

Building and Infrastructure Owners Hold the Keys to Connected Data

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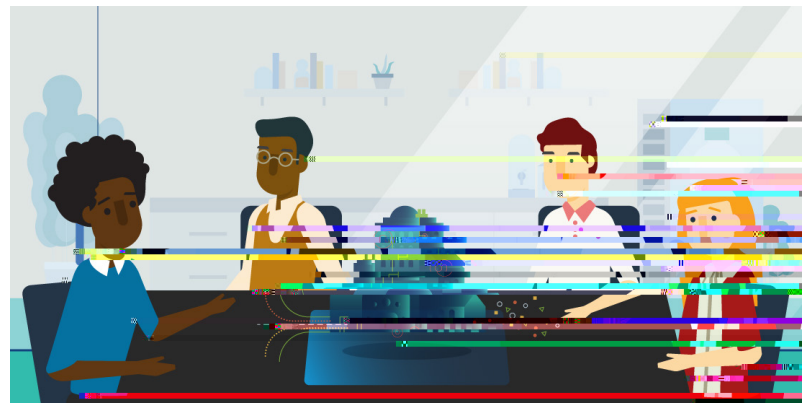
THE NEXT WAVE OF DIGITAL TRANSFORMATION IS CONNECTED DATA FOR OWNERS OF BUILDINGS AND INFRASTRUCTURE. INSIGHTS GATHERED FROM DATA CAN HELP BUILD RESILIENCY.

When the owners of Empire State, Inc. wanted to build a skyscraper, they asked the architects to revise the design 15 times to ensure it'd be the world's tallest. The ambitious project had an even more ambitious timeline, with owners requiring completion within 18 months—from start to finish. And on May 1, 1931, the Empire State Building's lights shone 1,454 feet above New York City, a feat of engineering made possible through collaboration among architects, engineers, contractors, and owners.

Fast-forward 90 years: Architecture, engineering, and construction (AEC) is a digital industry in which 15 revisions can happen in minutes. And owners are again playing a pivotal role in driving industry-wide transformation.

In the first major transformation, personal computers ushered in computer-assisted design (CAD). Next came BIM (Building Information Modeling), enabling cross-functional collaboration. Then, the industry moved to the cloud. Each transformation happened faster than the last, following the same trajectory: Innovators see a need for change, they ignite transformation, and the industry follows in waves.

Now, amid a global pandemic and a rapidly changing planet, AEC is ready for its fourth incarnation: a data-driven industry



powered by platforms, machine learning, and automation. The next generation of innovation is about gathering and analyzing data to design, build, and operate structures for a resilient future.

CATALYSTS FOR A FOURTH TRANSFORMATION

Natural disasters are increasing, and the global population is expected to reach 10 billion by 2050. Add a global pandemic, urbanization, labor shortages, diminishing resources, and vulnerable supply chains, and there's a perfect storm brewing.

The built environment is unprepared to handle what's to come. Right now:

- » Infrastructure is aging, and climate change is accelerating wear and tear.
- » Buildings produce 40% of the world's greenhouse-gas emissions.

- » Connected data support sustainability by helping owners make choices to reduce the carbon footprint of a built asset.
- » Platforms support granular data so owners can access subsets of information for greater agility and faster problem-solving.

2. Insights to Optimize Operations

Owners want more than static facts and figures. They want actionable insights to inform better decisions. Technology grants access to real-time, granular information to monitor data sets, such as how occupants and air circulation move throughout a building. At NASA's Ames Research Center, the 50,000-square-foot Sustainability Base facility's sensors monitor things such as room temperatures and landscape water usage, allowing an interactive approach to building lifecycle management.

3. Automation to Plan the Next Project

Data can also support automated environments. Machine learning and AI ingest existing information to simulate possible scenarios. Generative-design software creates thousands of options for monitoring and analyzing current assets, redesigning spaces, or planning the next project. At one Airbus manufacturing facility, an inefficient layout forced workers to walk long distances to fetch tools and materials. For greater workflow efficiency, Airbus digitally tracked human movement, using generative design to reconfigure the factory. By plugging in existing data and desired outcomes, the company created a better design that used more renewable materials, such as net-zero concrete.

The benefits of a data-powered future extend to every stakeholder in the AEC industry and include:

- » A common data environment with a cloud-based platform gives owners a snapshot of the asset for informed decisions and reduced lifecycle costs.
- » IoT-equipped buildings deliver real-time performance analytics so owners can manage individual elements to improve overall function and reduce operational costs.
- » Connected data—enabled through platforms—allow for greater automation to streamline processes, reduce errors and rework, and eliminate redundancies.



About the Author

Nicolas Mangon, vice president of AEC, Business Strategy and Marketing for Autodesk, is a leader of the global advancement of Building Information Modeling (BIM) across the architecture, engineering, and construction (AEC) industries. Mangon's mission is to lead the industry transformation to BIM and the cloud. Educated at the world-renowned Ecole Spéciale des Travaux Publics's Institution for Civil and Structural Engineering, Mangon brings deep industry expertise to the continued development of innovative solutions that address the AEC industry.

About the Article

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