

Beyond the Model: Managing Your Completed Assets With Digital Twins

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A digital twin is a virtual exact copy of a physical object. But it's more than just a digital representation of a real-world project. Such a replica provides new ways to think about and manage projects (and assets) at a very fundamental level.

Digital twins are gaining traction among construction companies that have implemented building information modeling (BIM) – the “cousin” of the digital twin – and want to understand how different options and changes will impact asset performance over time. But its value goes beyond even working in tandem with the model.

That value speaks to the core idea behind digital twins: the ability to create virtual models that can process and generate data. All that continuously generating data helps to improve how existing assets are run on a day-to-day basis and also helps owners plan for anticipated growth and change within the asset.

Let's take a look at how digital twins can help streamline asset management once the keys are handed over to the owner.

Keeps Everything Operational With Tracking of and Visibility Into Asset Performance

Overall, a digital twin can help to improve the ongoing performance, reliability, and safety of a completed built asset, making it a valuable decision-making tool for supporting operations.



When integrated with real-time data from equipment and sensors throughout the structure, a digital twin enables facilities management teams to monitor equipment health status, equipment history, environmental conditions, and other data points throughout the life cycle of each component or system. Analyzing this data and simulating scenarios to identify the most efficient operating conditions can help reduce energy consumption, improve efficiency, and optimize internal environmental comfort and safety for occupants.

There's also a risk management component to digital twin-enabled asset management. Continuously monitoring the structural and functional health of an asset reduces the possibility of unanticipated problems arising in the future. But it also supports earlier detection of the flaws that do occur and

their root causes. This in turn gives teams the ability to quickly respond and act on an issue or inefficiency before equipment or components sustain any damage.

Improves Predictive Maintenance and Planning for Preventative Work

Maintenance, repairs, and corresponding downtime constitute a sizable chunk of an asset's operational costs. Minimizing their likelihood – and saving on those expenses – depends on being able to anticipate them and ideally prevent them from happening in the first place.

Using data from various sources, such as sensors and predictive analytics, a digital twin can identify potential issues, forecast maintenance schedules to proactively service equipment and systems – so everyone can plan and allocate resources accordingly. It can even simulate how, and how well, the asset will operate in different conditions.

What this does is put more asset management control in the hands of owners and their facilities management teams. So, armed with digital twin data, they're able to reduce the risk of failure and subsequent delays and costs while maximizing efficiency and prolonging the lifespan of the asset.

Tests Potential Changes, Updates, or Upgrades

We're now seeing existing infrastructure projects across the U.S. undergo retrofits, modifications, and upgrades to accommodate modern technologies, be brought up to code, incorporate new sustainability-friendly, energy-efficient systems, or simply be made more structurally safe.


There may be a need or preference to make such changes in the future to assets currently under construction. Consider these and other scenarios as a continuation of an asset's life cycle.

Having a digital twin helps plan for and manage such scenarios. Going through virtual simulations of a potential alteration provides an interactive way to experiment with and evaluate the impact of different options – on costs, occupants, the surroundings – in a controlled, low-risk environment before committing to any changes in the real world. This allows for faster, more accurate testing and troubleshooting of potential changes, updates, or upgrades to a completed asset.

Centralizes All Asset Data for Current and Future Use and Decision Making

Anyone who's ever managed a built asset without a digital twin knows that working with data distributed across multiple systems creates challenges for maintenance and enhancements to that asset.

Corralling all of that data into a single source of truth – the digital twin – creates a comprehensive continuum of asset intelligence. It's easier to access and understand the asset's construction and post-handover history and monitor the current state. Leveraging this data helps owners and their teams gain insights for future use – better informed asset management, proactive risk management, and maintenance that can help extend the lifespan and more confident planning for potential upgrades and modifications.

With a digital twin, owners can ensure the successful and long-term operation of their capital projects, maximizing the return on investment and minimizing maintenance costs. Taking advantage of this technology is a proactive and cost-effective approach to asset management, and one that is becoming increasingly vital in today's data-driven world. 



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