

The State of the Digital Twin Industry 2022



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Abstract / Executive Summary

One thing is clear as a result of the 2022 survey conducted by The IT Community of the International Facility Management Association (IFMA): three-quarters of senior leadership sees value in Digital Twins, and the same majority believe that a single software vendor can provide a solution for these technology solutions.

Furthermore, those vendors should also note that (at this point), nearly 70% of respondents intend to maintain their Digital Twins in-house, with less than 20% planning to trust that to an outside consultant. It was also clear that there are strong opinions in the marketplace on the definition of a digital twin, but no single definition as of yet.

Introduction

Between May and June of 2022, participants were polled on the state of the Digital Twin adoption. Responses to the survey came from across the industry with roles such as Architecture and Engineering, but the largest segment of respondents were Facilities Management and Corporate Real Estate Professionals.

The survey, which will be repeated annually, set out to gauge the current state of electronic documentation and understanding of potential future states. Suggestions were received for additional, clarifying, questions to be added to next year's iteration of this digital twin poll.

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The Digital Twin Concept

A digital twin is a dynamic, digital replica of a physical building or asset based on design, construction, and operational data. This replica evolves in synchrony with the actual building, from initial concept and design to the as-built manifestation, and then even further throughout its maintenance and renovation cycles.

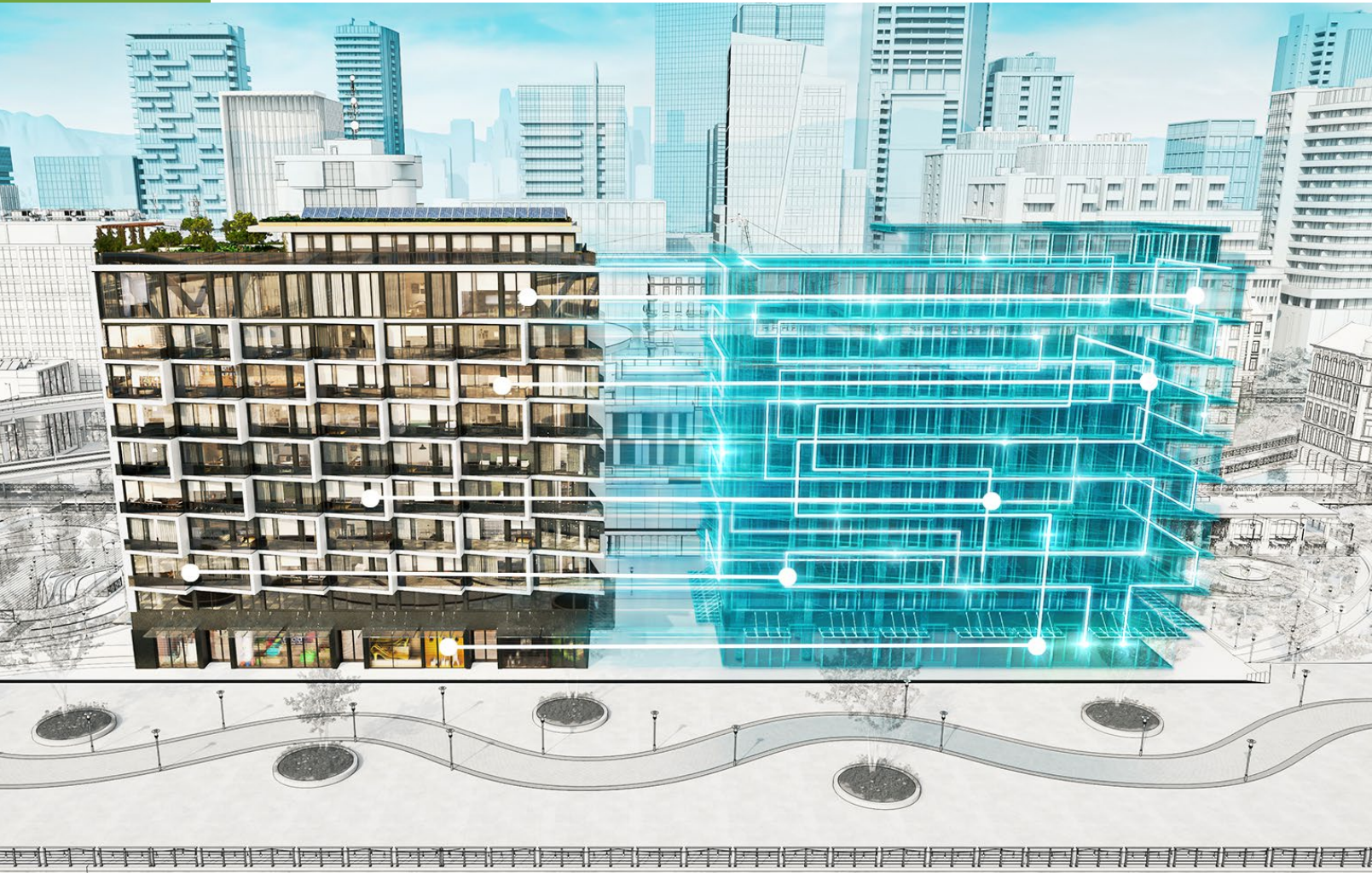


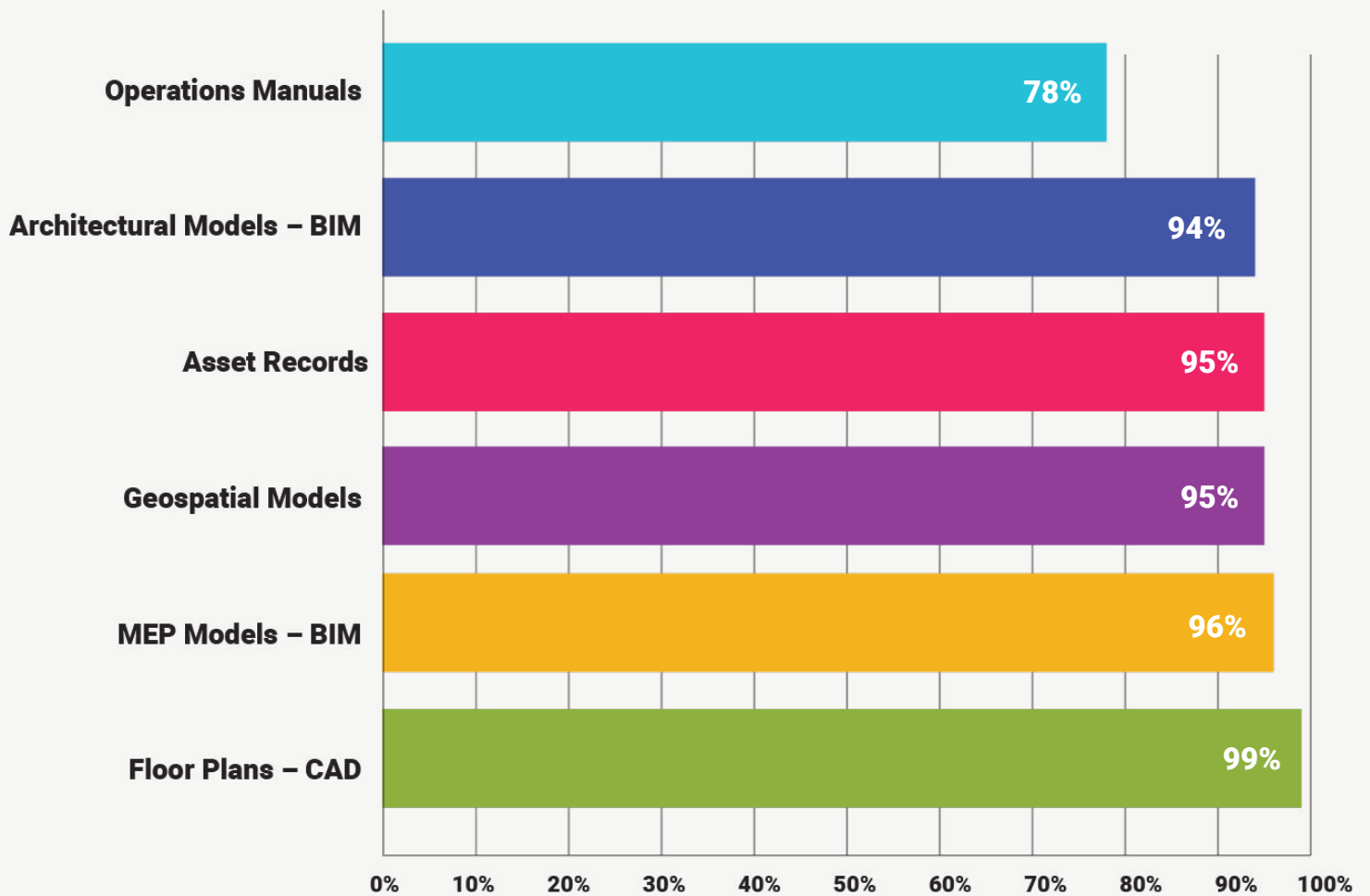
Image courtesy of Autodesk

One can think of digital twins as the ultimate form of building information management (BIM).

The shift toward digital design, electronic record keeping, cloud-based modeling, proliferation of sensors/ IoT devices, and other modern computer-based workflows has already set the stage for the creation of digital twins.

As shown in the results of the survey below, an overwhelming majority of architecture, engineering, and construction (AEC) along with facilities management data is already digital in some form.

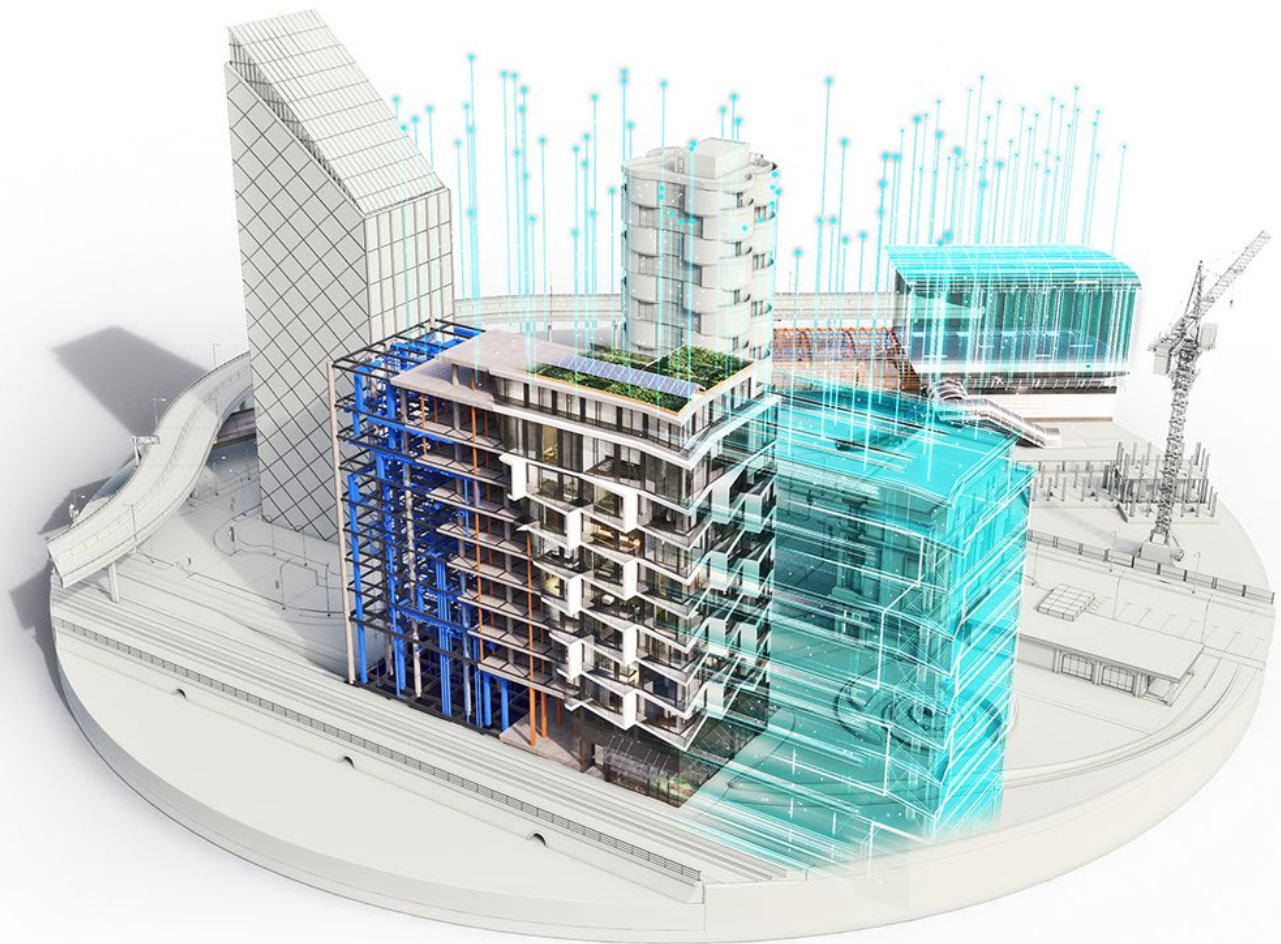
Majority of Data Available Electronically



