Innovation: Smart Services
Sustainability in the digital age

In the fast-paced and interconnected world of today, intelligent service technologies are at the forefront of innovation and problem-solving. These intelligent systems, often referred to as smart services, have the potential to change the way in which we live, work, and interact with the world around us. Intelligent service technologies are no longer futuristic concepts, but instead part of our present-day lives. They help us to face the challenges of the real world and provide practical solutions for a wide range of problems.

Added value in practical applications

Using cutting-edge advances in the fields of artificial intelligence, the Internet of Things (IoT), big data analytics and cloud computing, intelligent services have already made a profound impact. They provide useful insights, automate tasks and optimize decision-making processes, which ultimately improves the quality and efficiency of companies. GEMÜ uses the potential of this transformative power with a focus on innovative development and value-adding optimization.

Practical experience

In the interview below, Werner Flögel, Strategic Innovation Officer, spoke to four specialists about their experiences with using AI-based predictive maintenance, known as Smart Service. In an exciting and innovative undertaking, the project team aimed to detect wear on motorized actuators via vibration analysis and apply the solution they developed, comprising sensors, safe transmission technology and AI analytics, directly in the production environment.

DIFFERENT TYPES OF MAINTENANCE
⇒ Reactive: Replacing a component if it is defective
⇒ Time-based: Replacing a component at fixed intervals
⇒ Usage-based: Replacing a component after a defined number of operating cycles
⇒ Condition-based: Replacing a component when conditions are exceeded
⇒ Predictive: Replacing a component in good time if wear is detected
PROJECT SCOPE ⇒ Condition-based and predictive maintenance

GEMÜ

An exchange of experience between users and specialists

Werner Flögel: Thank you for joining me to talk about the topic of predictive maintenance as an exchange of experience between practitioners.
We have with us:

⇒ Andreas Walter, Teamleader Operational Services
⇒ Marcus Mager, Engineer, Global R&D, Research & Predevelopment
⇒ Marcel-Luca Nees, Operational Service, Maintenance, Support
⇒ Maximilian Backenstos, CEO of the company DatenBerg GmbH, service partner

Andreas Walter, in your view, what impact has predictive maintenance made on the company?

Andreas Walter: In my view, predictive maintenance makes a crucial difference for GEMÜ. Using data and analysis to make predictions about when machinery, units or components need to be maintained enables us to carry out maintenance before a failure occurs. This helps us to improve productivity and reduce maintenance costs.

Werner Flögel: It seems particularly important to me that we are able to achieve genuine added value. This requires the correct solutions and technical conditions. Marcus Mager, how do you support this and what role do you play in the development of solutions for predictive maintenance?

Marcus Mager: As a developer, I work closely with specialists in each application, and specifically in this project I work with maintenance specialists. However, I also work with data analysts to develop sensors and data collectors that provide suitable data for evaluation. The continuously measured data is prepared for use by machine learning technologies in order to detect patterns and predict when maintenance could be necessary.

Werner Flögel: This sounds like a complex process, but one that has become routine and has been mastered. Maximilian Backenstos, can you explain to us what you offer for predictive maintenance services?

Maximilian Backenstos: We work together with our customers to understand their systems and business processes. We then collect data from sensors and other sources to create models that can predict when maintenance is required. We also offer continuous monitoring and support to ensure that our predictions are precise and effective. In this project, for example, we base our work on international standards such as 10816.

Specifically, we use models with more than 30 KPIs to determine wear detection. It seems relevant to me in this regard that experience enables standardizations that encourage reuse and productive applications.

