# Building Transformations

# The Future of Design and Construction: Insights from Collaborative Discussions on Digital Adoption

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# Executive Summary



*Pictured: Building Transformations event attendees on a guided site-walk experience.*

On October 16, 2025, *Building Transformations* hosted its Flagship Summit in Toronto, titled "**The Future of Design and Construction: Collaboration, Implementation, and Adoption**." The event brought together industry leaders, practitioners, and stakeholders to explore advancements in digital tools and processes. A key highlight was the end-of-day collaborative session—an interactive roundtable workshop where participants engaged in focused discussions on critical challenges in digital adoption.

**Tables were organized around three core themes:**

- **Data Interoperability & Standards**
- **Common Data Environment Fragmentation**
- **Digital Twin & Lifecycle Data**

This white paper synthesizes the insights from these discussions, drawing directly from participant summaries. It highlights what's working, persistent barriers, and actionable recommendations to propel the architecture, engineering, and construction (AEC) industry forward. Key takeaways include the need for open standards to enable seamless data exchange, strategies for maintaining a single source of truth with flexibility, and owner-driven processes to

ensure data flows effectively from design through operations—alongside emerging opportunities with AI.

By addressing these themes, the industry can foster greater collaboration, reduce fragmentation, and unlock the full potential of digital technologies for lifecycle management.

# Introduction

The AEC industry stands at a pivotal moment, where digital transformation promises enhanced efficiency, reduced costs, and improved sustainability. However, challenges in data interoperability, environment fragmentation, and lifecycle integration continue to hinder progress. The October 16, 2025, Summit in Toronto—hosted by Building Transformations—provided a platform for open dialogue, culminating in a collaborative session.

This session adopted a workshop-style format, with participants breaking into tables to discuss predefined questions. After approximately 20 minutes of deliberation, representatives from each table shared summaries of their ideas, challenges, and outcomes. The discussions were informed by real-world experiences from diverse stakeholders, including owners, engineers, architects, and technology experts.

The following sections detail the insights from each thematic area, grouped by topic for clarity.

# Data Interoperability & Standards

## Question: Adoption of Open Standards like IFC and BCF—What's Working, What's Not?

Discussions on data interoperability underscored the value of open standards in enabling cross-platform collaboration while revealing ongoing implementation hurdles.

### What's Working:

- Universal formats like IFC promote collaboration across disciplines (e.g., architecture, structural, and MEP engineering), allowing seamless data traversal that was impossible two decades ago.
- Open standards reduce reliance on proprietary formats (e.g., DWG or Revit files), providing confidence for municipalities, governments, and agencies in data exchange.
- BCF enhances collaboration by enabling viewpoint sharing between tools like Revit and Navisworks, creating efficiencies and workarounds for interdisciplinary teams.

## What's Not Working:

- Importing IFC files into tools like Revit can be time-consuming, especially for large models, leading to suggestions for compartmentalization (e.g., by phase or discipline) to improve efficiency.
- Repeated realignment of models upon import/export disrupts workflows.
- Limited experience with BCF files results in challenges like the inability to import multiple files simultaneously, similar to issues in Navisworks where new imports override existing ones.
- General industry confusion persists around terms like IFC, with inadequate training in managing large datasets contributing to misunderstandings.
- Clients often receive more data than needed or usable, highlighting a gap between project deliverables and operational requirements.

## Recommendations

- Invest in training and upskilling to build competency in open-standard workflows.
- Explore modular modeling strategies to make exchanges more manageable.
- Leverage AI to structure data inputs, ensuring outputs are "as good as the data feeding it," while addressing structured vs. non-structured debates.
- Push for clearer client requirements upfront to ensure produced data is fit-for-purpose.

# Common Data Environment Fragmentation

## Question: How Can We Create a Single Source of Truth Without Sacrificing Flexibility?

Participants explored strategies for unifying data environments (CDEs) while maintaining adaptability, emphasizing structure, culture, and technology.

