
BUILDING INFORMATION MODELLING (BIM)

***- TECHNOLOGISTS & SURVEYORS -
A CONVERSATION***



FIG WW 2019, Hanoi 21 April 2019

By Dr. See Lian Ong

Introduction

GLOBAL CONSTRUCTION VOLUME:

2010 **US\$7.2 trillion**

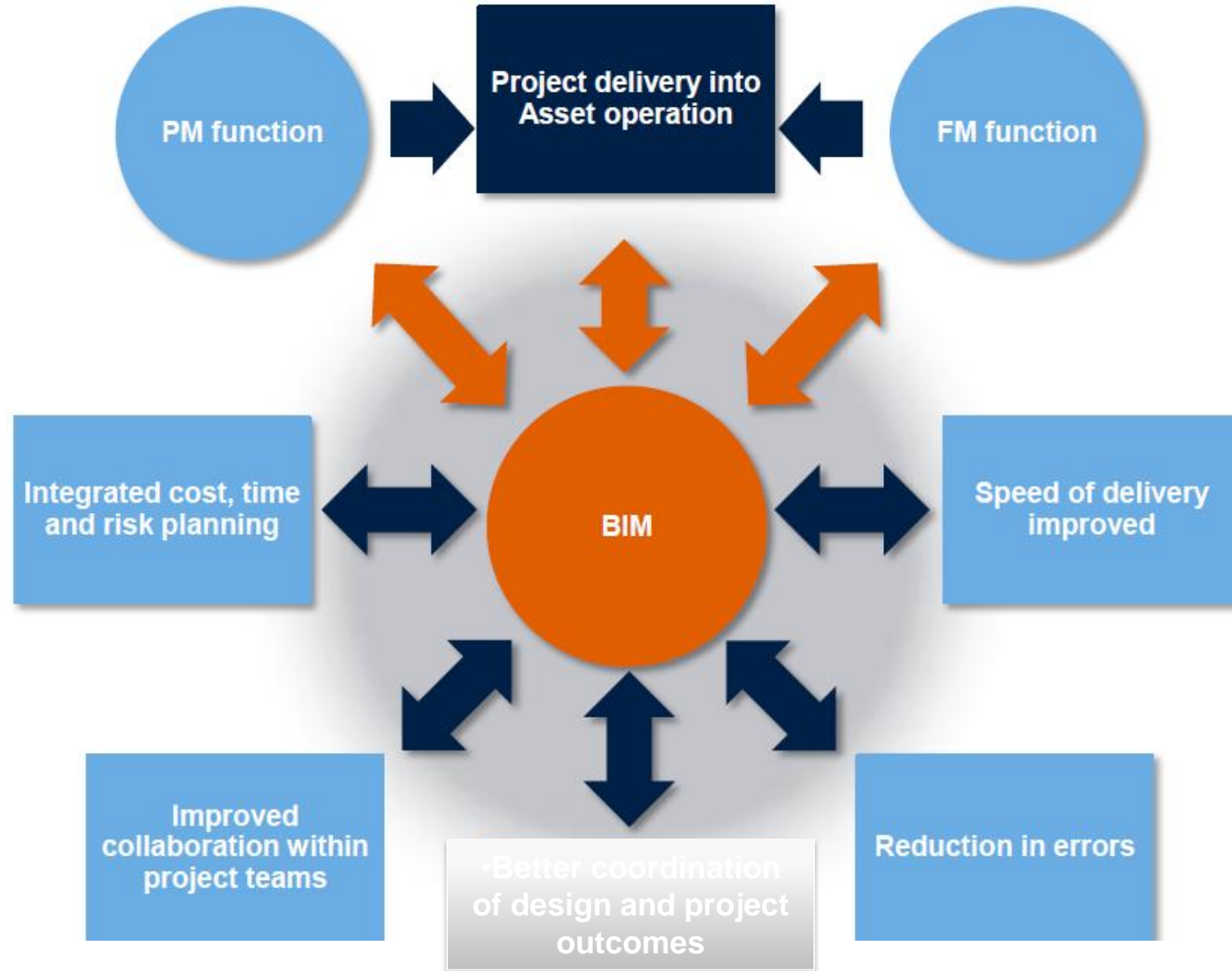
2020 **US\$12 trillion**

2025 **US\$15 trillion**

Introduction

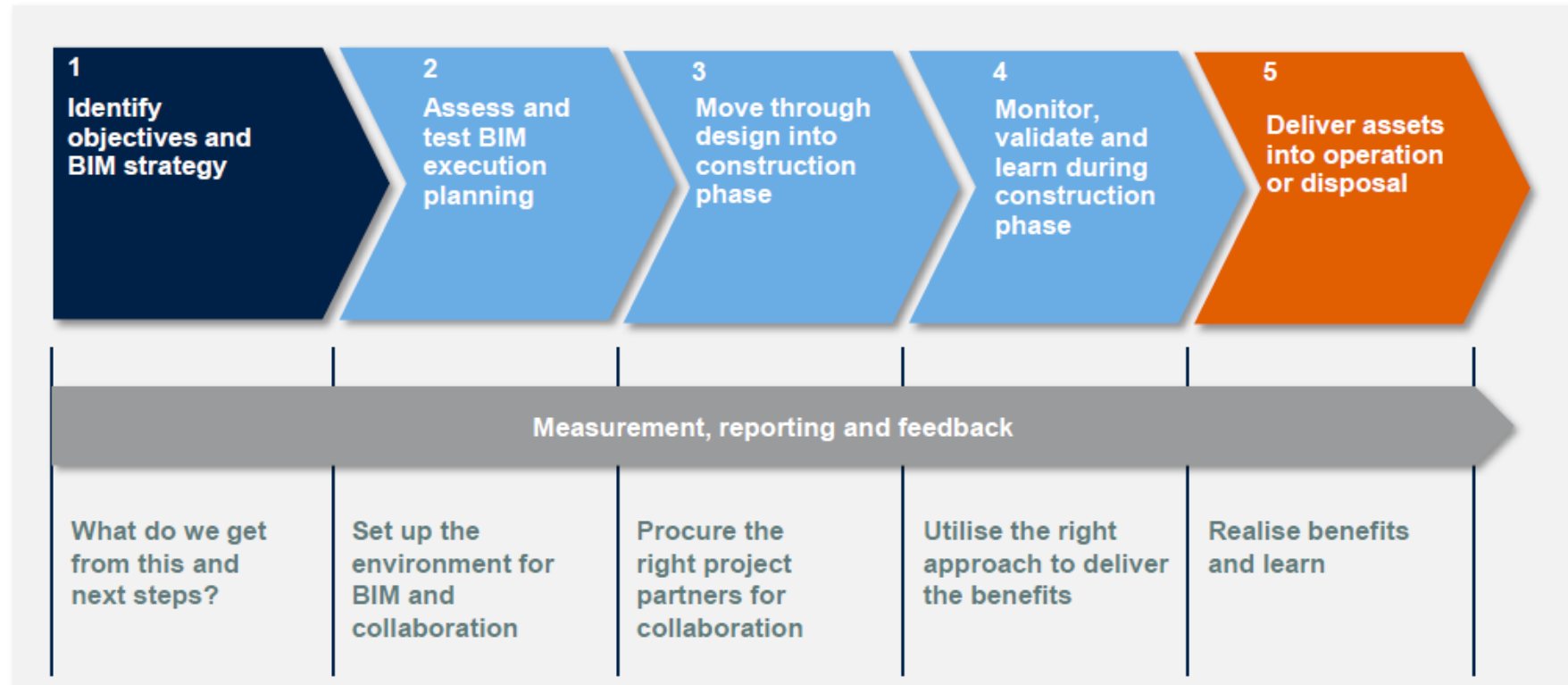
- **According to the World Economic Forum, within 10 years, full-scale digitization could lead to savings between \$0.7-1.2 trillion (13- 21%) in the Design & Engineering and Construction phases.**
- **Unfortunately, Construction Industry is very cyclical and fragmented and the industry is risk-averse.**
- **In many ways, this fragmentation has existed in the abundance of technology solutions offered to construction professionals for the past few years.**

Application of BIM – Push and Pull?



