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# A new era in FM: Digital twins and BIM

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*Insight from Charlie Green, senior research analyst at Comparesoft*

In the dynamic world of technology, the concept of ‘digital twins’ stands out as a beacon of innovation and empowerment, especially in the realm of FM. These aren’t mere buzzwords; they’re transformative tools reshaping the very fabric of FM. But what exactly are they, and why are they so pivotal?

Understanding digital twins and BIM in FM

A digital twin, at its most fundamental level, is a dynamic, virtual replica of a physical entity or system. Whether representing a conference room, factory floor, or an expansive university campus, digital twins transcend traditional 3D visualisations. They are pulsating, digital mirrors of real-world entities, capturing every nuance and change in real-time. This is made possible through a network of sensors, IoT devices and data analytics tools that feed continuous information into the digital twin. For FM, this would mean an unparalleled ability to monitor facility conditions, predict potential issues, and make proactive decisions. Imagine detecting a drop in air quality in an office space and rectifying it even before the occupants notice, or predicting when a piece of machinery is likely to fail and scheduling maintenance in advance.

Building information modelling (BIM), on the other hand, is a detailed digital representation of a facility’s physical and functional attributes. Think of it as a building’s DNA, covering everything from design to electrical details. It’s a shared information hub that stakeholders can access and update throughout a building’s lifespan. For FM professionals, BIM offers a treasure trove of data, simplifying maintenance, renovation planning, and safety compliance.

The combination of digital twins and BIM in FM signals a paradigm shift in managing built environments. Let’s delve into their advantages:

*Proactive maintenance and predictive analysis*

Traditional FM often waits for issues to arise before addressing them. Digital twins, combined with BIM's data, give FM teams a real-time facility overview. This continuous data flow allows for anomaly detection, potential failure prediction, and impact modeling of changes. A study found that facilities with digital twins saw a 30% reduction in unplanned downtimes. Furthermore, by leveraging the predictive insights offered by these digital models, FM teams could schedule maintenance tasks during off-peak hours, leading to a 20% increase in operational efficiency and a significant reduction in disruption.

*Maximising energy efficiency and sustainability*

Digital twins and BIM aren't just about operational efficiency; they champion sustainability. Digital twins offer real-time energy consumption insights, helping FM teams spot inefficiencies. For example, over-illumination during daylight can be detected and rectified. Integrating BIM provides a facility blueprint, enabling FM professionals to simulate energy scenarios. This data-driven approach ensures decisions are grounded in real-world conditions.

Additionally, insights from both tools can guide retrofitting and upgrades in older buildings, promoting energy efficiency. For instance, a digital twin might reveal that an old HVAC system is consuming disproportionately high energy. Using BIM, professionals can then explore alternative systems, model their performance, and make informed decisions about upgrades.

*Space optimisation and enhanced safety*

Digital twins and BIM offer new possibilities for space optimization and occupant safety. For example, while a room might have a capacity for 40 people, seat sensor data might show that the average occupancy rate is only 25 people. Such insights can lead to more efficient space allocation, ensuring that spaces are utilised to their full potential.

Emergencies, by their very nature, are unpredictable and can escalate rapidly. In such scenarios, every second is crucial. Digital twins, equipped with real-time data, can provide invaluable insights into the location and movement of occupants within a facility. Consider a fire emergency in a multi-story office building. With the data from a digital twin, emergency responders can instantly ascertain which floors or rooms have the highest occupancy, allowing them to prioritise evacuation efforts. This not only speeds up the evacuation process but also ensures that no one is left behind in potentially hazardous areas.

Conclusion

Digital twins and BIM in FM represent a monumental advancement in how we manage our built environments. They're not just passing tech trends but foundational shifts setting new FM standards. The future of FM lies not just in adopting these technologies but in leveraging their full potential for efficient, sustainable, and safe spaces.