It's a car manufacturing plant, but not as you know it

This article takes a hypothetical look at what a worker's day in a car factory might look like in 2025.

Klaus is Head of Manufacturing for a German car-maker. The year is 2025. Although by no means a small operation, his company is not quite in the top five makers in the German market, and in any case, it must compete on the world stage, not just its domestic market. For that reason, it is under extra pressure to be extremely lean and efficient in its manufacturing processes from start to finish – it lacks the economies of scale of the market leaders.

Against this backdrop, Klaus persuaded his firm to push the boundaries of what is possible in terms of 'smart' manufacturing, as well as adopting the latest technologies and approaches that enable him and his team to work wherever it makes sense. One of the goals was to attract the very best talent to the organization, including the younger generation who are keener than ever to strike a work-life balance by having more flexibility in their working day.

In parallel, the company has made a huge investment in the past ten years in modern operational and information technology, and now, in 2025, he oversees a truly modern facility. The technology suppliers he relies on have adapted, too. More traditional service level agreements (SLAs) have been overtaken by suppliers who are able to put guarantees on the entire business function. This minimizes 'finger pointing' and gives far better peace of mind. As the factory has become an even more application-driven environment, a fully managed software infrastructure – that includes the likes of the knowledge of and proactive support of updates – is crucial.

Of course, by 2025 most cars are electric and many in the mid-range and upwards are fitted with self-driving capabilities: fewer cars, particularly on major roads, are being driven by their owners. The car of the future is even better connected: able to monitor, in real time, its own working parts and the safety of conditions around it as well as to communicate with other vehicles and with an increasingly intelligent road infrastructure. Electronic innovations have in fact accounted for the overwhelming majority of advances in modern vehicles.

In order to produce such vehicles, Klaus has overseen the development of one of the most sophisticated car factories in Europe. To build the essential systems that monitor the robotics and other processes throughout the factory, the company modernized legacy IT infrastructure so that staff are able to monitor and analyze equipment and processes in real time in a way that suits them – using tablets, mobiles, or even wearables such as smartglasses, smartwatches or augmented reality (AR) headsets.

While he and his team were upgrading the plant's facilities, they were able to collaborate with one another seamlessly wherever they happened to be and on whatever device they wanted to use. They used the latest in collaboration software and productivity applications coupled with holographics and virtual reality to 'walk through' various systems interfaces together, and make sure that the final applications were going to be both easy to use and effective.

On this morning, Klaus is working from home. The introduction of new-age technologies to enable remote working like Digital workplace, augmented reality and head-mounted displays combined with high-speed mobile networks, artificial intelligence and predictive maintenance has freed staff from having to be physically present in the factory on a regular basis – many work from home or on the road between plant, offices and suppliers. It improves their work-life balance, for one thing. But it is also particularly key because even more so than today, car manufacturers will be assemblers, not makers. To maximize efficiency they bring in high quality parts from specialist suppliers and using mostly robotics, piece them together and customize them for each individual consumer.

As assemblers, car manufacturers need to have full visibility of the supply chain. They need to know about issues that might affect the delivery of a component – for example a recent natural disaster near a supplier's factory –

and they also want to know about the standards that are in place for the safety and wellbeing of those suppliers' own staff. Indeed, they want to know that they are sourcing parts from ethical manufacturers, too.

Klaus is having a look at the overall health of the plant's manufacturing robotics and systems, but isn't expecting any serious issues, as the facility has a full suite of predictive maintenance capabilities built in, which should – in almost every case – create an alert that is sent to the relevant stakeholders, so that potential faults can be prevented before they occur. So far, so good: all of his main dashboards are glowing green in the plant and there are no alerts of impending issues.

Over a sandwich at lunch though he gets a ping on his smartwatch to say there is an issue with one of the paint robots. It hasn't stopped working completely but robots further down the production line are reporting minor inconsistencies in the paint surface that has been applied when the chassis gets to their area. Klaus and his team are going to delve into the issue further, so he contacts his assistant manufacturing head, Charlotte, who is on the factory floor running some visual checks, and fills her in on the alert that has been generated, sending a copy of his dashboard to her own augmented reality headset. Charlotte had just been in the process of carrying out some tests of her own with the AR headset in another area of the facility.

He sends the alert also to his data scientists so that they can start to investigate the data behind the scenes, comparing the latest measures and metrics to the averages in previous months or even years, to see where the issue might be occurring. They ping him back to say they're on it.