How?

■ BIM Service Map



Current Conversations on the use of BIM among Surveyors

- 
- 1. BIM Adoption**
 - 2. Climate Concerns Are Driving Energy Efficient Tech**
 - 3. Materials Matter in the Future of Construction**
 - 4. Collaboration, Interoperability and Integration**
 - 5. Technology is Driving the New Construction Workforce**

1. BIM Adoption

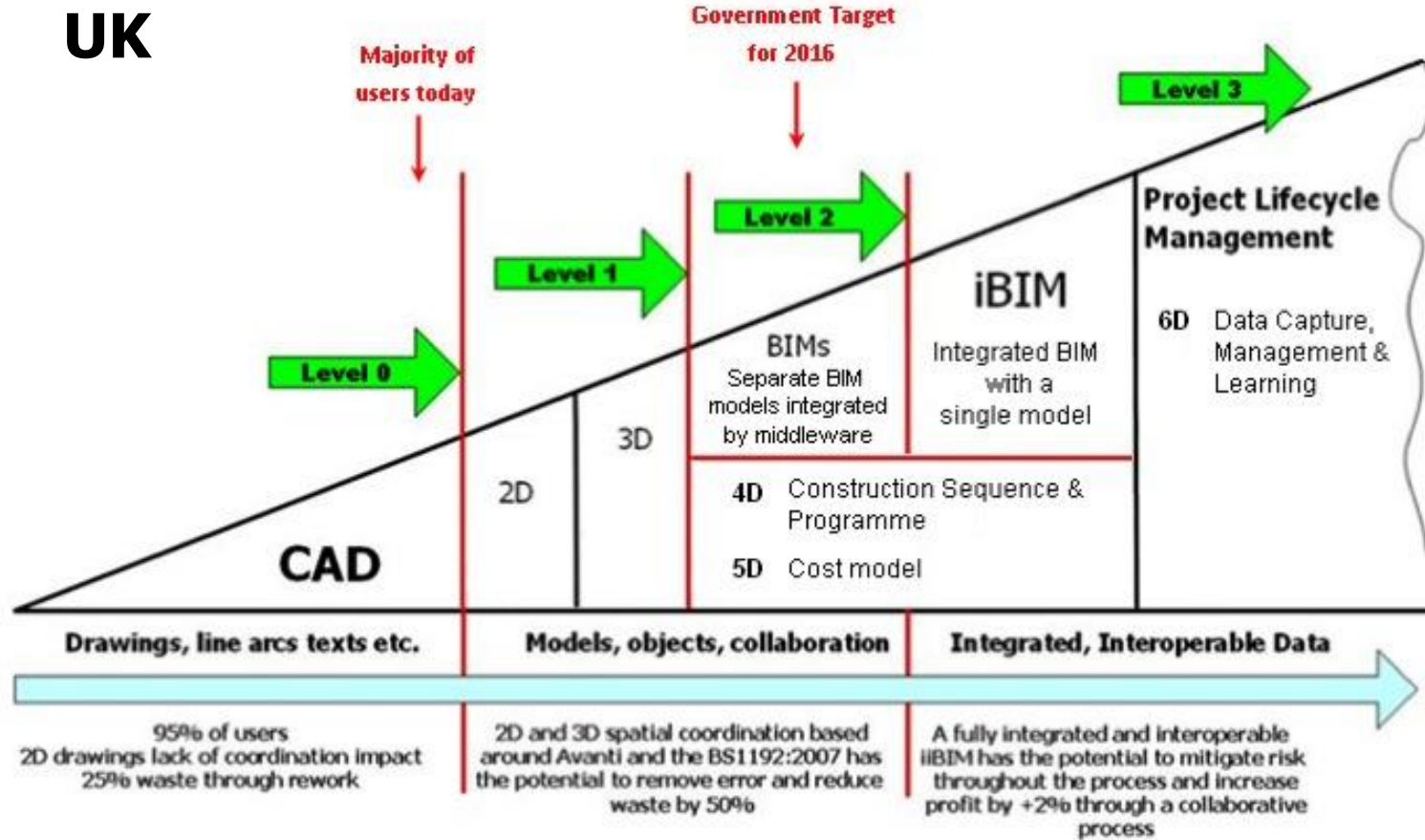
■ Status of BIM adoption globally



1. BIM Adoption

- Increasingly private sector clients require suppliers to apply a BIM approach
- Public sector clients - BIM either has been, or will soon be, formally adopted by Governments in:
 - ▶ Netherland
 - ▶ Denmark
 - ▶ Finland
 - ▶ Norway
 - ▶ UK
 - ▶ European Union
 - ▶ USA –
 - ▶ UAE – Dubai Municipality
 - ▶ Singapore
 - ▶ Hong Kong
 - ▶ Australia
 - ▶ South Korea

1. BIM Adoption



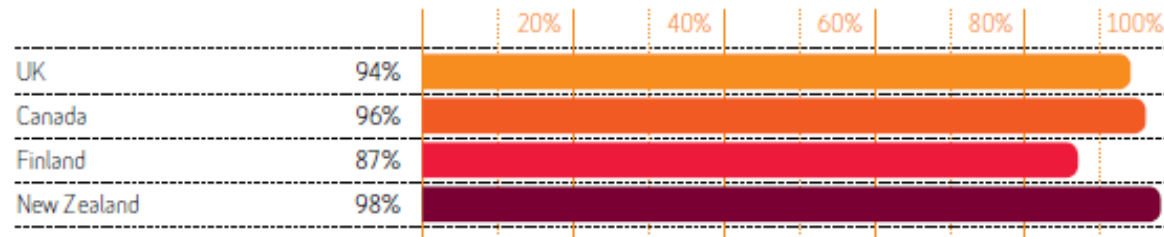
Based on a diagram created by Mark Bew of BuildingSmart and Mervyn Richards of CPIC (2008)

1. BIM Adoption

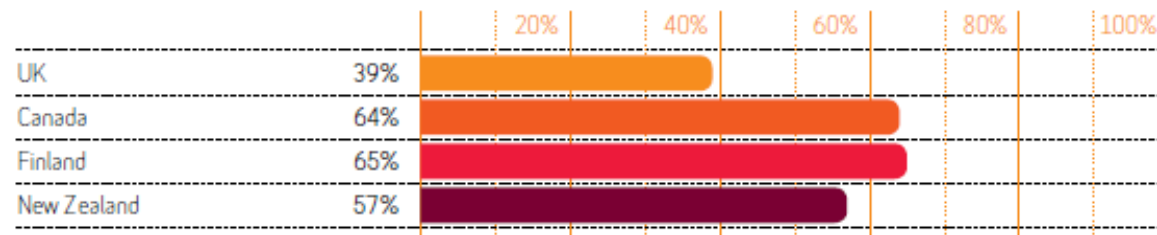
■ Current BIM Awareness

“It’s worth bearing in mind that the survey did not give a definition of BIM. This opens up the possibility that ‘BIM’ has come to mean different things, or to have different nuances of meaning in different countries.”

