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Embracing Digital Twins in the Automotive Industry: Interview with Digiflec

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Q&A with Digiflec

Source: Getty image/metamorworks

A digital twin (DT) is a virtual replica of a physical asset that uses real-world data and models to improve operations and aid in decision-making. It incorporates real-time and historical data, as well as engineering, simulation, and machine learning models. By creating a digital twin, the automotive industry can gain insights into the performance and behavior of physical assets, optimize operations and make more informed decisions.

The use of DTs in the automotive industry is expected to become more widespread as the digitization of vehicles continues to advance. DTs have the potential to enhance product design, manufacturing processes and vehicle maintenance, resulting in improved products and a more efficient and reliable automotive industry. As this evolution continues, a key priority will be ensuring functional safety and cybersecurity across various automotive processes. By addressing these requirements, the industry can fully leverage the benefits of DTs while maintaining the highest standards of safety and security.

To delve deeper, S&P Global Mobility initiated discussions with leading players in the DT market, including IBM, Ansys, ABB, rFpro, Digiflec and PTC. All are at the forefront of driving architectural shifts and pushing back the technical boundaries. Representatives of each company share their thoughts on the evolving landscape of DTs.

To gain further insights about Digiflec, we interviewed the director, Steven Gillan. Based in Scotland, Digiflec offers 3D lidar products and software solutions to assist companies in asset management and process automation. They are currently focused on developing a camera and lidar mobile road network survey solution for transportation networks.

The following is an edited transcript of the conversation.

S&P Global Mobility: What are the most promising automotive use cases for DTs?

Steven Gillan: The most promising use cases for DTs include optimising transport networks, enhancing efficiency, and improving scenario understanding. DTs can simulate demand on energy

networks and network movements, providing insights into safety and traffic in real-time. They also facilitate vehicle-to-infrastructure (V2I) communications, including with autonomous vehicles. Furthermore, DTs can enhance electric vehicle [EV] parking management and the operation of smart streetlights and signs.

How can smaller companies also take advantage of these opportunities?

Smaller companies can seize these opportunities as DT technology is still emerging and not yet widely adopted. This nascent stage offers a unique chance to introduce innovative solutions tailored to localities and communities. Smaller companies can position themselves at the forefront of innovation, unlocking new possibilities and driving growth.

Could you provide two or three real-world examples of where your company has experience applying DTs? And what were the savings in terms of time and cost?

Here are three examples:

1. Forestry and Land Scotland: We developed a mobile mapping system using LiDAR and AI algorithms to map over 10,000 km of rural roads. This innovation replaced the traditional, manual survey methods, resulting in more efficient route planning, resource allocation, and significant cost and time savings.
2. Tay Road Bridge/Dundee: By collecting live road user data for a DT for the Tay Road Bridge, we enhanced the operations of the bridge team. This solution provided real-time and historical insights into the bridge's traffic, replacing disruptive traffic loops that only provided historical data.
3. Thornhill/Stirling Council: In partnership with Stirling Council, we deployed the first commercial surround LiDAR traffic monitoring system in the UK. This system was installed in the village of Thornhill to provide detailed data on traffic volumes, vehicle types, speeds, and directions. The insights gained from this data helped to understand the impact of traffic on local air quality and improved traffic management strategies. This project demonstrated the potential of DT technology in enhancing community-centric solutions and contributing to environmental sustainability.

How is the DT scenario priced? Based on scenario complexity? Based on data size? Based on accuracy (number of sensors used to build the synthetic data)?

The pricing of DT scenarios depends on various factors, including the complexity of the scenario, the amount of data involved, and the required accuracy, which is influenced by the number of sensors used to gather data. Ultimately, the pricing is tailored to the specific needs and requirements of each project.

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