

Digital Twinning in Practice: Insights, Potentials and Challenges

June 3, 2024 | Session Overview

Speaker

Dr. Issa Ramaji, Founder & CEO, dataArrows, and Associate Professor, Roger Williams University

Moderator

Jennifer Hitzke, Director, Governance & Special Programs, National Institute of Building Sciences

Digital Twinning in Practice Overview

Digital twins – detailed digital replicas of physical buildings – are recognized for enhancing design, management, and operational processes.

On June 3, 2024, NIBS hosted a webinar with subject matter expert and presenter Dr. Issa Ramaji, Associate Professor, Roger Williams University, and Founder & CEO of dataArrows.

Dr. Issa Ramaji presented the fundamentals of digital twin technology, its integration with building information modeling (BIM), and the creation of interactive, real-time building digital models. He highlighted the technology's role in optimizing various stages of a building's lifecycle, from planning to operation.

Attendees also learned about the application of digital twins in the building sector through case studies executed by his company, dataArrows. These examples demonstrated the technology's impact on occupant health, environmental

sustainability, and operational efficiency. The presentation also addressed challenges in adopting digital twins, including industry standardization, setup costs, data privacy, skill requirements, and the need for interdisciplinary collaboration.

Jennifer Hitzke, Director, Governance & Special Programs with NIBS, served as moderator for the webinar.

Digital Twins at Different Levels

According to Dr. Issa Ramaji, Associate Professor, Roger Williams University, and Founder & CEO of dataArrows, digital twins can happen at various levels within the built environment.

These include:

- Components
- Assets
- Processes

- Systems
- Network of systems

“We have a lot of technologies that can form pieces of this puzzle,” he said. “Digital twin is the art of integrating all of these pieces.”

Digital Twins and Asset Management

When it comes to asset management, 68 percent of building data is not digital, Dr. Ramaji said.

Further, 95.5 percent of all data goes unused in building projects.

In the built environment, there are differences between the reality and a digital twin. Reality includes the physics, behavior, condition, and environment. Here, digital twins might refer to the geometry model, simulations, RT data and analytics, and loads/restraints.

The use of digital twins comes with challenges, as it relates to the building industry. These include that each building is different and every building is used differently. Other challenges include data ownership privacy, training/financial justifications, and codes and regulations.

Building Innovation Webinar Series

As part of our mission to continue conference education, NIBS launched a [webinar series](#) to reach more professionals on new technology, trends, groundbreaking tools, best practices, and workforce solutions.

It’s our way of extending the Building Innovation annual conference beyond the in-person meeting.

The next webinar – [U.S. Design Guidance for CLT Floor Systems with Residential and Office Occupancy Loads](#) – takes place June 11. [Learn more about NIBS events.](#)