Awareness of BIM



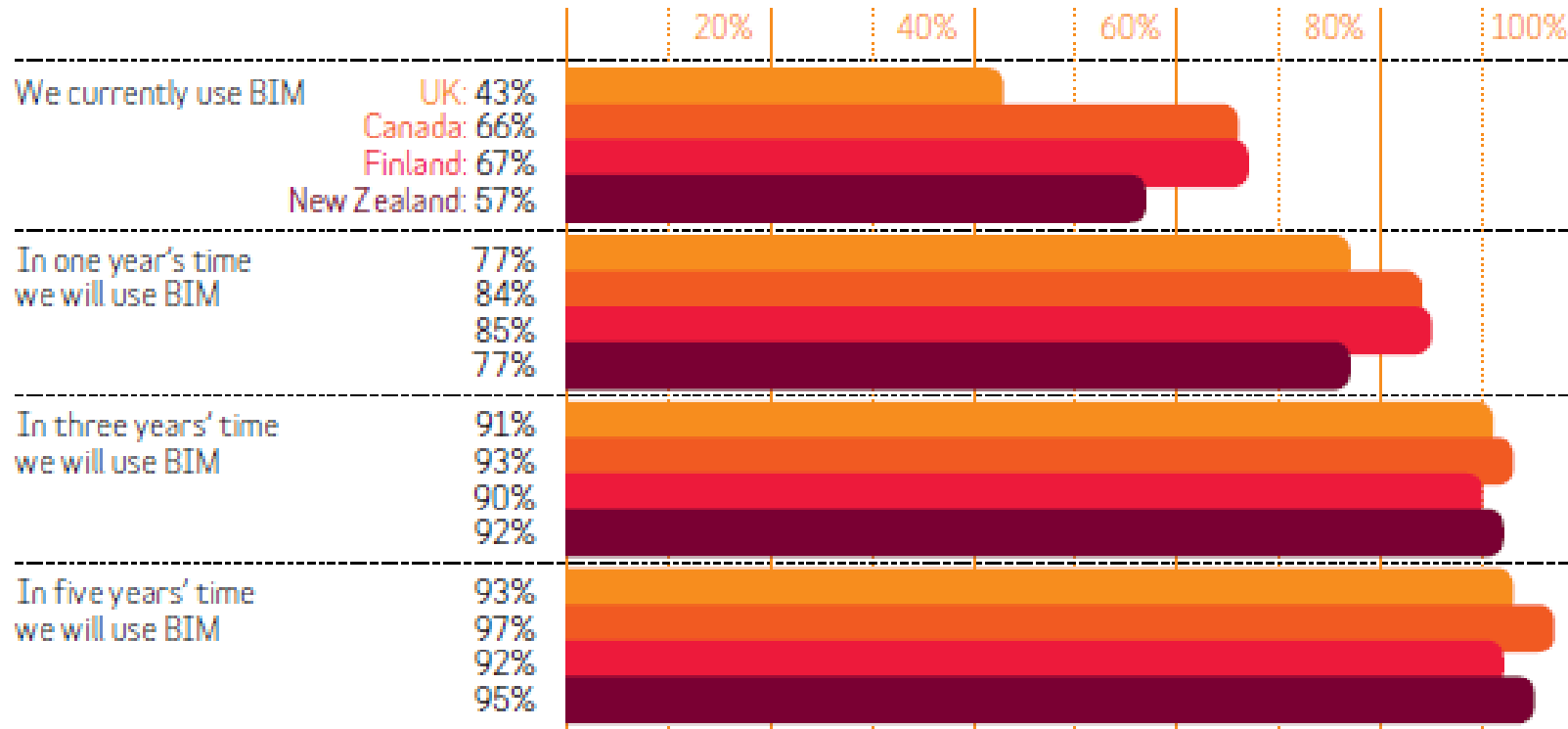
Respondents aware of and currently using BIM



Source: NBS

1. BIM Adoption

■ Future Adoption



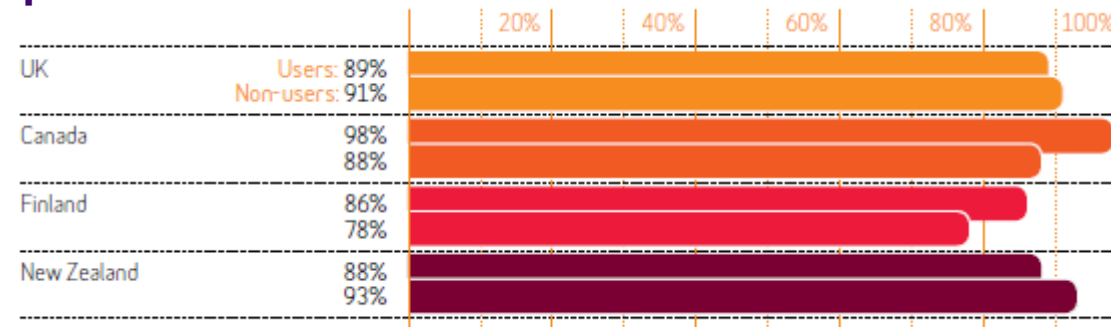
Source: NBS

1. BIM Adoption

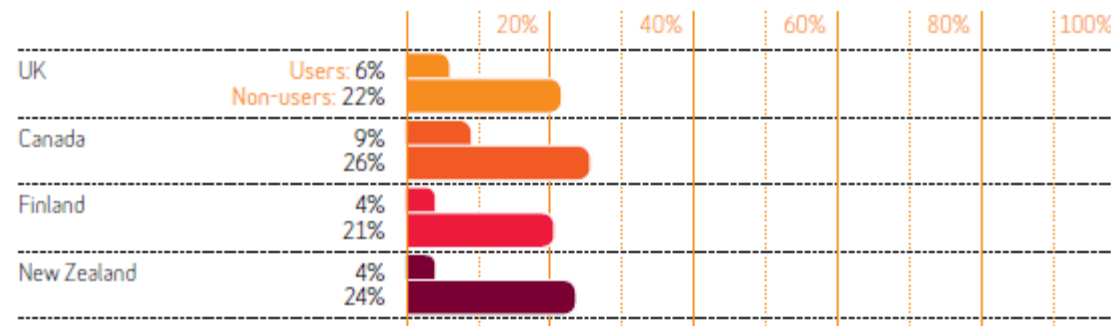
■ BIM and Change

“Across the countries we surveyed, we can see that there is strong agreement that BIM is much more than purchasing and using a piece of software. BIM requires changes... The data suggests these changes are worthwhile.”