With digital twins, the goal is to make this data available in a single platform along with any other data that might be useful in the construction, maintenance, and management of an asset.

This could even include real-time data from internet of things (IoT) sensors, active repair tickets, or scheduled preventive maintenance items.

Any member of a team with a vested interest in the success of a physical asset should be able to interact with the digital twin to be informed, make an assessment, and drive an actionable plan toward their goal.



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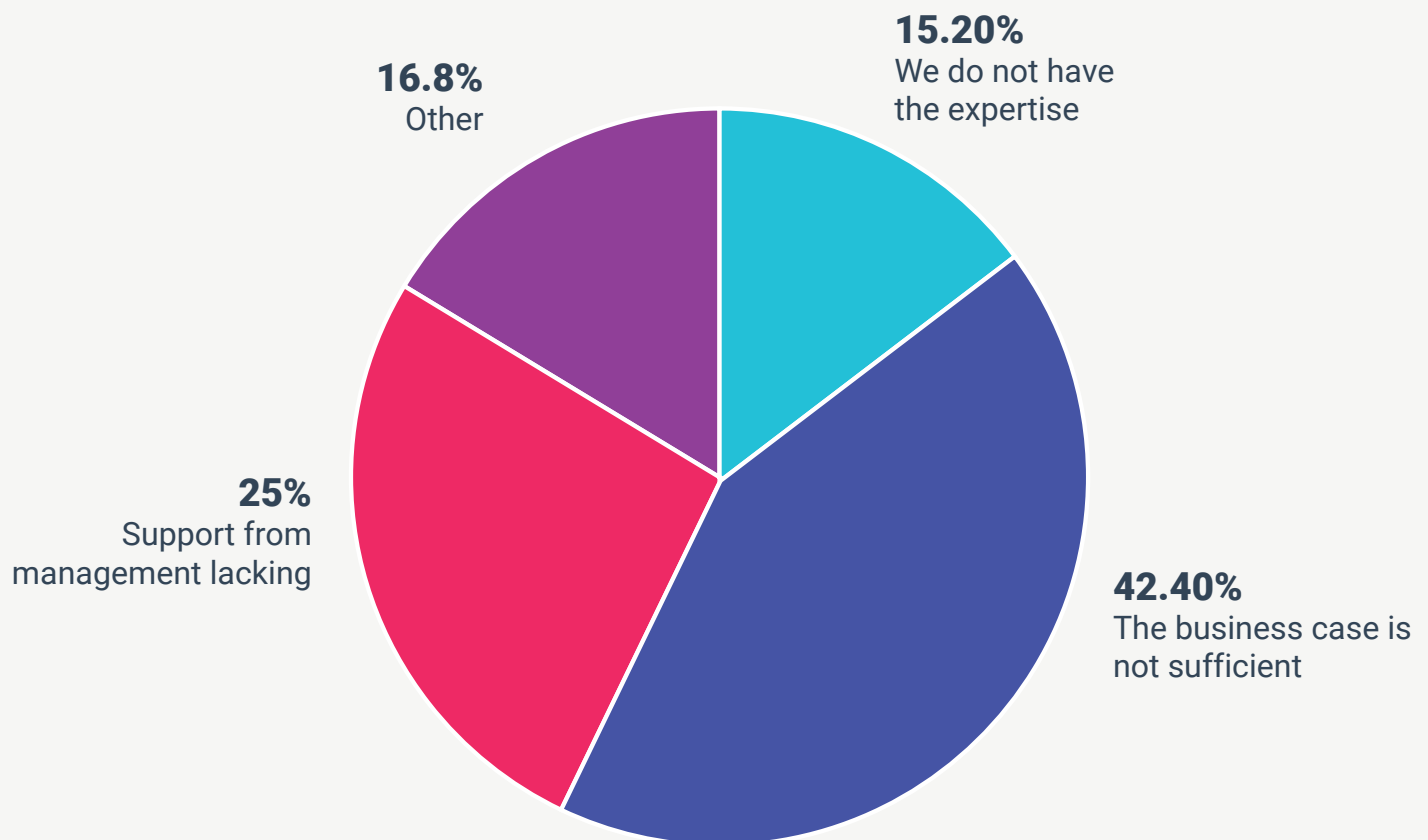
Digital Twin Adoption

