The Future of BIM

Presentation at ASHRAE IL

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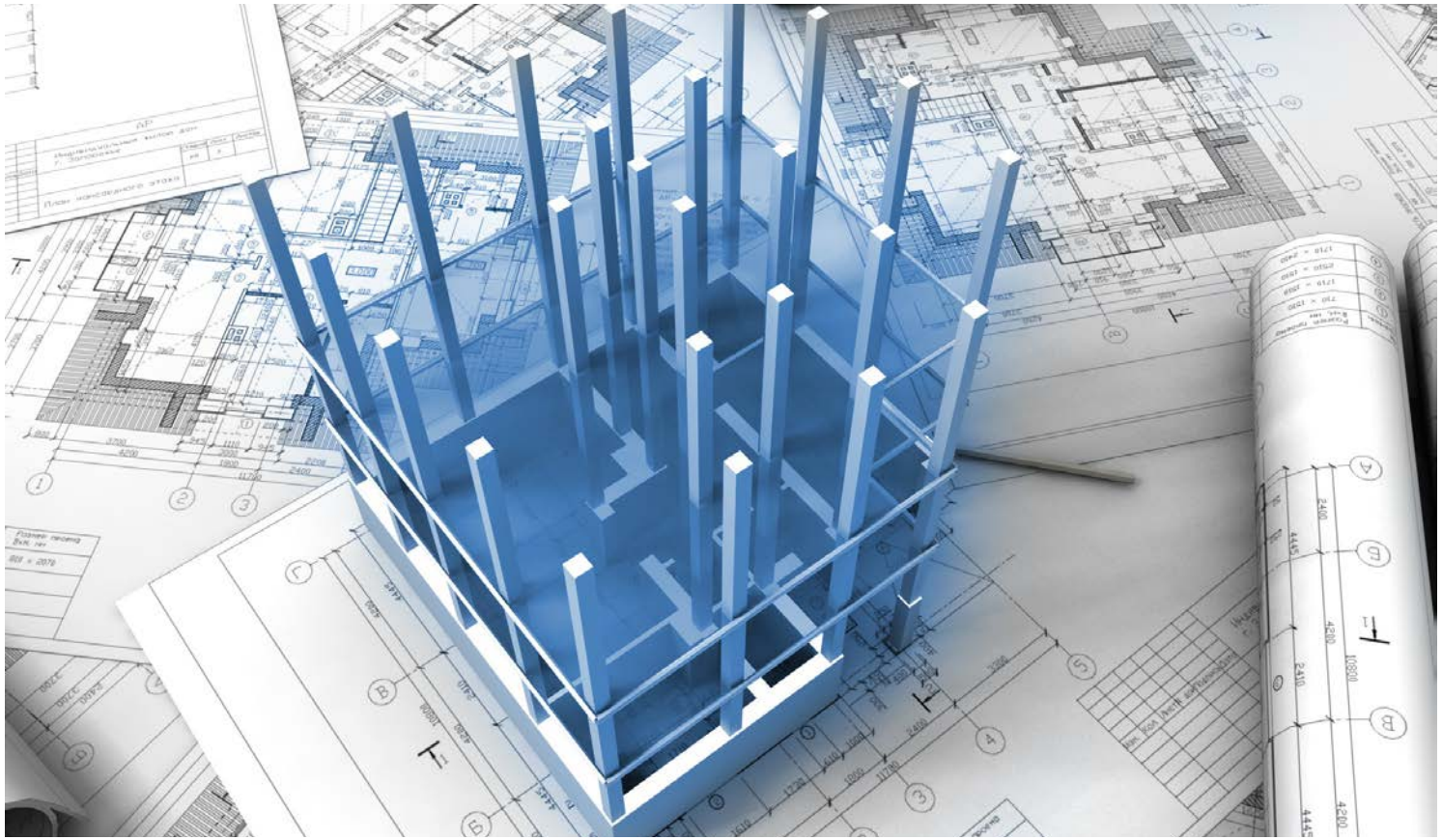
My Background

