

Use Case Portfolio

AI powered SaaS solution for
Predictive Machine Maintenance

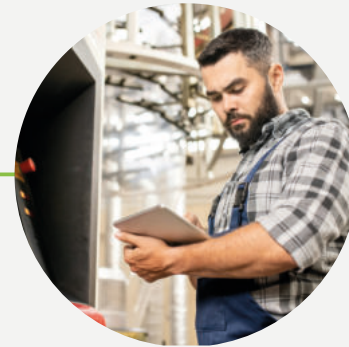
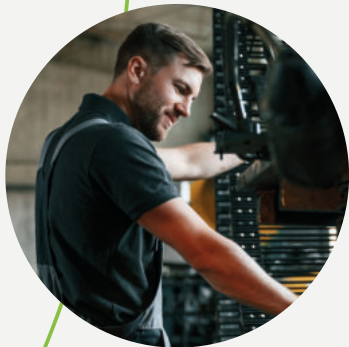




Photo: Oliver Vonberg

solution & industries

Our software serves as a digital maintenance assistant for machines, seamlessly blending an engineer's expertise with a powerful AI system.

Through a user-friendly dashboard, customers gain precise insights into machine status, enabling proactive maintenance to prevent costly downtime. The ai-omatic solution is utilized across diverse industries:

- Energy industry
- Automotive supply
- Pet food sector
- Plastic processing
- Packaging industry
- Tool manufacturing
- Chemical process industry



CANYON

Monitoring of gear motors



Initial situation: Two production lines for bicycles are in operation at the Canyon Bicycles production site in Koblenz. The gear motors of the conveyor belts, dating back to 2014, have already experienced costly failures. This prompted the company to seek innovative AI-supported maintenance solutions. With our software, Canyon also aims to address the significant challenges posed by the shortage of skilled workers in maintenance by implementing automated real-time monitoring. This approach replaces reactive or preventive maintenance measures, leading to more efficient utilization of financial and human resources.



Application of our solution: Specially adapted sensors are attached to the reference motors to continuously record measurement data. This data is monitored over months and sent to us for AI-based analysis. In the first step, we focus on recording high-frequency vibration data, from which we derive relevant characteristics such as vibration velocities and gearbox characteristics. As the project progresses, this data is combined with current operating status information of the drives, such as on/off status and speed. For data transmission, we utilize an edge device with an LTE connection that operates independently of the customer's IT infrastructure, enabling seamless integration.



Benefits: Thanks to the AI-based solution from ai-omatic, new perspectives are opening up for Canyon in addressing the shortage of skilled workers in maintenance. Andreas Weber from Canyon emphasizes that the team can now focus on other tasks, while monitoring and early warnings are provided by our software. This enables Canyon to react proactively to maintenance needs, saving not only human resources but also increasing the efficiency of the production lines. Additionally, our solution offers a user-friendly interface with real-time monitoring of machine status.



CANYON

Monitoring of gear motors



The future of maintenance poses challenges in terms of skilled labor.

However, with the AI-based solution from ai-omatic, the outlook is much more promising. The team can now divert their attention to other activities, as ai-omatic provides monitoring and early warning alerts.

Andreas Weber, Canyon



Monitoring of a grinding machine



Initial situation: PetCom, based in Minden, is a leading producer of pet food. In a section of the plant monitored by ai-omatic, raw materials are ground using hammer mills to create fine components. Subsequently, the ground material is lifted by elevators and separated by size using sieves. Previous undetected damage and breakdowns of these sieves have already resulted in significant costs. By implementing AI-based maintenance software, PetCom aims to primarily save on maintenance costs, reduce staff workload, improve maintenance planning, and increase efficiency.



Application of our solution: The operating data provide insights into the performance and temperature of the components, which vary depending on the specific recipe and degree of grinding. Our method optimally models these relationships by dividing the data into conditions (status/recipe) as well as monitored data channels (output/temperature), resulting in a generally applicable and scalable solution. Utilizing statistics and neural networks, the algorithm learns the typical operation of the machine, even with varying recipes, allowing for a clear distinction between normal and abnormal machine behavior.



Benefits: Our software enables PetCom to detect anomalies in sieves and elevators at an early stage, thereby preventing damage and downtime and ensuring a smooth production process. PetCom's requirements for a digital maintenance assistant, including cost savings and reduced workload for personnel, can be met thanks to our solution. Additionally, we provide expertise in sensor technology and data science to drive modernization and digitalization efforts.



Nitto

Monitoring a gravure printing machine



Initial situation: The Japanese company Nitto manufactures a diverse range of products, including adhesive tapes and medical technology. The technology of ai-omatic is utilized in highly complex gravure printing machines, where unwinding, printing, embossing, possible additional coating steps, and rewinding of the material are all integrated into a single system. The failure of even a single component can halt the entire operation. Nitto had clear objectives when implementing maintenance software: accurate predictions of failure risks, minimizing false alarms, and seamless integration of information into customer systems.



Application of our solution: The programmable logic controller (PLC) of the gravure printing press is a valuable asset, capturing not only basic operational data but also additional information such as temperature and vibration from critical components. This comprehensive data collection provides the ideal foundation for developing and implementing our innovative maintenance assistant. Analysis of 190 different data channels has revealed that the web speed of the system has the most significant impact on the behavior of critical components. This insight enables our maintenance assistant to accurately detect abnormal operating conditions even amidst fluctuating parameters.



Benefits: Our maintenance assistant predicted bearing damage during operation just 3 months after the initial implementation. Three weeks before the impending failure, the assistant identified increased vibration as a potential fault. This early detection allowed service technicians to confirm the issue one week later, prompted by our software, and perform the necessary maintenance. Nitto's need for maintenance software that detects and predicts quality failures in production at an early stage was fulfilled by ai-omatic's solution.



Nitto

Monitoring a gravure printing machine



„ai-omatic is forward-thinking. For example, the application of AI to real-time data has already predicted imminent bearing damage for one of our systems.

This enabled us to act at an early stage and avoid unplanned downtime.“

Dirk Schlamann, Nitto



Monitoring of gas turbines



Initial situation: Astora operates natural gas storage facilities with a capacity of around six billion cubic meters, representing approximately 25% of Germany's storage capacity. These underground facilities utilize several gas compressors, each powered by a gas turbine through a reduction gearbox—a highly intricate system. The failure of any single component can lead not only to significant financial losses but also to disruptions in Germany's energy supply. Implementing a digital maintenance assistant aims to reduce maintenance costs, alleviate personnel workload, enhance maintenance planning, and improve overall efficiency.



Application of our solution: Our AI-based maintenance assistant monitors a large number of machine parameters, such as temperatures, vibrations, speeds, and pressures, and analyzes their relationships. After months of intensive training, our software learns to recognize the normal behavior of the machine and detect deviations from this normal state.

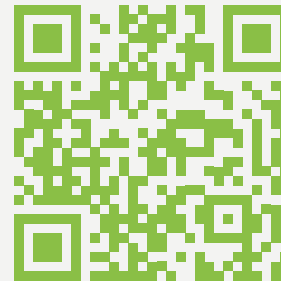


Benefits: The functionality of gas storage facilities, and their gas compressors, is crucial for a reliable energy supply in Germany. Our solution enables Astora to maintain an overview despite numerous data channels. Anomalies are displayed in the dashboard and can be investigated directly at sensor level. By integrating expert knowledge into our software, even employees with less machine knowledge can recognize anomalies. In this way, proactive measures can be taken, and unplanned downtimes avoided to ensure operational safety.

Any questions?

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