BIM required changed in our workflow, practices and procedures



I'd rather not adopt/ I wish we hadn't adopted BIM



Source: NBS

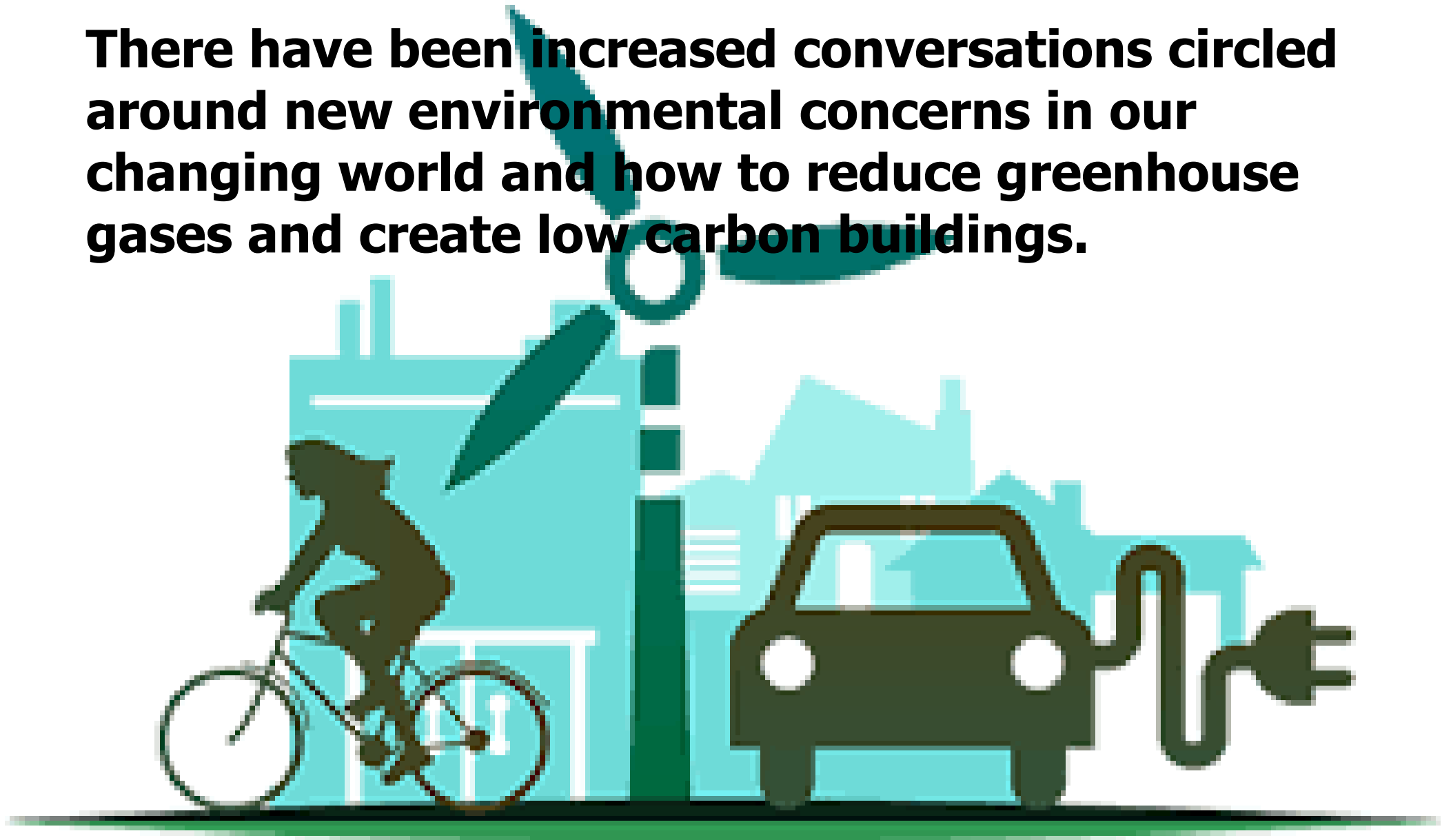
2. Climate Concerns Are Driving Energy Efficient Tech



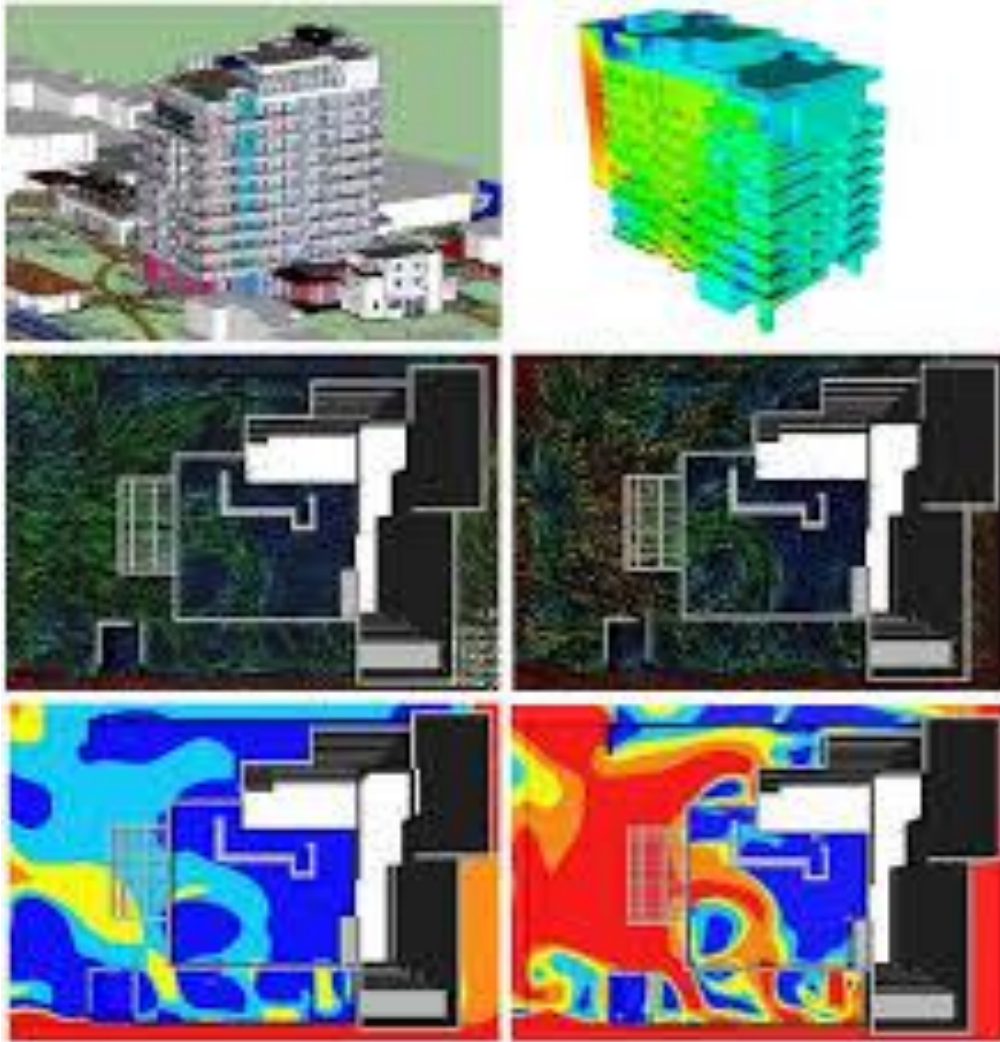
Many countries around the world have taken a strong stance on the policy for climate change, and it's clear this is already impacting the construction industry.