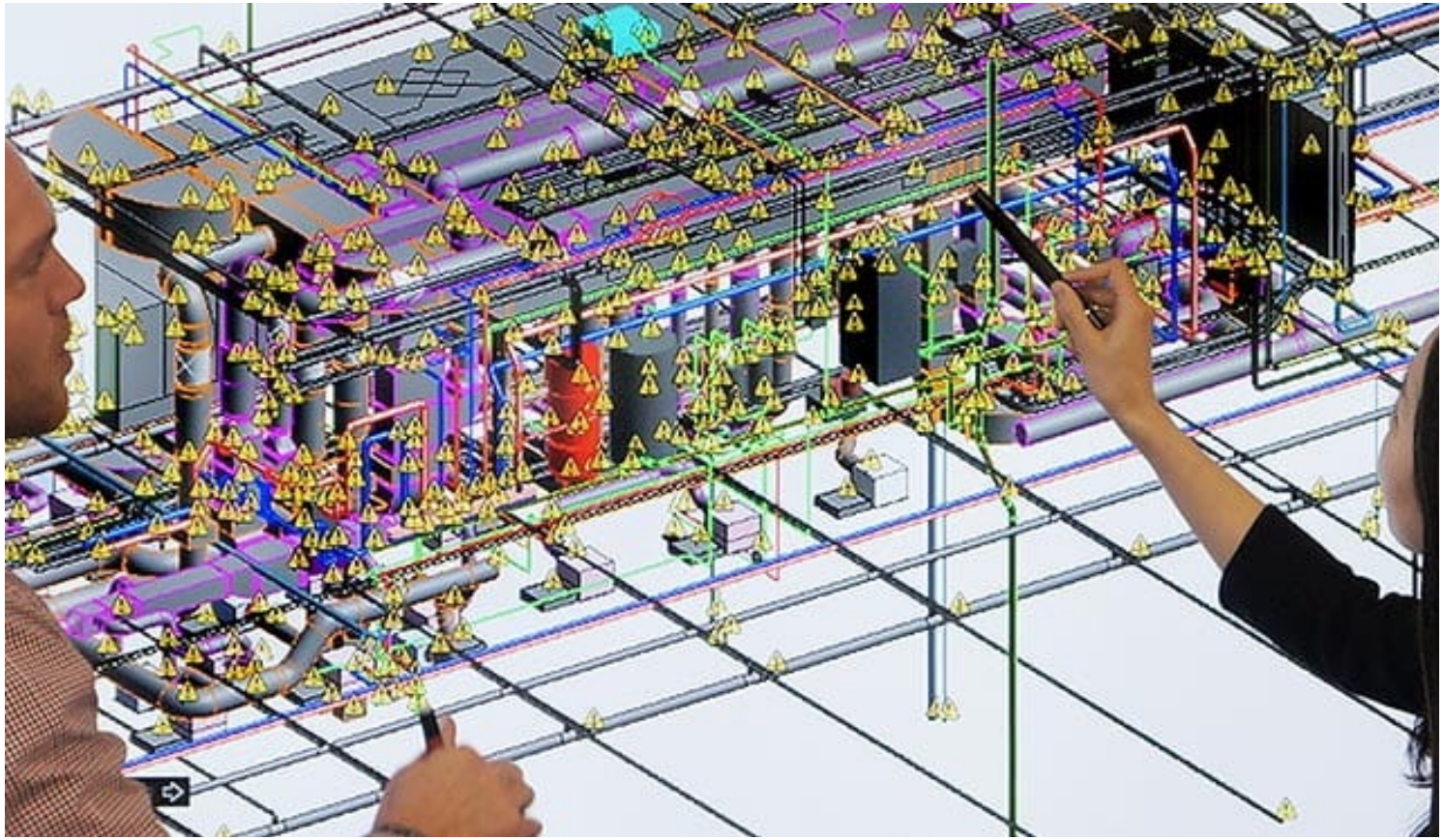
- Founder, The_Link
- GM, Crosswalk at Construction Specifications Institute
- Consultant, *eVolveMEP*
- Host, *Constructed Futures Podcast*
- Author, *The Construction Technology Handbook*
- 12+ years construction technology
- 28 years building & marketing technology



What is BIM?

