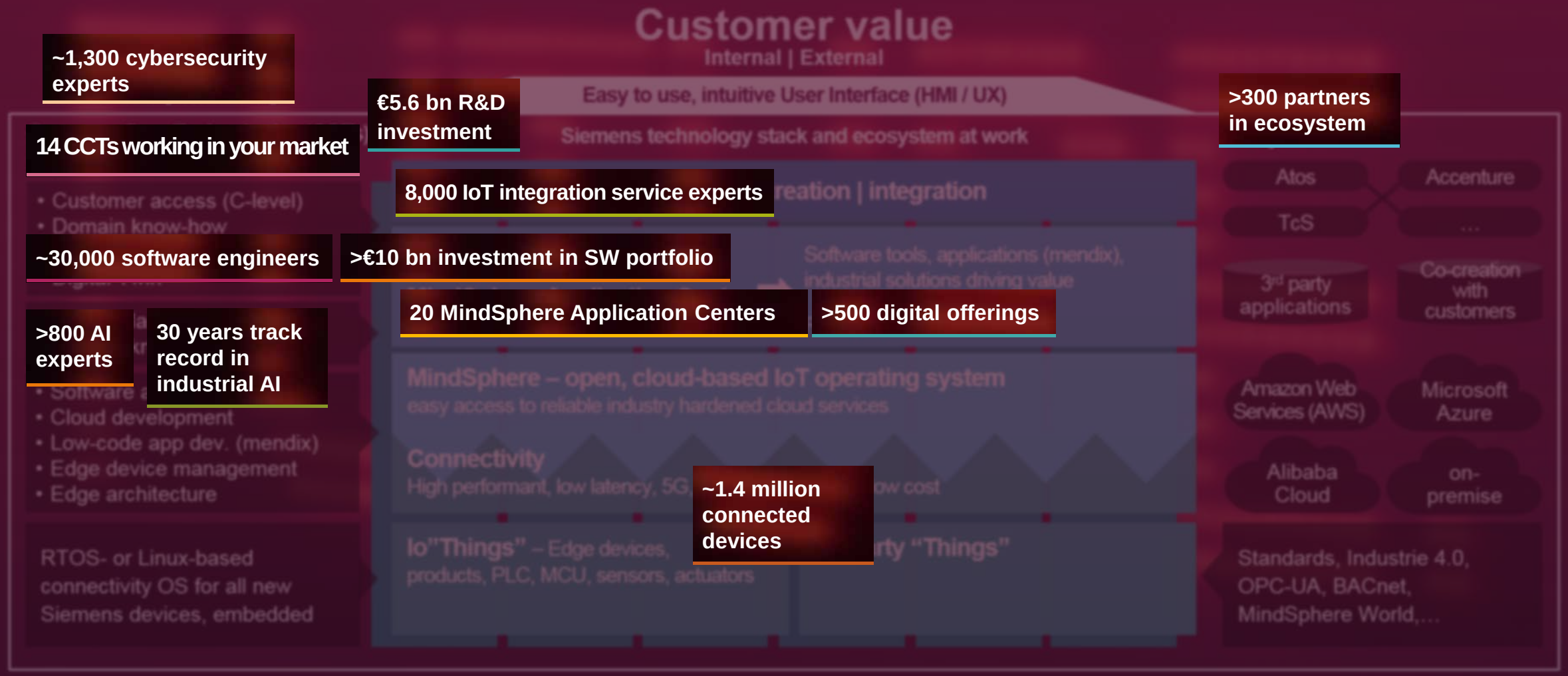
Siemens unlocks customer value with…



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Thank you

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