Werner Flögel: The developed technology seems to have been mastered. However, use of the technology requires specialists

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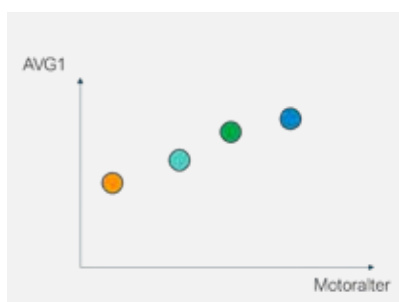### Data from the motor (Edge) STRUCTURE-BORNE SOUND SIGNAL
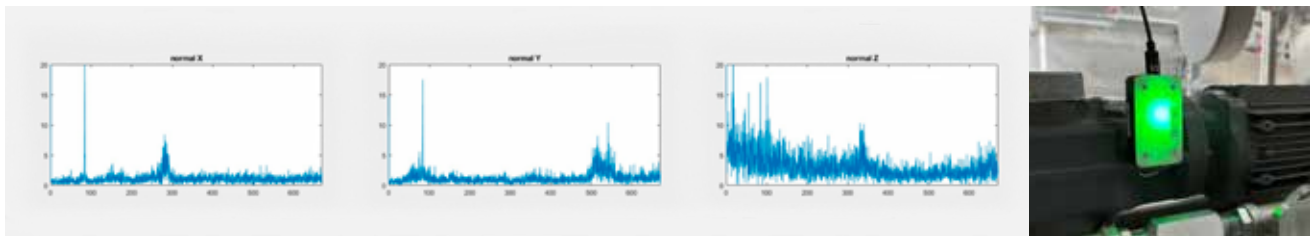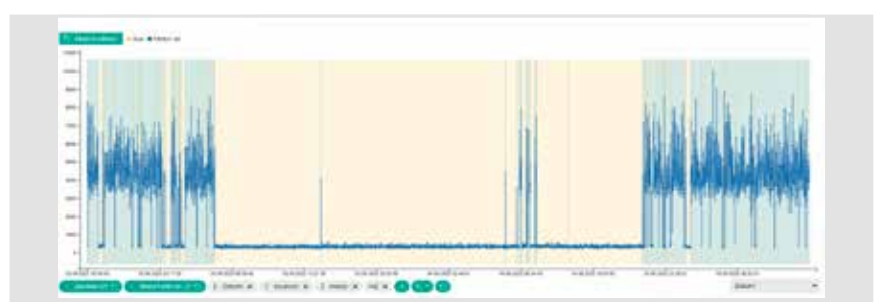

Sensor: Detection of vibrations and temperatures
Edge processing: Carrying out the Fourier transform and throttling the signal
Communication: Forwarding the data via MQTT network over WiFi

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Cloud evaluation (DatenBerg smartPLAZA software)

MANUAL ANALYSIS OF MOTORS

KPI ANALYSIS AND RANKING OF MOTORS

on-site to install the solutions. This brings us to Marcel-Luca Nees. How satisfied are you with the current state of the art? And can you tell us about your practical experiences in the course of setting up and installing sensors for predictive maintenance?

Marcel-Luca Nees: As a user in Operational Service, I have experienced first-hand how easy it was to install the components for predictive maintenance in our company. During the commissioning process, I was able to get an impression of how this modern technology can support productivity. To me, it is like an assistant that helps me to have controlled workflows rather than needing to deal with unplanned breakdowns.

Werner Flögel: A final word from Andreas Walter. Don't such positive impulses and future opportunities make you want to rejoice?

Andreas Walter: That is precisely where the progress lies. Whereas unplanned downtimes can be expensive and frustrating, predictive maintenance enables us to predict and prevent breakdowns, which improves our efficiency and reduces our maintenance costs. A motor that can be repaired via predictive maintenance is also more cost-effective and sustainable than procuring a new one. That is a true turning point for us.

Werner Flögel: Thank you for taking the time to share your experiences regarding this important topic with us. It is clear that predictive maintenance is an effective tool for improving the reliability of systems and reducing maintenance costs.

GEMÜ already uses artificial intelligence for Smart Service. It is only by implementing innovative ideas that we have the opportunity to discover new potential and opportunities. And: To gain experience that allow us to develop further.
The future belongs to Smart Services.