While digitization of the many assets involved in the construction and management of a building has marched steadily forward, the unification of these assets into a sole source digital twin has been slow and challenging. The results of the survey shown below include a variety of reasons for this pace of adoption and point toward three main contributors: lack of a solid business case, minimal support from management, and a void of expertise in the field.

The first two contributors are clearly linked, as a solid business case would certainly garner support from management.

The third factor, lack of expertise, follows directly from this lack of support, and given a solid business case, would be quickly addressed by hiring the appropriate personnel with digital twin experience.

So, the primary question at hand is: what benefits does a true digital twin offer from both the AEC and the facilities management perspective?



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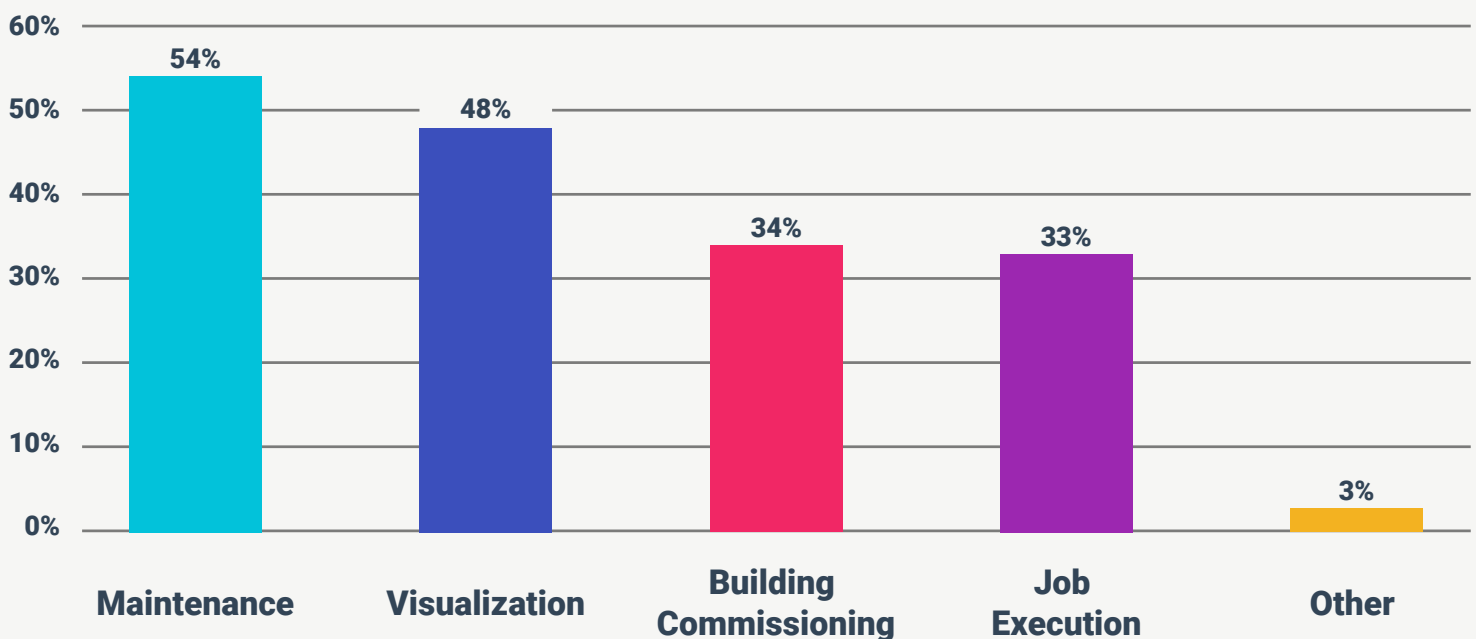
The Business Case for Digital Twins

The digital twin of a physical asset should be thought of as the sole source of truth common to the AEC team, the owner, and the facilities manager. Once this role is embraced, the value added by implementing digital twins becomes quite clear.