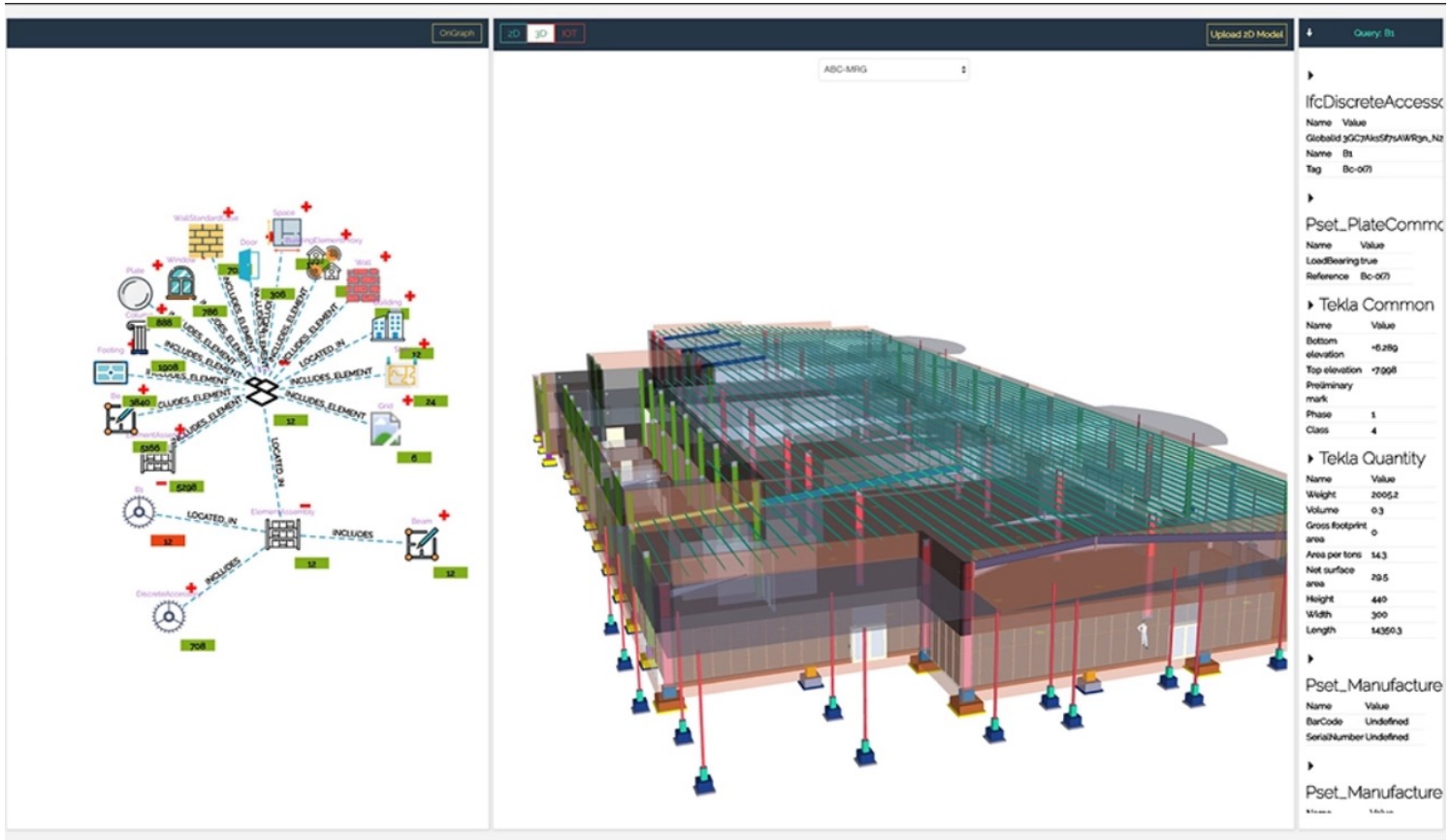
Building *Information* Model

a range of things, from a spreadsheet of the information about a building to a Revit file to an advanced Digital Twin of a building



What is BIM For?