2. Climate Concerns Are Driving Energy Efficient Tech

There have been increased conversations circled around new environmental concerns in our changing world and how to reduce greenhouse gases and create low carbon buildings.



2. Climate Concerns Are Driving Energy Efficient Tech



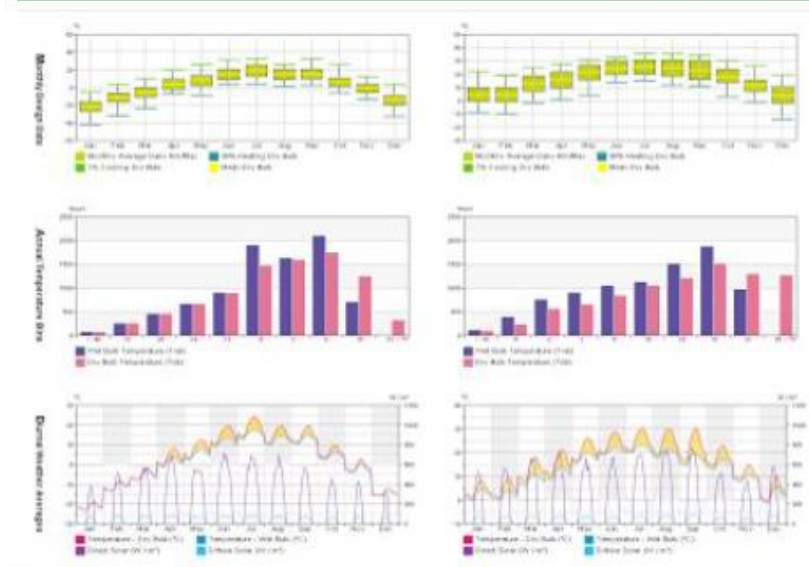
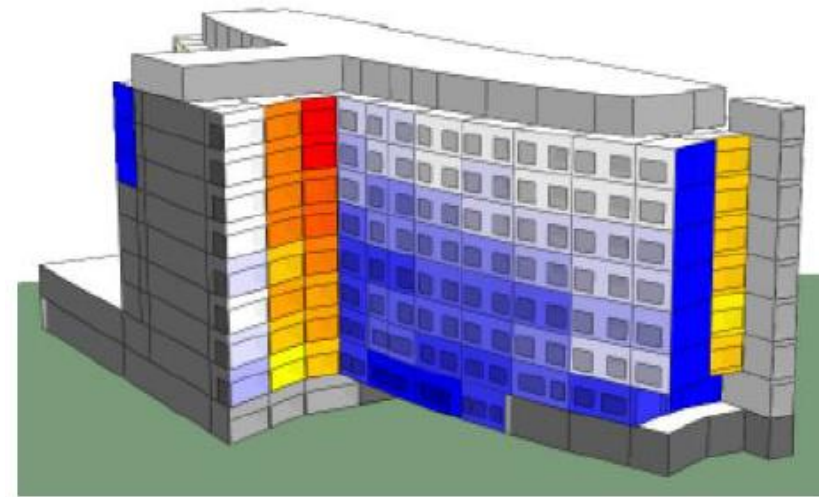
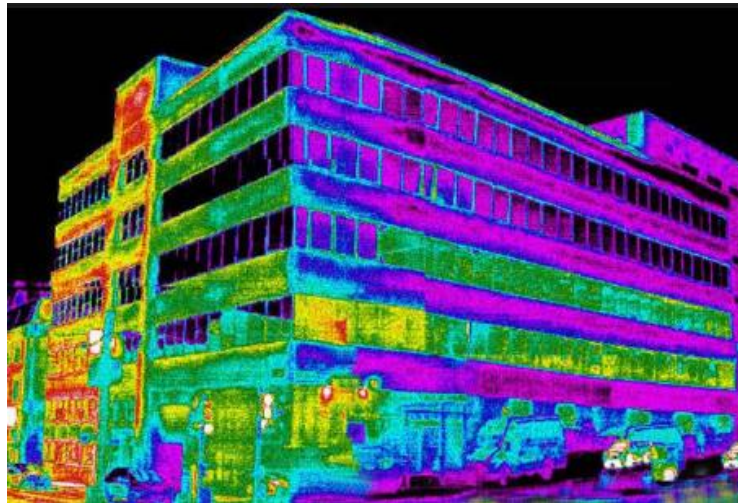
- Today, technology is starting to be implemented in projects to build or analyze data prior to construction, or for analyzation for remodels.

2. Climate Concerns Are Driving Energy Efficient Tech

- ▶ Thermal performance analysis
- ▶ Energy analysis

Result:

- Reduced running cost
- Improved building performance

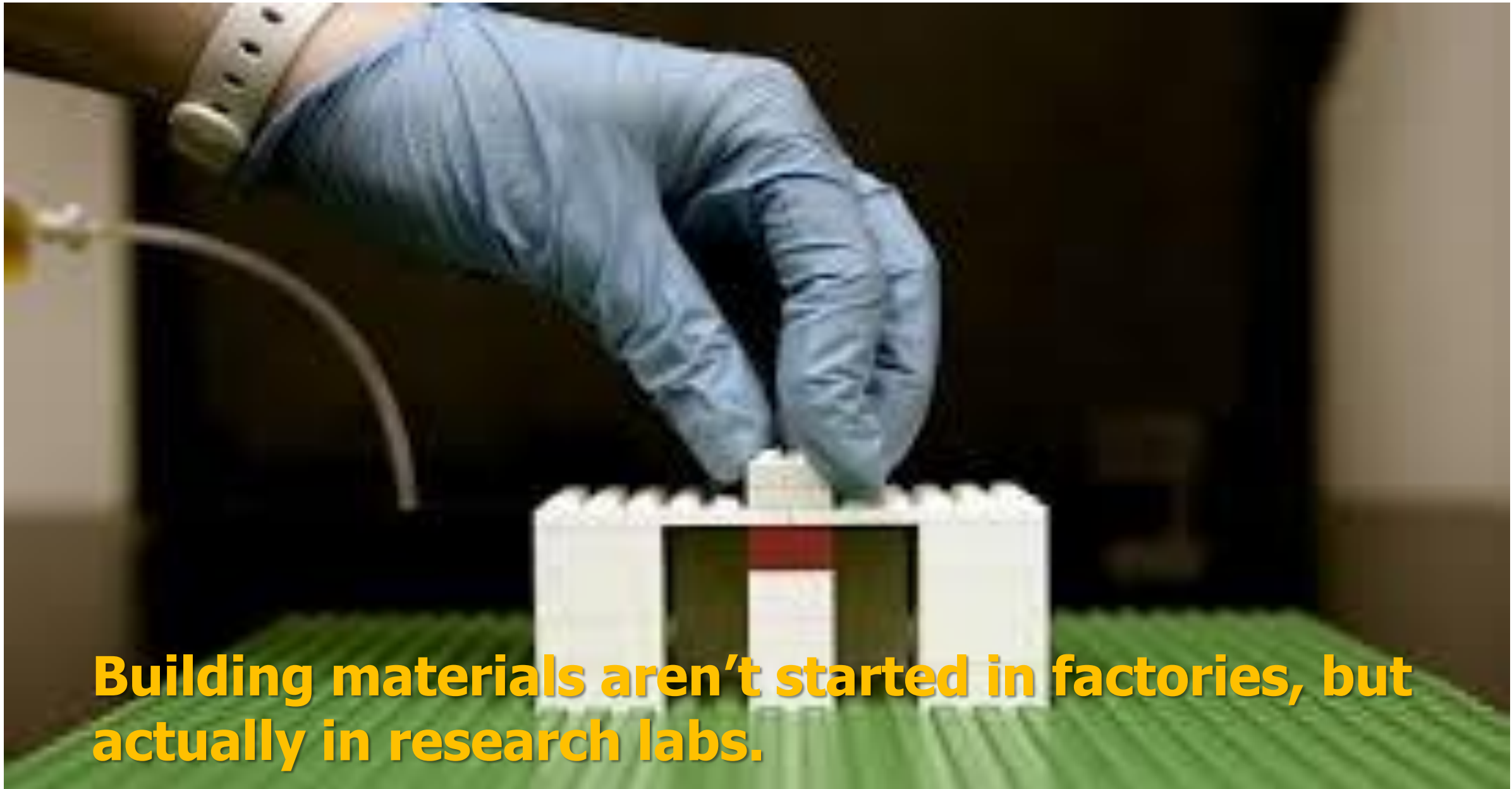


3. Materials Matter in the Future of Construction



- **Modular construction is growing.**
- **In China, a 30-story building was erected in only 15 days using factory-built modules, which Zhang Yue calls “**a structural revolution.**”**

3. Materials Matter in the Future of Construction



Building materials aren't started in factories, but actually in research labs.

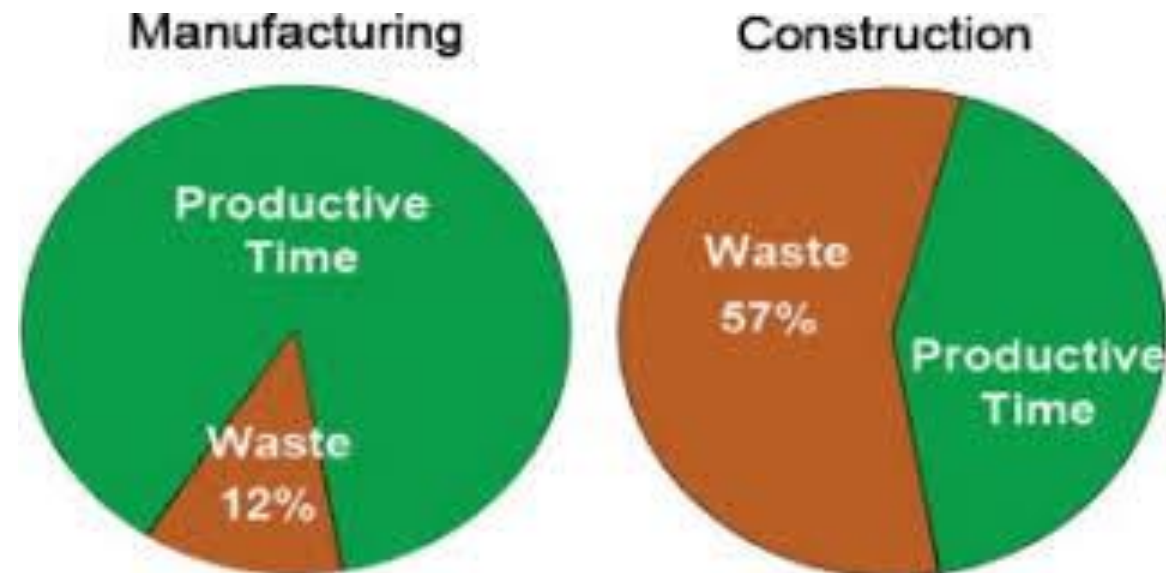
3. Materials Matter in the Future of Construction



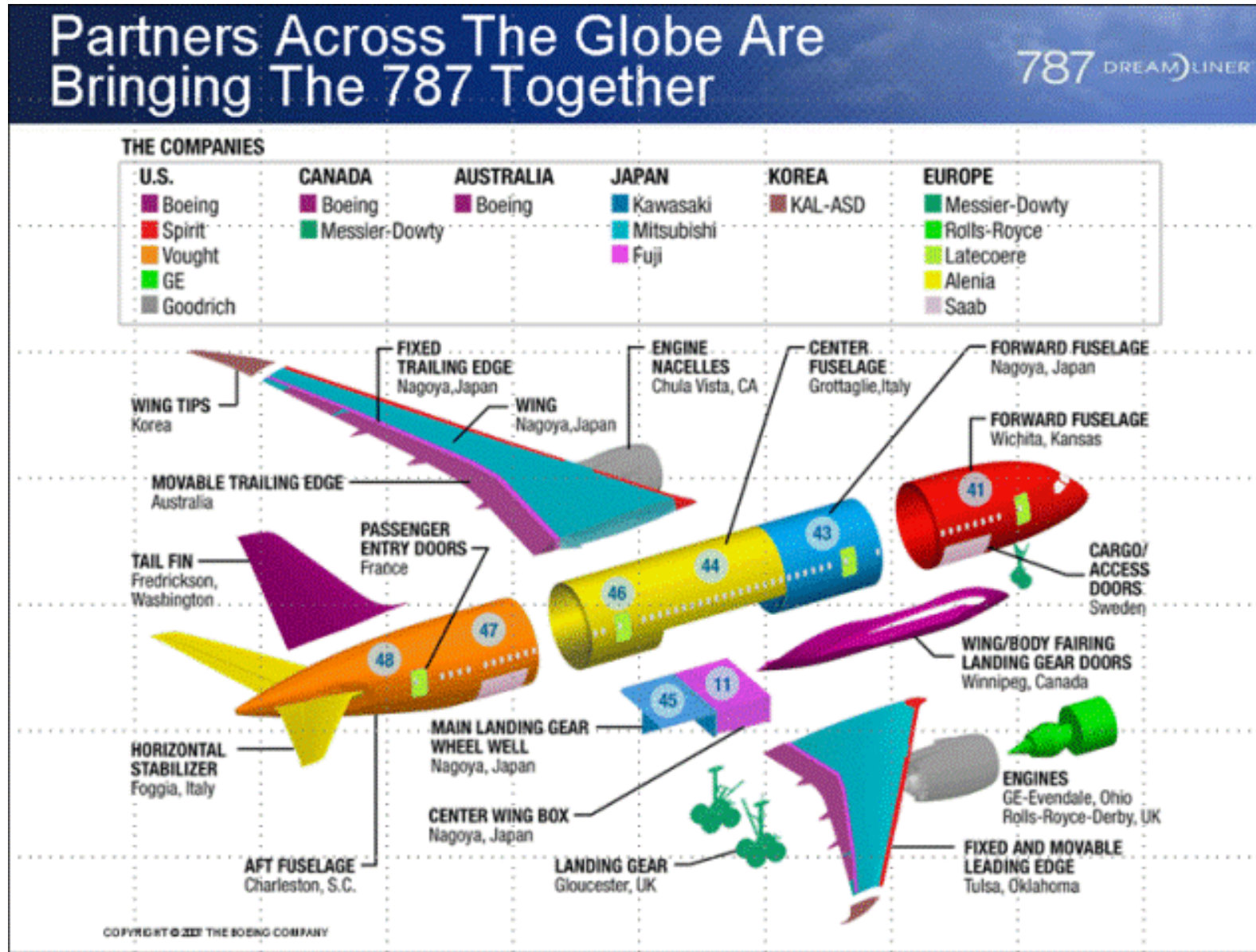
- Evidently, what and how we get the materials we build with is evolving with the integration of technology, and those in the building materials scape should be on the up on innovations that can save both time and money.