When asking high level managers and executives about the role of digital twins in their different jobs, it can be seen that regardless of specialty, the digital twin can be equally useful.

The results of this survey are shown below and demonstrate that the core utility of digital twins is roughly equally valued by facilities managers, designers, owners, and the like.

What are your dominant use-cases for construction digital twins?



Extending the Value of BIM

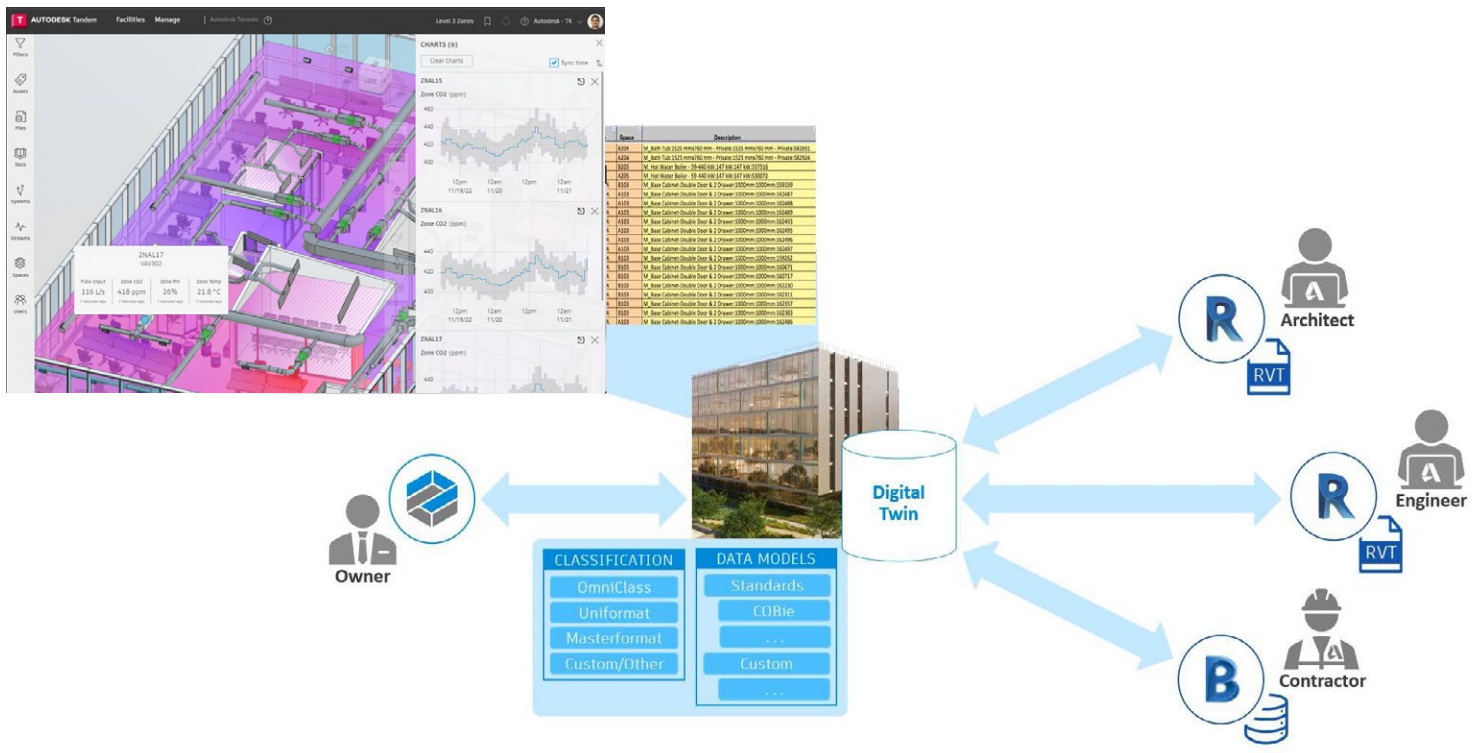


Image Courtesy of Autodesk and BNIM

From the AEC perspective, it is important to consider the continued industry shift toward “design, build, and operate” projects.