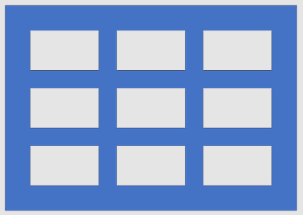
1. Designing a Building
2. Designing the construction of a building (e.g., Coordination)
3. Quantity Takeoffs
4. Modeling Building Performance
5. Managing Buildings (e.g., Digital Twins)



From Static Images to *Data*, Everything Changes

1. We can evaluate designs much faster
2. We can automate designs for construction
3. We can analyze quantities
4. We can evaluate many different designs for building performance
5. We can use models to manage buildings

Where is BIM Going?

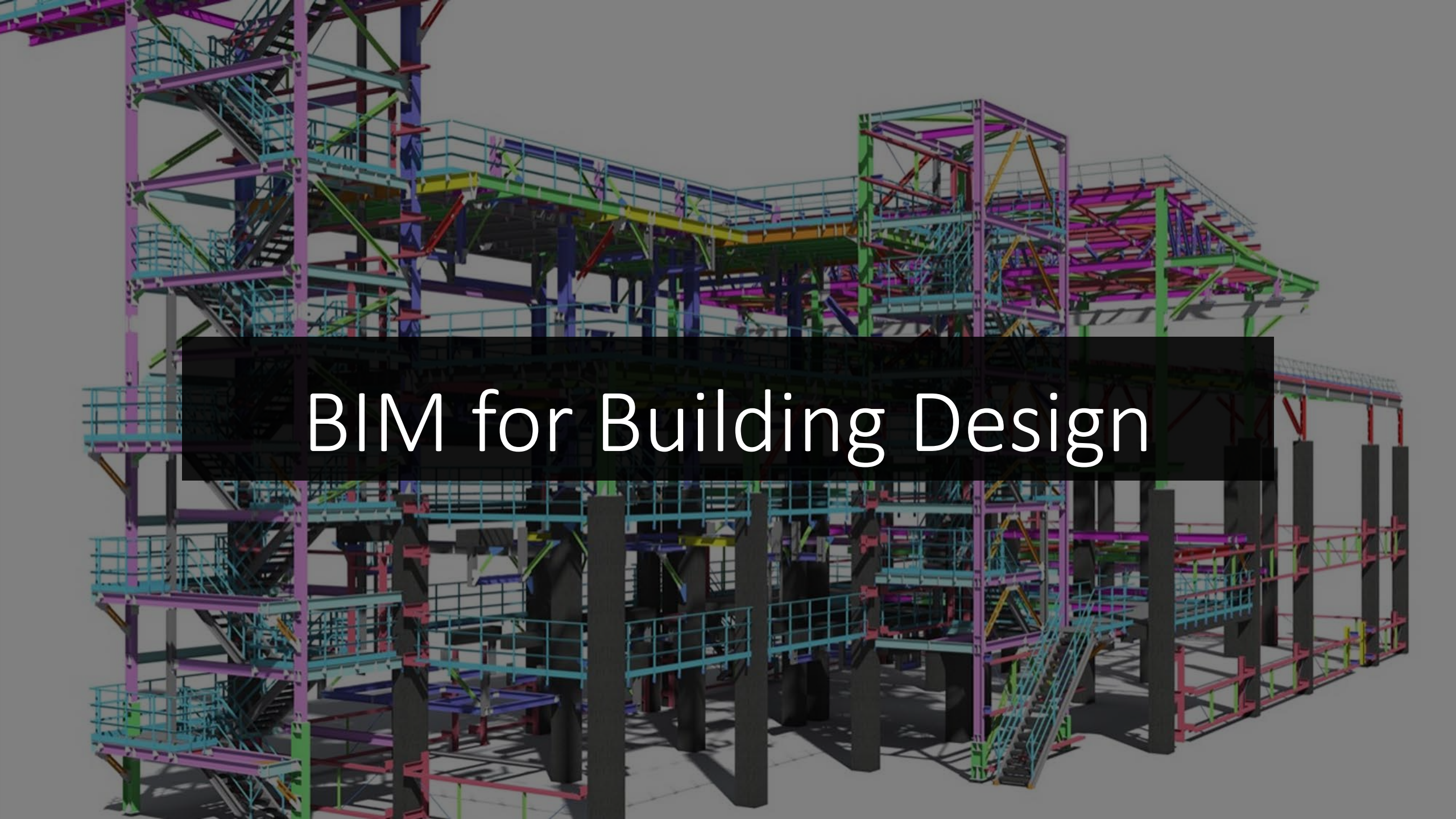


DATA

Software Integrates BIM to Workflows via **Data**

- **Autodesk Forge** has 1,000+ plugins
- **Procore** connects BIM to site workflows
- **eVolveMEP** automates detailing and other workflows
- **Msuite** connects BIM to Fab
- **GTP Stratus** connects BIM to Fab
- **Collectus** provides access to standards & 36k+ pre-built models

and many more...



BIM for Building Design

Developing Technologies

- **Truly Parametric Design:**
  - Assembly of pre-designed components based on their strength, heat conductance, etc.
- **AI Augmented Design:**
  - Also based on parameters, AI generates 100’s of ideas for human designers to start with
- **Collaborative Design:**
  - Owner/Architect/Contractor involved early & often

New Workflows

- Many more ways to solve the problem
- Circular workflows incorporate different inputs
- Test ideas in simulations vs. relying only on standards tables
- More sophisticated solutions

Implications for Trades

- More input early on, especially MEP trades
- Potentially higher level of difficulty
- Constructibility continues to be a challenge

BIM For Designing The Construction Process

New Technologies

- Automated detailing
  - Faster, more accurate
  - Less time on repetitive work
- Integrating Field, Fabrication & Scheduling
  - Build it in field vs. build it in Fab
  - Capacity, quantities & workforce management
- Faster Responses to Upstream Changes
  - Everything tied into a model vs. siloed

New Workflows

- Simulation of Fab/Field Mix
- Downstream upgrade of scheduling
- Better data in one place drives better data in others – tightening overall efficiency

Implications for Trades

- Learn to manage increasingly tight tolerances
  - Design requires constructability knowledge earlier
- Learn to leverage benefits of data vs. just the costs
  - More tools to think, to test, to simulate – think about the business not just think in the business
- Ultimately, better, more profitable jobs

