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Demystifying Digital Twins

Lisa Neal
Skanska USA Building

Learning Objectives

1. Define digital twin (review industry definitions and examples)
2. Outline the process (issues and potential) for realizing an accurate and useful digital twin
3. Highlight the connection between digital twins, data, tools, stakeholders and additional touchpoints
4. Identify industry potential of digital twins over the next five to 10 years

Description

Did you know that 95 percent of construction data goes unused during building operations? Digital Twins may change the way owners interpret—and ultimately use—that data, but they have to know where to start. Digital Twin is an industry buzzword these days, and there is no shortage of companies who claim to be experts on these data-rich models. However, if the concept of a Digital Twin is going to survive its initial 15 minutes of fame, we must stop viewing Digital Twins as products and start seeing them for what they really are: intricately detailed processes. Every Digital Twin solution on the market looks and functions differently from the next. However, they all share a similar goal: to re-create a physical space in a dynamic, 3D environment. But the true appeal of a Digital Twin lies in the data. While most Digital Twin solutions have figured out how to integrate data and models, only a few have figured out how to present that data in an immersive, interactive and useful way.

Speaker(s)



Lisa is a CM-BIM certified Senior Emerging Technology specializing in BIM technologies and services. Since 2016, she has been primarily focused on upgrading project turnover. Lisa has been with Skanska for over seven years and has successfully delivered Enhanced Turnover Solutions to clients in Healthcare, Residential, K-12, and Higher Education. Lisa is a top-rated speaker at Autodesk University and has shared her experience at AU 2018, AU 2019 and AU 2020.

Definitions

Digital twin is not one size fits all.

dig·i·tal twin /'dijidl twin/ *verb*

- a **process** and tool to facilitate and unify data throughout the project life-cycle: design, estimating, construction, marketing, leasing, operations and divestment
- a **strategy** that links previous and future innovations together, including design visualization, immersive experiential marketing, BIM and VDC problem solving, real-time pricing, sustainability, and long-term efficiencies for building operations and maintenance
- a **collaboration** between industry leaders and innovators, including developers, architects, engineers, construction managers, big tech – cloud computing and gaming industries, subcontractors, and facility managers

The following are not the same as digital twin:

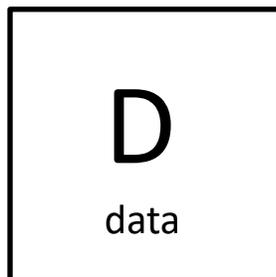
B·I·M /'bim/ *noun*

Building Information Modeling. The digital tool used by architects, engineers and Skanska VDC to design and construct the building; the foundational basis of the Digital Twin

smart build·ing /'smahrt bil-ding/ *noun*

A product or offering; a building management system that sends and receives information to and from the digital twin, in combination with IoT technologies, existing BMS software and predictive analytics to improve and enhance the customer and tenant experience, from building maintenance, to access controls, to sustainability performance

The Devil's in the Data



Data makes up our digital universe! It's as essential an element to the digital world as hydrogen, oxygen, nitrogen or carbon (the four most common and essential elements to life on earth) are to the physical world. A quality digital twin does not exist without quality data.

Current and Future State—Problems and Potential

There is currently no industry standard for digital twins. One can reference or pull influence from various adjacent standards until an industry standard is developed, but then the problem becomes that too many non-specific standards create inconsistencies that challenge standardization, growth and improvement.

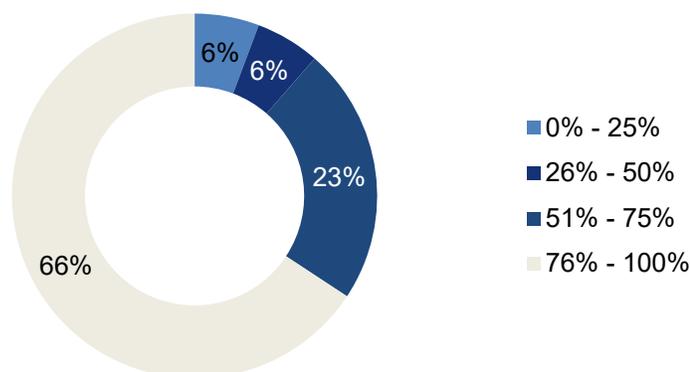
The UK, for example, follows government-mandated standards, but that is unlikely to occur in the US. How do we plan and prepare for this as the industry moves toward digital twins?