Gone are the days of throwing a project over the fence during a hand-off phase and hoping that any unresolved issues go with it.

AEC firms are now committed, more than ever, to facilitating a project's success through construction and beyond.

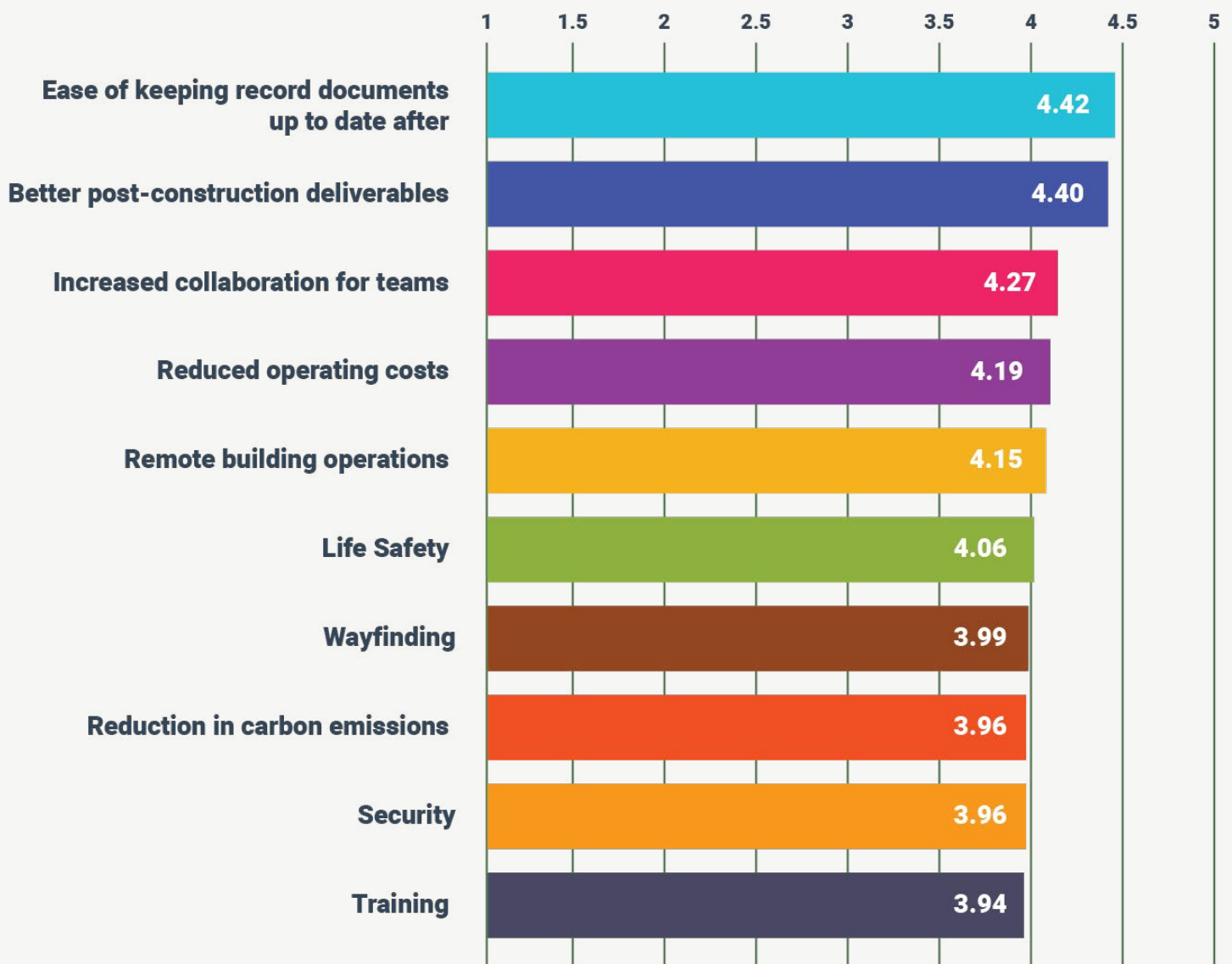
With digital twins, AEC firms can overcome traditional handover problems by centralizing all design data and eliminating the hassle-full and error-prone process of moving a project from one digital platform to another.

