Digital Twins Transforming the Infrastructure Industry

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The world is different today than 5 years ago

**Unprecedented demand**
- Sustainability and resiliency
- Demographic shifts
- Stimulus packages

**Work has changed**
- Remote work
- Material supply chain
- Industrialization

**Accelerated Digitalization**
- Data and tool explosion
- Digital twins requested by owners
- Automation and Generative AI

**DIGITAL TRANSFORMATION**
Productivity has not changed in 50 years

Source: Office for National Statistics – Labour productivity and multi-factor productivity

Source: Office for National Statistics – Labour productivity
95.5% of data goes unused in engineering & construction \(^{(1)}\)

58% of owners said they’ve used or plan to use design-build \(^{(2)}\)

81% of owners want to drive better decisions from data \(^{(3)}\)
AEC Digital Transformations

Drafting

CAD

BIM 1.0
3D parametric modeling

BIM 2.0
cloud connected

40 YEARS OF TECHNOLOGY INNOVATION
BIM is the Backbone of Digital Transformation

Digital Twin is the outcome of the BIM process

DPD is how we deliver this experience today
Traditional process loses information and logic when shared between phases and personas.
BIM Today

Sequential, Fragmented & “Dead End”
BIM as we know it must evolve to meet industry needs

Increased project size and complexity generates an explosion of **data**

95% of all **data** goes unused in engineering & construction due to siloed collaboration

Lack of real time world context **data** to improve decision support

81% of owners and operators want to drive better decisions from **data**
The Future of BIM is Powered by Better, Connected Data
Better, Connected
Data is an Enabler

- Frictionless connectivity
- Effortless collaboration
- Secure access at anytime, from anywhere
- Real time and on demand insights
- Better, informed decisions
- Generative AI
- Reuse knowledge from prior projects
- Rich and vibrant 3rd party ecosystem of apps & services
AEC Projects are often a system of systems
Requirements for making digital twins an AEC industry reality

Source: ENR – Digital twins: An essential technology for infrastructure projects, 2022
Digital Twins: Disrupting the status quo in the infrastructure industry

- Moving from a project-by-project basis to integrated suites of tools and industry clouds
- Annuity revenues for AEC firms to manage and maintain digital twins for their clients
- Value-added digital services such as predictive maintenance

Redrafting the Business Model

- Helping infrastructure become more efficient, resilient, and sustainable
- Worker safety – moving field tasks into the office
- Supports retrofit and reconfiguration of infrastructure assets to achieve zero-carbon economies

ROI being Realized

- Full lifecycle single source of truth for all parties involved.
- Living visual and geometric representation of the physical asset
- Provides visibility into how assets are performing including past, present, and future indicators

A Real-Time System of Record

- Visualization unlocks the benefits of digital twins by communicating plans and ideas
- Enhancing the way capital projects are planned, built, and operated. Model for sustainability, then execute
- Integrated infrastructure assets allows for outcomes simulation - e.g., traffic prediction

Future Enabler

Source: CIO – Digital twins are primed to revolutionize the infrastructure industry, 2022, Forbes – Can digital twins change our world, 2022
Digital Twin Maturity

Source: Verdantix - Smart Innovators: Digital Twins For Buildings, June 2020
Spatial data is enabling the digital transformation

Accelerating Digital Twin creation for the full project lifecycle with BIM and GIS