

Media Information
02 July 2025

"Just ask Factory Genius!": How AI helps maintain manufacturing equipment

+++ AI maintenance assistant Factory Genius speeds up troubleshooting at BMW Group +++ Pilot project at Plant Dingolfing forms basis of company-wide solution
+++ Methodology can be transferred to other areas

Munich. Whenever vehicle production equipment fails at a BMW Group plant, every minute counts. The maintenance team must work quickly to identify and resolve the cause of the fault. Now, employees can ask the new digital AI assistant, "Factory Genius", for help: It can suggest solutions for the specific system problem within seconds, reducing the time required for error diagnosis to a minimum.

"AI applications have become an integral part of modern production systems and are a key element of the BMW Group's digital transformation. Factory Genius is an example of how generative AI, in particular, can streamline operations for everyone involved and enhance economic efficiency," says Michael Ströbel, head of Process Management and Digitalisation, Order to Delivery at the BMW Group. But how exactly does the digital assistant, recently launched in its initial development phase, support maintenance staff?

Knowledge discovery tool

The tool essentially works like a search engine, quickly filtering relevant answers to specific user queries from a vast amount of data and user reports. However, this search function does not draw content and information from the internet, but from equipment manuals, quality data, internal fault reports and planning documents it was previously trained on. To keep the data management system up to date, it is

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regularly fed with new knowledge – for example, in the form of daily-updated shift-log data.

By integrating a Large Language Model, similar to those used in chatbots like ChatGPT and Gemini, Factory Genius is also able to understand language: The software can search data for relevant content within the appropriate linguistic context, providing more accurate results than a conventional search engine. In addition to displaying the top matches with links to sources, the assistant can also summarise the maintenance instructions found through contextual search in just a few sentences, if preferred. The user can then ask questions in a chat.

Collaborative in-house development

A pilot project in the body shop at BMW Group Plant Dingolfing laid the groundwork for this in-house development. Alongside the tool developed in Dingolfing in spring 2024, other BMW Group locations, including the plants in Spartanburg, USA, and Rosslyn, South Africa, were working at the same time on similar solutions through a transparent process. All were pursuing the same goal: improving access to information when faults occur or during scheduled training and maintenance. AI experts at the company's Munich headquarters consolidated this expertise, integrating the plants' diverse requirements to create a company-wide "best of" application. This can now be used globally in its initial development phase through an internal platform.

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In addition to search and chat functionality, Factory Genius also features a translation function, enabling it to switch languages at any time to overcome language barriers. This functionality has proven extremely useful while building the new plant in Debrecen, Hungary, for example, since manuals are often not available in Hungarian.

Transferable methodology

The technology behind Factory Genius has the potential to be applied to other production use cases as well. The general approach enables integration of a wide range of documents and development of assistants tailored to different user groups. Thanks to its cloud functionality, the tool will also be rapidly available worldwide.

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