In addition, all of the stakeholders and different specialized teams can simultaneously collaborate during each and every phase of the project timeline. This improves efficiency, builds trust in the data due to early involvement of Owners, reduces rework costs, and allows for a more agile environment where the project can evolve dynamically to meet any changes in requirement or specification.

In addition, AEC firms can capitalize on digital twins by delivering them to clients as part of the completed work asset. The extra effort required to properly build the twin can be promoted as an additional, specialized service that adds significant value to future building operations.

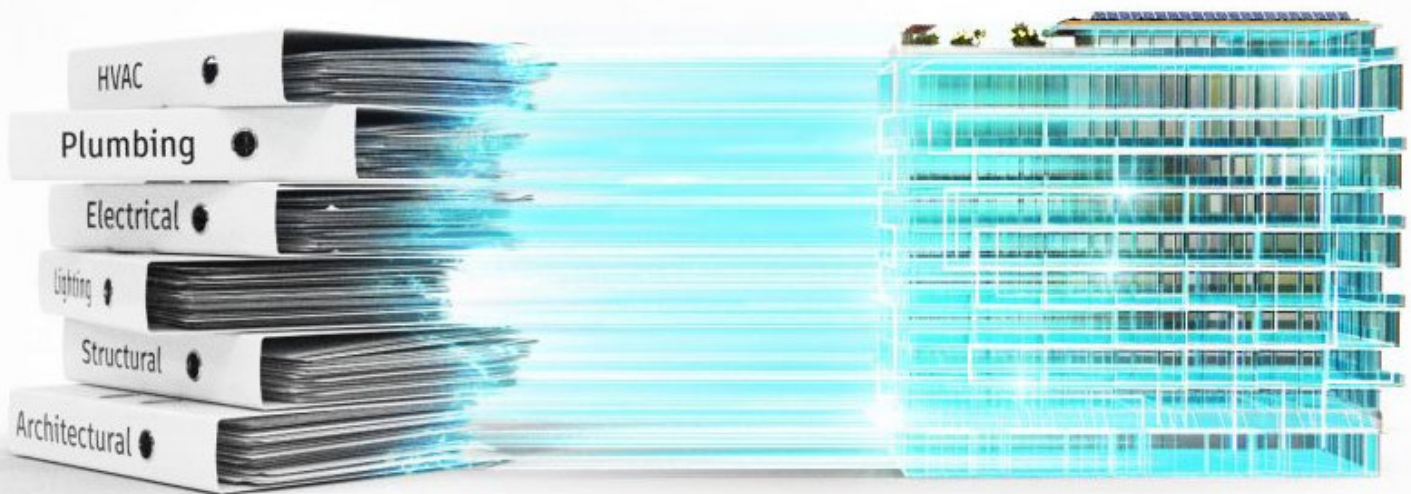
From the facilities management perspective, the business case for adopting digital twins is more straightforward. In large part, the value proposition comes from the increased efficiency of centralized record keeping coupled with the prospect of real-time and preventive maintenance based on sensor data. When surveyed on the operational advantages of digital twins, respondents identified many of these areas, as shown in the figure below.

What benefits do you expect Digital Twins to have in managing building operations and real estate portfolios?



The best business case for digital twins, however, can be made when the AEC firm creates a rich and accurate model and then hands it off to the owner and facilities team for further lifecycle management.

As with any operational framework, starting with quality data and then continuing with adherence to core principles and best practices will bear the most fruit over the life of the asset.



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Autodesk Tandem: A Digital Twin Solution

In order to truly embrace digital twins, a solid software platform and vendor is a necessity. Autodesk's digital twin solution, Tandem, allows any built asset to begin digital, stay digital, and deliver digital by weaving a common digital thread through the different phases of its lifecycle (i.e., design, build, and operate).

Leveraging industry-standard BIM data, Autodesk Tandem acts as a central arbiter of asset information for AEC firms, facility managers, and owners to turn fragmented data into business intelligence.

It is entirely cloud-based, offering its broad user base accessible, contextual, and insightful data from anywhere across numerous platforms.

This allows the various stakeholders of a built asset to stop managing individual files and documents, and instead focus on the process to specify, capture, and verify their tasks while simultaneously tracking every change.

To learn more, visit

intandem.autodesk.com

We hope you will participate in the 2023 Digital Twin Survey, for more information please visit it.ifma.org.

