Data analytics of mobility systems for optimized operations
Optimized operations require 100 percent availability

The data available

- Rail vehicles today send between 1 and 4 billion data points per year
- Additional data: Work orders, spare parts data, geographical data, weather data

The challenge

Turn data into information and drive appropriate actions

Ensure 100% operational availability
Siemens provides digital services to improve availability of rail assets and support customers

1. **Smart Monitoring**
   Data transmission and visualization

2. **Smart Data Analysis**
   Data evaluation and analysis
In order to implement this portfolio, Siemens built a large team of experts supported by strong technological capabilities.

**Human Resources**
- Data scientists
- Technology experts
- Implementation managers

**Skill profiles**
- Data science
- Big data technology
- Platform architecture
- Mobility domain expertise
- Project implementation management

**Data management capabilities**
- Scalable data storage (MPP)
- In-database analytics
- Data quality validations

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The data platform is based on Sinalytics and is scalable, proven, and operational.

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<th>Data discovery</th>
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### Master data

### Data integration/data hub

### Data transfer

![Server Room](image-url)
Train data ensures “no surprises” for operations

Value drivers

- Improved maintenance
- Root cause analysis of failures
- Reduction of preventive maintenance cost
- Increase in availability

Why are we doing analytics? To ensure “no surprises” for operations!
Data from rail assets is analyzed to create an automated failure prediction: process example.
Data analytics models need to combine data science with domain expertise to guarantee customer value creation.

**Problem: Prediction of rare events**

**Data mining/machine learning**
- State-of-the-art algorithms
- Siemens’ intellectual property, several patents pending
- Innovative analytics approaches

**Deep domain expertise**
- Engineering knowledge
- System simulation results
- Design expertise

Validated action proposal from domain experts
Example: Data-driven model development for bearings

From manual data discovery … … to a dynamic machine-learning model
Data analytics of mobility systems for optimized operations

Thank you.