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A new day, a new technological feat: digital twin. What does it mean and how can it impact your construction project?

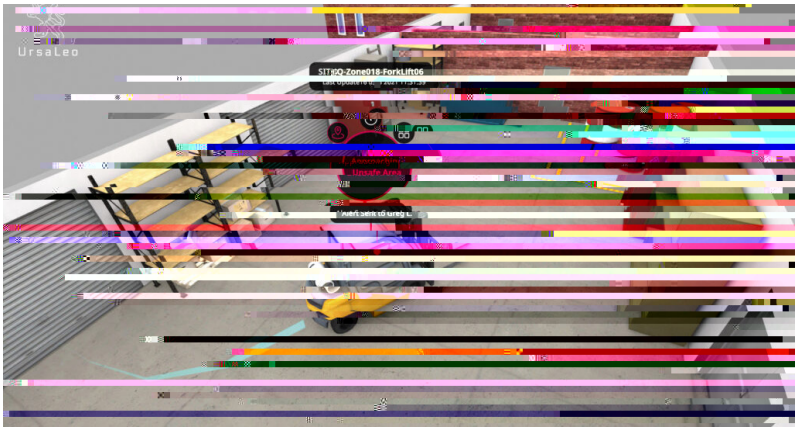
The new technology is certainly taking off across industries: the global digital twin market size in 2020 was valued at $3.1 billion and is expected to grow 58% (company annual growth rate) to $48.2 billion by 2026, according to ResearchAndMarkets.com.

But just what is a digital twin?

It means different things for different purposes, but fundamentally, it's a digital representation of an object in the real world, in real time, in a database, says John Burton, co-founder and CEO of UrsaLeo in San Francisco.

"Say we have a three-dimensional model of a construction site, like a computer model," Burton says. "We then combine that with data, such as workers' locations, safety status — capturing the data in real time to improve safety on the jobsite. We can also use the technical drawings of a building's various systems, and we cycle through various models to see how they are being completed in real time."

The digital twin can also aid in collaboration with other entities on the project to resolve any problems on-site, he says. Combining a 3D model with technical drawings and real time data enhances collaboration more so than showing someone a 2D picture of an object on an iPad.



"Our photorealistic 3D model of a construction site looks very much like the real thing, so there's very little learning curve — our solution is as intuitive as using a smartphone," Burton says. "If you can open a web browser, you can use this."

Digital twin technology is also valuable for ongoing maintenance after a facility has been built, he says.

"When an end customer is considering multiple bids for a construction project, offering them 3D models combined with data can give you an edge," Burton says. "In the future, if you don't have that capability, you could be at a disadvantage."

UrsaLeo built a digital twin model of the corporate headquarters of Volpatt Construction, a member of the Master Builders Association of Western Pennsylvania, that it used as a test environment, says Raymond Volpatt Jr., president of the Pittsburgh-based company.

"We installed sensors to track environmental data such as

humidity, temperature and air quality," Volpatt says. "We are also using the technology to monitor the safety of personnel within the office by monitoring their locations via Bluetooth beacons installed on their phones. This is a test to monitor the

"A company creating a digital twin during the design phase can turn over access to the client," Melton says. "It's a new handover product that aggregates data, connects project artifacts and provides simplified access when compared to traditional handover consisting of thousands of disconnected electronic file formats and PDF documents. They can hand over the digital twin like they're handing over the keys to the car so the client can start driving."

Digital twins that include a modern BIM approach are going to provide a new way to connect design and construction data to facility operations, he says. One of the best features of an intelligent 3D model is its ability to visualize complex information in a simplified way.

"Imagine using the spatial 3D model to visualize performance data and maintenance records for assets within a facility," Melton says. "This will provide the operators and maintenance resources at a facility a new way to collaborate and communicate."

Clients are being inundated with new types of design and construction data, such as electronic BIM files, and they're left wondering how to use that information once it's delivered, he says. Often resources within the clients' organization may not have the specialized software required to work with these types of files or don't have training on these applications to leverage the data in the most effective way. A digital twin with a modern BIM approach can help simplify the access to this information via a simple web browser, not requiring specialized software or much formal training.

A digital twin is beneficial when there are a limited number of experts who can physically travel to every site — utilizing a digital twin allows them to do their work remotely and collaborate better with onsite and remote staff, says Naresh

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