3. Materials Matter in the Future of Construction

- **Construction projects have historically suffered from waste and inefficiency, which necessarily have environmental impacts.**
- **Need to address these issues, the AEC industry should take a cue from the manufacturing industry.**



3. Materials Matter in the Future of Construction



3. Materials Matter in the Future of Construction



- **Greater industry adoption of prefabrication technologies, such as modular construction, which will in turn result in greater benefits in productivity, safety and sustainability, in terms of reduced waste.**

3. Materials Matter in the Future of Construction



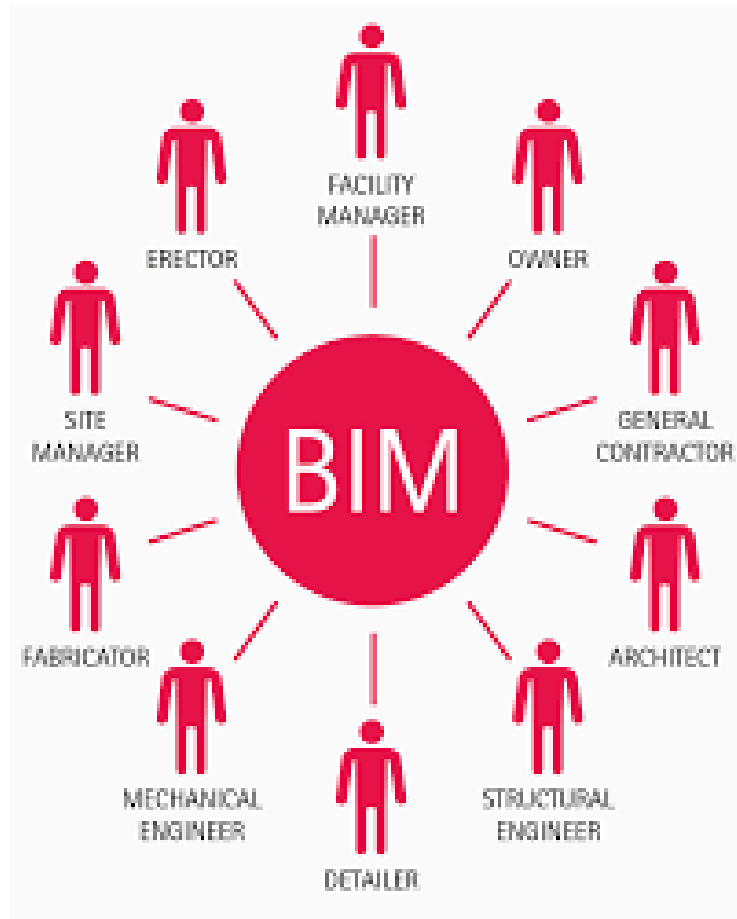
- One tool that may aid in the adoption of prefabricated and modular components is ManufactOn, which enables project stakeholders to track prefab components throughout the construction and delivery phases.

4. Collaboration, Interoperability and Integration



- For the construction industry, especially Project Managers, the word “**collaboration**” might seem like a buzzword.

4. Collaboration, Interoperability and Integration



- **Collaboration for construction means that all project stakeholders can communicate about changes and updates in the moment, on a platform that provides little to no communication barriers.**

4. Collaboration, Interoperability and Integration



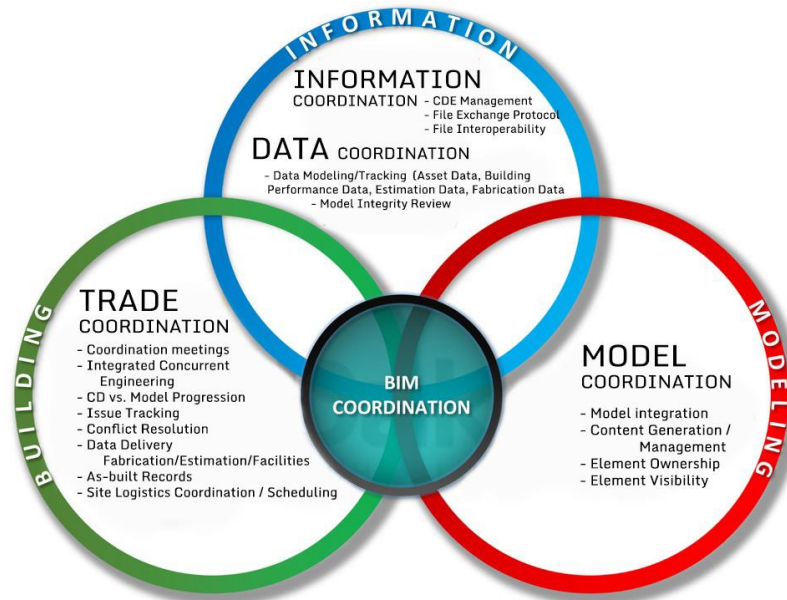
- **Collaboration is all about efficiency, and what that really means for their business when thinking through technology implementation.**

4. Collaboration, Interoperability and Integration

- Perhaps also hindering the adoption of BIM is interoperability and integration.