Some standards to get us started:

- **ISO 19650** Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Information management using building information modelling — Part 1: Concepts and principles
- **ISO 41001** Facility management — Management systems — Requirements with guidance for use
- **ISO 8000** Data quality — Part 1: Overview
- **ISO 56002** Innovation management — Innovation management system — Guidance

Additionally, we have a closeout problem. We're still waiting too long to start turnover, creating undue strain on resources and negatively impacting cost and productivity.

At what schedule % complete was closeout log created



The Future is Bright

We know there is long-term value in digital twins. Here are some examples:

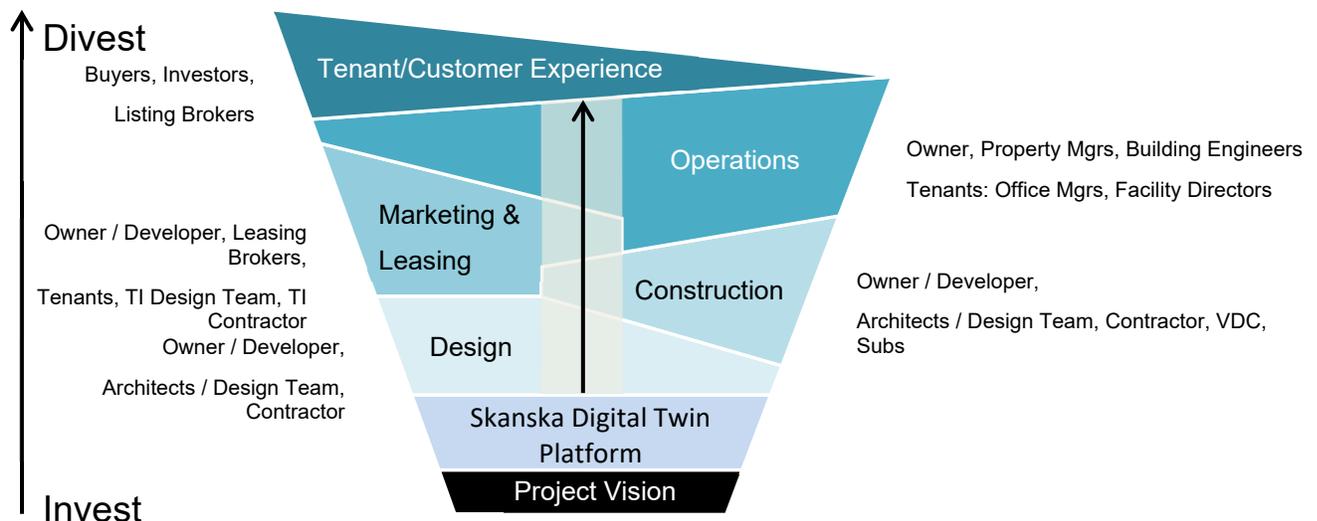
For Construction Managers

- Enables operational efficiency, improving profitability through the construction process
- Is a market differentiator and value-add service offering for external clients
- Addresses client needs for more sophisticated systems for operating their buildings
- Speeds up the closeout process, improving turnover deliverables and reduces time on site
- Creates standardization throughout the entire project lifecycle
- Increases accuracy of model-based estimates

For Commercial Development

- Streamlines the process of design through pricing and construction, increasing speed to market
- Allows project teams to evaluate opportunities of value-add and customer-focus through real-time pricing on project evolution,
- Benefits the marketing and leasing process with robust visualizations and precise TI specific information
- Is a market differentiator and a response to tenant expectations

Touchpoints



How to get Where You're Going

- **Plan** Identify or develop your asset and model standards. Design a path toward a digital twin deliverable that incorporates and enforces these standards.
- **Do** Choose a pilot project that has a reasonable timeline, appropriate scope and a project team that understands the value and supports digital twin.
- **Check** Establish regular gate checks for reviewing, organizing and correcting asset/attribute data and 3D models to ensure quality and accuracy.
- **Act** Make adjustments throughout planning and piloting. Update standards. Build in mistake-proofing measures. Record lessons learned. Launch!

Total Time to Deliver: 4-5 Years

Tips and Tricks

- Find common ground, standardize, and increase sharing, learning and collaboration
- Make a business out of digital twin; productize and standardize what has already been developed
- Connect skilled people from IT and other business units
- Learn from software and service providers
- Define what digital twin means to you and your company
- Garner support and investment from your leaders
- Evaluate scalability for digital twin solutions
- Look at synergies across the company to accelerate; be opportunistic