## Key Insights:

- Data structuring is foundational for exchange; proprietary software creates barriers, necessitating open BIM approaches and interoperable tools to enable fundamental data interoperability.
- Hesitancy in data sharing stems from concerns over what information must be exchanged and why, requiring encouragement for industry-wide accessibility.
- Integrations via APIs allow data silos to communicate, fostering a culture of collaboration and transparency.

- Standardized data formats (e.g., MasterFormat for scheduling, proper BIM standards) ensure usability, with examples like consistent folder structures in platforms such as Autodesk Construction Cloud (ACC).
- Data visibility and accessibility are crucial, but overwhelming volumes call for role-based views to filter relevant information without exposing everything.
- Cybersecurity risks arise from centralized data; flexibility may require restricting access to sensitive elements.

## AI Impact:

- Negatively, AI can generate excessive or irrelevant data, creating "noise."
- Positively, it can reorganize existing data into structured formats, enhancing the single source of truth over time.

## Recommendations:

- Establish open exchange systems at the tool level to address proprietary challenges.
- Promote standardized processes from project setup, including clear information needs and sharing protocols.
- Balance centralization with security through granular access controls and AI-assisted data management.



*Pictured: Limberlost Place - Toronto, Ontario, Canada*

# Digital Twin & Lifecycle Data

## Question: How Do We Ensure That Design and Construction Data Flows into Operations Effectively?

This theme focused on bridging design/construction with operations, viewing digital twins through the lenses of tools, processes, and people.

## Key Insights:

- **Tools:** Deploy effective CDEs that integrate with Computerized Maintenance Management Systems (CMMS). Use interoperable, flexible formats (open source or standardized) for data transfer. Incorporate sensors (e.g., in concrete pours) for real-time data capture.
- **Processes:** Integrate operational requirements early via top-down mandates. Design BIM requirements for asset integration, including appropriate Levels of Development (LOD), parameter standardization, and information containers. Offload BIM by incorporating external sources like spreadsheets or schedules. Follow standards like ISO 19650 for outlining Exchange Information Requirements (EIR) and federated models.
- **People:** Engage Facilities Management (FM) operators early to understand CMMS needs. Create responsibility matrices for information sources. Owner-driven requirements are essential, including standardized digital twin applications, vendor adoption, and backend training/manuals.
- Data centralization at the design stage, with QA/QC, ensures quality. Contracts should align incentives across owners, builders, and engineers, enforcing BIM uses through ongoing verification.
- Technology for automated data validation can help ensure deliverables match requirements.

## AI Impact:

- AI serves as a user-friendly interface for structured data, aiding in manual development, QA/QC, and data identification in spreadsheets.
- Poorly structured data leads to "messy" outcomes; proper setup is critical.

## Recommendations:

- Owners must lead by developing clear, enforceable requirements and representing BIM interests throughout the project.
- Foster cross-team communication to handle changes and maintain data integrity.
- Develop domain-specific guidance (e.g., for infrastructure like bridges) to support lifecycle data needs.

*Pictured: Participants from the collaboration session having open dialog and discussing proposed challenges.*

# Conclusion

The collaborative session at Building Transformations' October 2025 Flagship Summit illuminated clear pathways for advancing digital adoption across the AEC industry. By embracing open standards, unifying data environments while preserving necessary flexibility, and ensuring seamless flows of information from design and construction into operations, stakeholders can overcome persistent fragmentation and silos.

Building Transformations remains committed to convening the industry, facilitating these critical conversations, and supporting practical, practitioner-led progress toward a more connected and lifecycle-focused sector. Our role in driving collaboration, education, and alignment across Canada provides a neutral platform to harmonize diverse efforts and accelerate meaningful change.

Moving forward, industry leaders should prioritize owner-driven initiatives, invest in training and upskilling, and leverage AI judiciously—always with high-quality, structured data as the foundation. These steps will not only address today's challenges but also position the architecture, engineering, and construction sector for innovative, efficient, and sustainable growth in the years ahead.