ZF Group

How ZF is transitioning to global digital operations. Tech company targeting multimillion-dollar savings by 2025.

As one of the largest Tier 1 automotive suppliers in the world, ZF supplies systems for passenger cars, commercial vehicles and industrial technology, enabling the next generation of mobility. ZF allows vehicles to see, think and act. In the technology domains of vehicle motion control, integrated safety, automated driving, and electric mobility, ZF offers comprehensive products and software solutions for established vehicle manufacturers and newly emerging transport and mobility service providers. ZF is electrifying a wide range of vehicle types. The company's products contribute to reducing emissions, protecting the climate and enhancing safe mobility. With some 157,500 employees worldwide, ZF reported sales of €38.3 billion in the 2021 fiscal year. The company operates 188 production facilities in 31 countries.

In 2020, ZF embarked on a mission to reduce controllable factory costs by integrating industrial internet of things (IIoT) solutions to improve quality and efficiency, and to increase its global manufacturing output. The company turned to PwC and Microsoft to build a scalable digital manufacturing platform (DMP) to drive digitalisation at 188 production sites across the world.

The first phase of the digitalisation programme called for an initial pilot project at the company's plant in Diepholz in northern Germany. This created an IIoT platform with common services and business applications, leveraging PwC Factory Intelligence and Microsoft Azure technologies.

The project followed three guiding principles. Firstly, the platform and enabling services needed to be built for scale. Secondly, the business solutions built on the platform needed to be relevant for most of ZF's plants, making them scalable too. Finally, the solutions needed to be useable by plants that were at less advanced stages in their digital transformation. Business applications and use cases were organised around three focus areas: the production control tower, end-to-end traceability, and maintenance intelligence.

Diepholz was selected as the first pilot plant because ZF's Car Chassis Technology Division had a well-established digital organisation that was capable of supporting the transformation. The team at the plant was also highly motivated to be front runners for the programme. Diepholz already had advanced levels of connectivity in place, and implementing the DMP offered considerable commercial potential.

The first focus of the project was transforming production to create better visibility into performance by developing automated KPI monitoring solutions and performance analytics use cases. Having these in place allows ZF to monitor performance and respond in real time.

The second focus was on end-to-end traceability that would allow ZF to quickly and easily trace a single product and/or batch through the entire production process. This helps the company to more accurately pinpoint where errors have occurred.

The third focus was on monitoring the condition of manufacturing assets in order to maximise uptime and optimise maintenance costs.

The DMP integrates data drawn from multiple sources, from machine level up to data from corporate enterprise resource planning (ERP) systems.

To develop the DMP, the company adopted an agile delivery and governance model, turning a traditional IT organisation into a product-centric agile one. All project members and plant experts worked on the basis of product increments (PIs) of three-month rolling planning phases and weekly sprints, allowing for regular reviews, alignment of responsibilities between the teams, and adjustments as implementation proceeded and the new target operating model was established.

Having proven the DMP's value at the Diepholz plant, the platform is now the cornerstone and key enabler for a multi-year digital strategy throughout ZF's global manufacturing operations.

However, the platform is not being rolled out to other plants in a conventional way. In the past, dedicated teams went from plant to plant to implement software solutions such as the manufacturing execution system (MES), but factories now need to be able to onboard independently and adhere to the DMP standards for themselves. The DMP organisation works with them during this process, providing standards, guidelines, checklists and support.

This approach to onboarding is simpler and allows a smaller workforce, and the ambition is to onboard each new plant to the platform within one week.

ZF is also seeking to broaden the functionality of the digital platform by enabling teams outside of the DMP to develop solutions on it. This will increase the number of use cases that can be made available for all plants, as well as giving plants the freedom to develop solutions that are specific to their needs.

When fully deployed across all ZF factories, the DMP is expected to produce annual cost savings of several hundred million dollars.

The solutions delivered at ZF have broad market potential for adoption across all manufacturing industries. The DMP provides a blueprint and best practice to drive digital transformation for automotive production and the Open Manufacturing Platform community as a whole, and the lessons learned at ZF can be used to accelerate any large-scale, smart factory transformation.