



From Vision to Impact

Enhancing Real-Time Connectivity and Agile Decision-Making in Automotive Manufacturing with Multi-Access Edge Computing

Background

The automotive industry, a modern manufacturing cornerstone, is undergoing significant transformation. New technologies, especially 5G and advanced computing systems, are at the forefront of this change, bringing about innovative ways to produce vehicles. Factories are becoming more agile and efficient by harnessing real-time data and integrating smarter systems. This not only streamlines operations but also reduces waste and resource consumption. As the industry continues to evolve, embracing these technological advancements is crucial. It ensures that manufacturers are well-equipped to tackle future challenges, capitalise on new opportunities, and set new benchmarks in automotive production.

The Company



With a presence in more than 20 countries, **Gestamp** is an international group dedicated to designing, developing and manufacturing metal automotive components. The Group specialises in developing innovatively designed products to achieve increasingly safer and lighter vehicles, thereby reducing energy consumption and environmental impact. Throughout its more than 20 years of experience, Gestamp has become a global technology provider characterised by its proximity to customers, ongoing innovation and strong internationalisation. Since its creation, Gestamp has moved from being a small local stamping company to a global company operating in the main auto manufacturing hubs. With the challenge of being at the forefront of innovation, Gestamp devotes a great effort to research and develop cutting-edge technologies. Therefore, innovation is the basis on which its future strategy is established.

"5G will allow the industry to respond in a much more precise way to the demands of today's society"

René González, Director of Advanced Manufacturing, Gestamp.

The Needs

For Gestamp, adapting to fast-changing customer demands and enhancing production efficiency are crucial needs. Implementing advanced systems like 5G and Edge Computing is essential. This technology would allow their factories to respond quicker to client-specific requirements by improving communication between different parts of the production process. With data processing happening almost instantly on-site, they aim to identify and solve issues faster, streamline their operations, and ultimately make decisions that are tightly aligned with customer expectations and market trends.

The Solution

Leveraging the provider Telefónica's advanced 5G and Edge Computing technologies, Gestamp has taken a further step towards digital transformation, creating the first digitalised factory with 5G in Spain to improve the management of industrial processes. This development is a key part of their strategy to create a smarter, more responsive manufacturing environment. Gestamp's smart factory is based on the digital twin concept: the plant has a virtual replica of its operations. This approach enhances production efficiency and decision-making by utilising 5G to connect physical components like robotic welding cells, ensuring real-time data capture and processing. The digital twin was actualised by integrating physical operations with 5G connectivity, ensuring immediate data relay and processing from diverse in-house systems. The adoption of Multi-Access Edge Computing (MEC) further streamlined this process, enabling on-site data handling, minimising latency, and offering a precise operational overview for strategic evaluations. A notable application of this integration involved connecting robotic welding cells, enhancing real-time communicative actions and operational intelligence within the factory's framework.

The Challenge

Several challenges emerge in Gestamp's transition to a 5G digital factory. Integrating cutting-edge 5G and Edge Computing with existing infrastructure requires careful orchestration to avoid production disruptions. The increased data flow necessitates stronger safeguards against potential security vulnerabilities. Additionally, ensuring the workforce is skilled in new technologies is vital to leveraging advanced systems effectively. These hurdles call for a delicate balance between innovation and operational stability.

The service provider

Telefónica Tech is a company focused on providing digital solutions to businesses. They offer services in areas like Cloud, Cybersecurity, IoT, Big Data, and Blockchain. With a straightforward approach to technology, they aim to assist clients in their digital transformation journeys. Working alongside various partners, Telefónica Tech seeks to deliver practical and efficient solutions tailored to the needs of modern businesses.





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Impact and Innovations highlight

The implementation of 5G with the edge computing service allows all the different devices and stations in the factory to be connected. Allowing the sending and receiving of information given a specific condition or alert enables real-time response actions. Furthermore, this comprehensive data ecosystem has been instrumental in constructing a digital twin, mirroring real-world scenarios for more accurate simulations and predictions. This integration of technologies and concurrent application of multiple use cases equip the smart factory with the agility and adaptability it needs for swift decision-making, thereby enhancing productivity and streamlining operations.

Future developments

Possible new developments could be oriented to achieving near-zero latency by integrating on-premise edge solutions with a dedicated 5G private network within the factory. This approach would allow Gestamp to ensure dedicated bandwidth for its operations, establish Quality of Service (QoS) parameters, and promote a wireless factory environment, accommodating the high mobility requirements of connected devices. Furthermore, there's potential to refine the digital twin model, enhancing its accuracy in reflecting real-time factory conditions. Expanding this smart factory model across other Gestamp locations could be streamlined and automated, thanks to the flexibility offered by edge computing services. This cloud continuum approach facilitates remote setup for each site, reducing operational costs while maximising the benefits of centralised cloud management.

Recommendations for policymaking

Based on this story, policymakers should focus on the following key areas to promote the adoption and scalability of Cloud-Edge-IoT solutions in this industrial domain:

► Standardise Connectivity Protocols:

Engage with Standard Development Organisations (SDOs) to collaboratively shape unified industry standards for seamlessly integrating 5G and edge computing in manufacturing.

► Enhance Data Protection Measures:

Enforce robust security regulations tailored to protect sensitive information within 5G-enabled manufacturing ecosystems.

► Invest in Workforce Upskilling:

Promote educational initiatives to equip the workforce with skills essential for advanced manufacturing technologies.

► Encourage Collaborative Innovation:

Building strong relationships with global tech providers can bring in expertise, innovation, and best practices from around the world. This not only enhances the quality of Cloud-Edge-IoT solutions available in Europe but also positions the continent as a leader in the global technological landscape.

Useful material related to this story

[GESTMAP: Connecting Industry](#)[Customer video testimonial](#)

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