

Media Information  
18 September 2020

## **Munich Pilot Plant: BMW Group uses augmented reality in prototyping**

- AR saves up to a year on vehicle module validation
- Assembly processes can be verified early and adjusted for series production

**Munich.** The BMW Group is using a new augmented reality (AR) application in vehicle concept and prototype engineering, speeding up the process by as much as twelve months, from individual vehicle sections through to complex production stages. AR goggles allow real geometries – on a vehicle body, for instance – to be overlaid with true-to-scale holographic 3D models, so a range of concept variants and assembly processes for future series vehicles can be assessed flexibly and cost-efficiently.

Michael Schneider, head of Complete Vehicle at the Pilot Plant: “The AR goggles and CAD data allow us to find out much more quickly whether the production worker will be able to fit the component properly later on, in series production. That way, we need far fewer test setups.”

Christoph Leibetseder, head of Digitalisation, Prototyping and Measurement Technologies at the Pilot Plant adds: “Another key advantage is that it saves us time and money when we integrate new vehicles into production.”

### **Vehicle concepts visualised in 3D**

Vehicles and their components are visualised on a platform linked to the BMW Group’s product data management system. CAD files of components are drag-and-dropped from the web-based database to the AR goggles, which the specialists can then use to reproduce the data in 3D and their original size in a realistic environment. The AR application is controlled by hand, allowing direct interaction with virtual components.

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With the AR application, a simple hand movement is enough to modify not only the size but also the position and angle of components. In addition, cross-sections can be created to provide a view of the vehicle's inner structures. Another advantage is the collaborative working: people at different locations around the world can now employ multi-user mode to team up and review designs and concepts together, and identify any errors.

### **Collaboration with start-up and research organisation**

As part of this project, the BMW Group is working with a Munich-based start-up and a research organisation. Work on developing and piloting the first augmented reality application commenced within a year at the BMW Group's Vehicle Pilot Plant in Munich. Research and methodology development focuses on cloud-based visualisations and smart object recognition.

### **Pilot Plant as a Competence Centre of the BMW Group**

The BMW Group's Pilot Plant is located in the Research & Innovation Centre in Munich, with three further associated facilities to the north of the city, in Hallbergmoos, Oberschleissheim and Garching. With a total area of 100,000 m<sup>2</sup>, it is home to 850 associates, who work on up to six vehicle projects simultaneously. Like the series plants, the Pilot Plant can assemble both electrically and combustion-powered prototypes. As the interface between development and production, it allows not only the product but also the series assembly processes to be refined to maturity, ready for transfer to regular plants where they are used in series production. The Pilot Plant comprises a bodyshop as well as assembly, prototype and concept car construction units, and the Additive Manufacturing Centre, a centre of excellence for 3D printing.

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**The BMW Group production network**

In 2019, strong customer demand and new models kept capacity utilisation high across the BMW Group production network. Production volumes for the BMW, MINI and Rolls-Royce brands reached record levels, with output totalling 2,564,025 units. Of those, 2,205,841 were BMW vehicles, 325,729 MINI, and 5,455 Rolls-Royce Motor Cars. Approximately 1 million vehicles were manufactured by the German plants.

Uniquely flexible and highly efficient, the BMW Group production network is able to respond quickly to changing markets and regional sales fluctuations. Expertise in manufacturing is a key contributor to the BMW Group's profitability.

The BMW Group production network uses a range of innovative digital and Industry 4.0 (IoT) technologies, including virtual reality, artificial intelligence and 3D printing applications. Standardised processes and structures across the production system ensure consistent premium quality and allow a high degree of customisation.

**The BMW Group**

With its four brands BMW, MINI, Rolls-Royce and BMW Motorrad, the BMW Group is the world's leading premium manufacturer of automobiles and motorcycles and also provides premium financial and mobility services. The BMW Group production network comprises 31 production and assembly facilities in 15 countries; the company has a global sales network in more than 140 countries.

In 2019, the BMW Group sold over 2,520,000 passenger vehicles and more than 175,000 motorcycles worldwide. The profit before tax in the financial year 2018 was € 9.815 billion on revenues amounting to € 97.480 billion. As of 31 December 2018, the BMW Group had a workforce of 134,682 employees.

The success of the BMW Group has always been based on long-term thinking and responsible action. The company has therefore established ecological and social sustainability throughout the value chain, comprehensive product responsibility and a clear commitment to conserving resources as an integral part of its strategy.

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