4. Collaboration, Interoperability and Integration

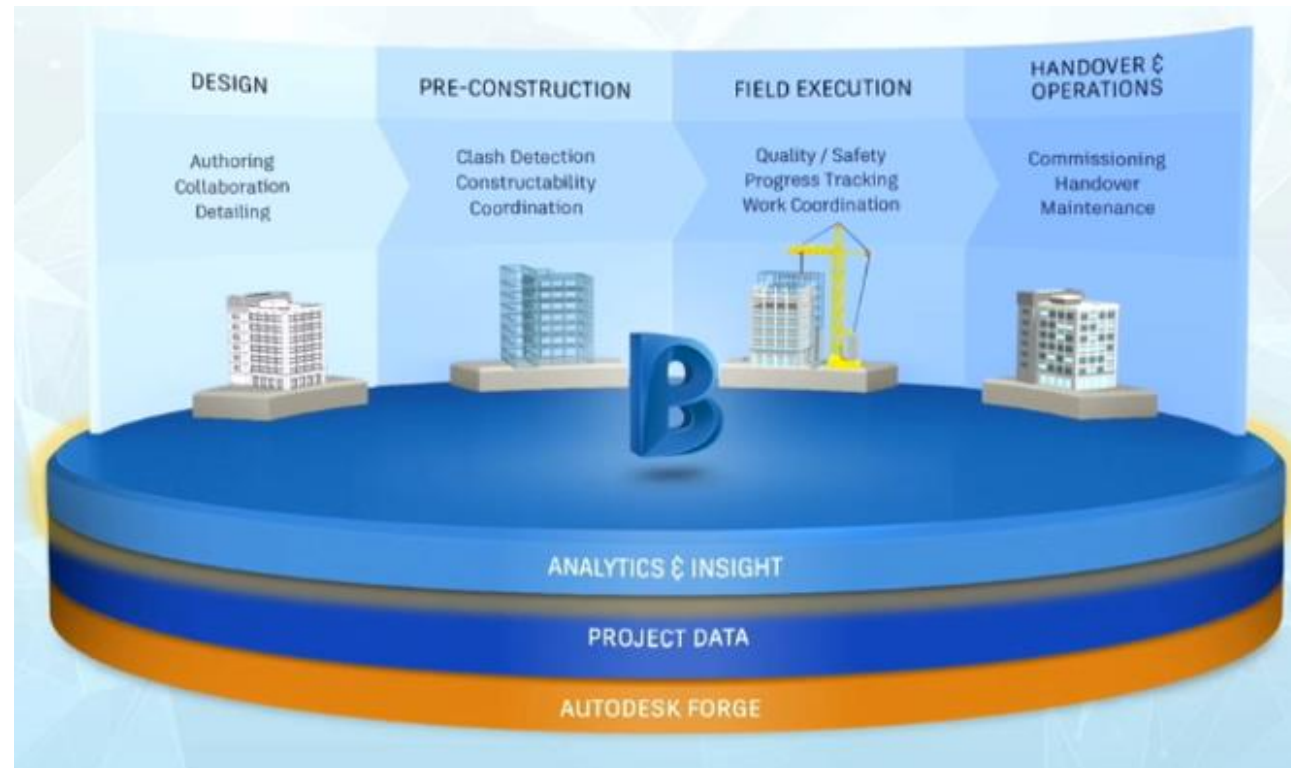


- **Some tools may be less adept at importing data from other solutions, while others may feature numerous different pieces of software that aren't well connected.**

- **One app for cost management, another disconnected app for project management and another disconnected app for model management**

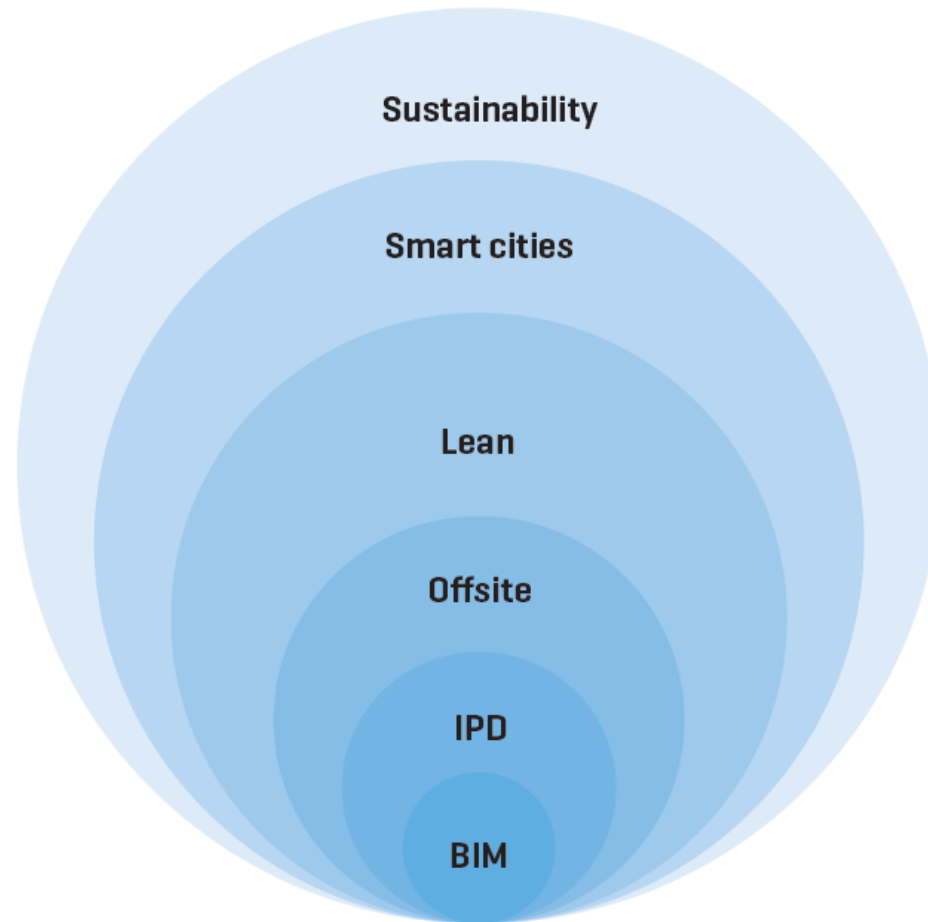
4. Collaboration, Interoperability and Integration

- Autodesk is attempting to address this with the BIM 360 platform. Ultimately, the software company also aims to integrate its other AEC apps, like Revit, with BIM 360 as well.



4. Collaboration, Interoperability and Integration

■ BIM and other complementary paradigms



5. Technology is Driving the New Construction Workforce



- In addition to the labor shortage, the industry is undergoing a generational change and a new wave of workers in construction – Boomers are retiring and Millennials are growing.

5. Technology is Driving the New Construction Workforce



- **With this demographic shift, comes an influx of technology use industry-wide. Millennials are harnessing technology to increase productivity on job sites.**

5. Technology is Driving the New Construction Workforce



- Today, mobile construction software is a driving force for keeping the emerging workforce engaged in their companies and projects.
- Digital Construction is all about wide application of technology (BIM, AI, Robotics, etc.) and digital data for delivering and operating of the Built Environment

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Conclusions

- **BIM is developing and improving rapidly in tandem with growing internet access and capability.**
- **Application of BIM is on the rise!**
- **BIM standards for interoperability and integration are key and have to be addressed.**
- **We need to embrace technology as the tool for productivity, efficiency and profits.**
- **The new generation of professionals in the AEC industry demands the application of technology.**
- **Change is NOW!**

End



THANK YOU

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