In 2025, teams still like to meet face to face, so after lunch Klaus checks his smartwatch – that informs him of an empty meeting room and the best location for his team to convene – and he makes his way to the plant to hold a team meeting and take a closer look for himself. Gathering Charlotte and the data science team into a meeting room he presses a button and a 3D representation of the robot in question is brought up above them. It's a 'digital twin' of the robot – a digital representation based on its precise measurements and movements as well as data coming off 750 sensors on the machine. The sensors are taking fraction-of-a-second readings constantly, capturing data such as acceleration, vibration, temperature, humidity, as well as various data related to the interaction between the robot and the car's chassis that it is working on.

Various red lights are flashing near the paint nozzle, and can also be seen intermittently in the tube that feeds the robot with paint. There are more warning signs on the panel of the car itself. "Any ideas?" Klaus asks the team. "I took a look through the AR headset but haven't see any obvious irregularities yet. It must be a very, very minor defect somewhere", Charlotte says

"It is," says one of the data scientists. "We couldn't see anything obvious but when we ran an artificial intelligence program over all of the data we got a red flag: there's an almost imperceptible difference in the molecular make-up of the paint today compared to the past week. We think somehow there is a slight problem with the paint itself. Not enough to stop production, but enough for the systems to flag an issue."

Within minutes Klaus has used his smartglasses to talk to his paint supplier and ask for a double-check on the next batch being sent to the factory. The various systems are updated so that the warning signs and alerts stop flashing temporarily while the last of the suspicious paint is used up, and an alert is set to begin monitoring again as soon as the new batch of paint is being applied.

Thanking his team he dismisses them and shuts down the digital twin, and has a quick conversation with his CEO - via their smartglasses. "Keep me posted on the new batch," says his CEO, "and if we get any more alerts on that paint we switch supplier immediately. It might be minor now, but these quality issues have a habit of escalating if you don't nip them in the bud."

"Many of the shifts outlined are just around the corner. Which is why we've shaped our vision of The Digital Workplace of the Future as well as Intelligent Engineering around them. Our vision is one of a simplified, intelligent workplace where everything just works. This workplace is powered by data, providing personalized, contextual and analytics-based artificial intelligence", said Fujitsu's Proposition Lead for Digital Workplace Services, Martin Smithen.

The last order of the day for Klaus is to grant approval for three AR headsets and two sets of smartglasses for use by contractors visiting the plant the following day. With a couple of keystrokes on his smartwatch authorization is provided through a virtual assistant, and they will be able to gain access to the plant using borrowed headsets that are kept in smart lockers which can be accessed any time day or night. After all, automobile manufacture is now a 24x7 operation. He drops them a message to let them know the drill.

Their devices will need to be returned and any data cached on them securely deleted before they will be signed back out of the building at the end of the day: but Klaus doesn't need to worry about this himself as it can all be handled by a 'connected vending machine'.

While highly automated, the plant must be kept highly secure at all times to protect the firm's intellectual property and the specifics of its market-leading manufacturing process. While contractors or other visitors are on site at the plant their exact movements are tracked at all times – indeed this is another way in which if an issue does arise within the plant, the right technicians nearest to the job and with the right skills match can be deployed very quickly, as Klaus and Charlotte know where they are and what they are doing.

With or without Klaus's intervention, the tracking system allows staff to be more agile, as well as to analyze and respond to events in a proactive and personalized way, all the time underpinned by artificial intelligence that can guide repairs and fixes where they are needed. The AI also frees up staff to work on higher-level assignments – optimizing the supply chain from end to end, for example – and just makes their lives simpler and more fulfilling. They have fewer mundane tasks to worry about and more flexibility.

The key to the plant's success is not just its use of robotics – though they have been honed further in recent years they are not particularly new technology. Instead, the advances that have made the biggest difference to the efficiency of the plant are in fact in the areas of predictive maintenance, a subset of the Internet of Things (IoT). Using the latest quantum computing technology, Klaus and his team of analysts and data scientists are able to keep track in real-time of thousands of parameters that could be trending towards a problem with some operational or information technology.

Ultimately though it has been Klaus' ability to remain fully connected to the plant, his team and even off-site consultants that has enabled him to solve such issues. It has been about being connected to the right assets, data and people he needs to do his job. Keeping the plant working smoothly 24x7 is vital if the company is going to remain competitive, and with the latest workplace technology he and the rest of the company's staff are freed to be more innovative and keep pushing the business forward.

"With 50% of the workforce likely to be millennials by 2025, it will be fascinating to see just where we can push the limits of technology and services to suit the entire workforce of the future," said Johan Cartens, Fujitsu's CTO for Manufacturing and Automotive. "Flexible, relevant ways of working with technologies that suit the worker, and adapt to their way of working overtime, will be invaluable to attract the best talent."

The future workplace will be a space for even more collaboration, creativity and engagement, enabling a connected workforce to have an exciting employee experience. Read everything you need to know about the future workplace here.