BIM For Quantity Takeoffs

New Technologies

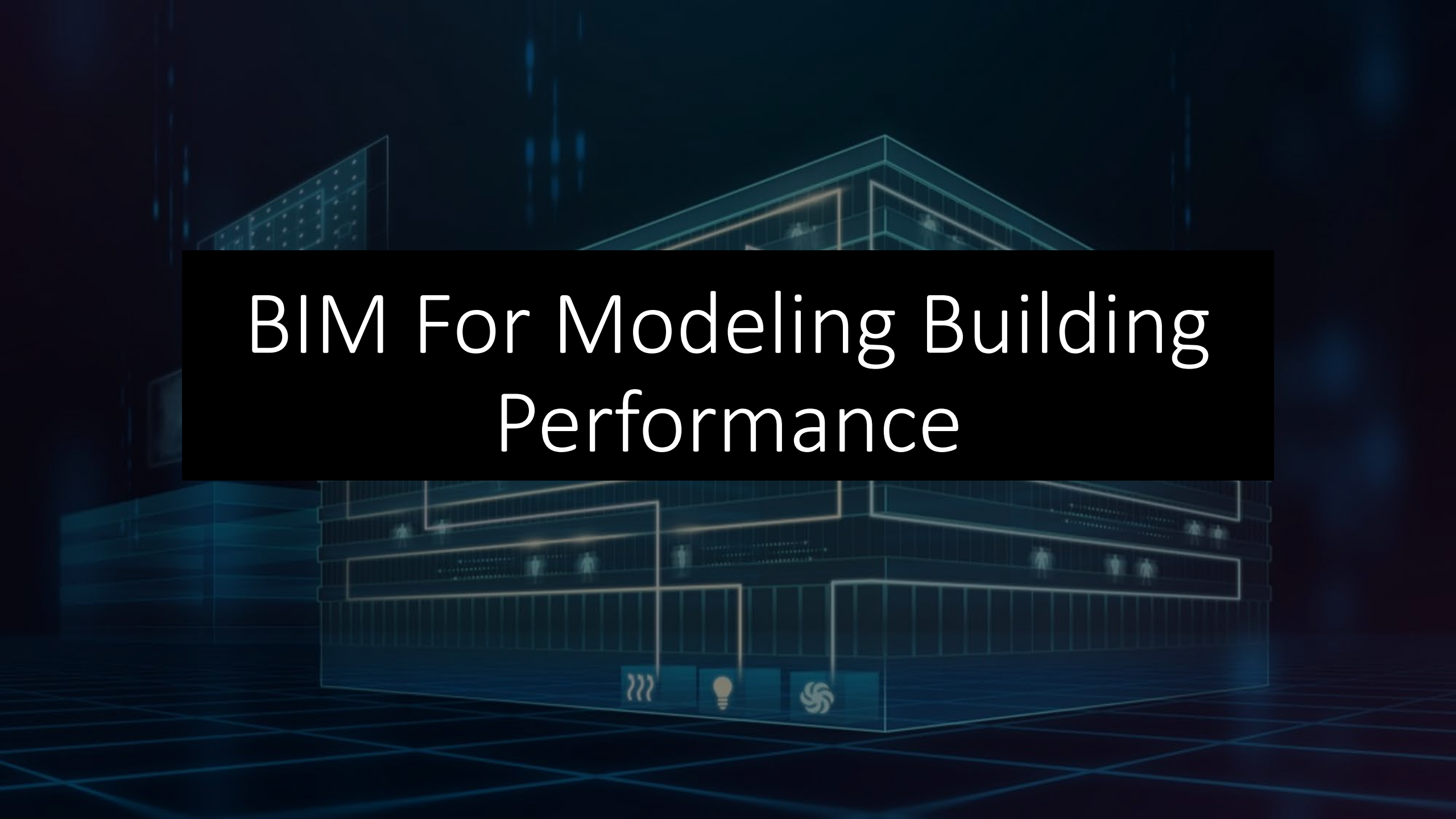
- Direct from BIM takeoffs
- BIM vs. BOM quantity analysis

New Workflows

- Buyout analysis
- Product Rationalization
- Integration with Distributor Inventory Management

Implications for Trades

- Less time on manual work
- Easier inventory management
- Continued balance between field autonomy and organizational efficiency



BIM For Modeling Building Performance

New Technologies

- BIM as Simulator
- BIM objects parameter driven
- Environmental Standards you can use

New Workflows

- Simulating performance in Design, Pre-construction
- Change Orders include simulation as part of approval
- Live, “operating” digital twin that contractors can access

Implications for Trades

- Performance was always important
- Simulation makes questions easier to answer, by more people
- Simulation makes questions easier to ask, by more people

BIM For Managing Buildings

New Technologies

- Digital Twins for Operators
- Internet of Things embedded in HVAC/building systems
- Internet of Things as Sensor network

New Workflows

- Service contracts expand for some contractors
- Active management of building systems
- Mechanical equivalent of “low voltage” business

Implications for Trades

- Opportunity to consult as buildings convert systems
- New inputs on performance feed back into design decisions
- Maintenance more important input

Key Takeaways

- BIM isn’t just models, it’s data about the building
- Data is becoming more integrated, more useful
- Simulation is a new management muscle
- Simulation can be counter to industry culture of practicality and action
  - It was the same for manufacturing, shipping & supply chain
  - Overcoming this led to enormous gains in efficiency

Last Point

Thinking About Data

- Not a “Bad word”
- Does not have to mean statistics/dashboards
- Think of data as information that:
  - Is easy to share, transmit, connect to other systems
  - Is easy to transform from one format or use case to another
  - Is easier to standardize, even from rough inputs
  - Aids management of complexity

Thank You