

Presentation:

Digital Construction Technologies and Future Skills required

Presenter:

*Gerard Nicholson, B.Sc. (Hons) Arch Tech. M.Sc. BIM, ACIAT*

*Lecturer CAD, Virtual Modelling and BIM at GMIT  
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## Gerard Nicholson

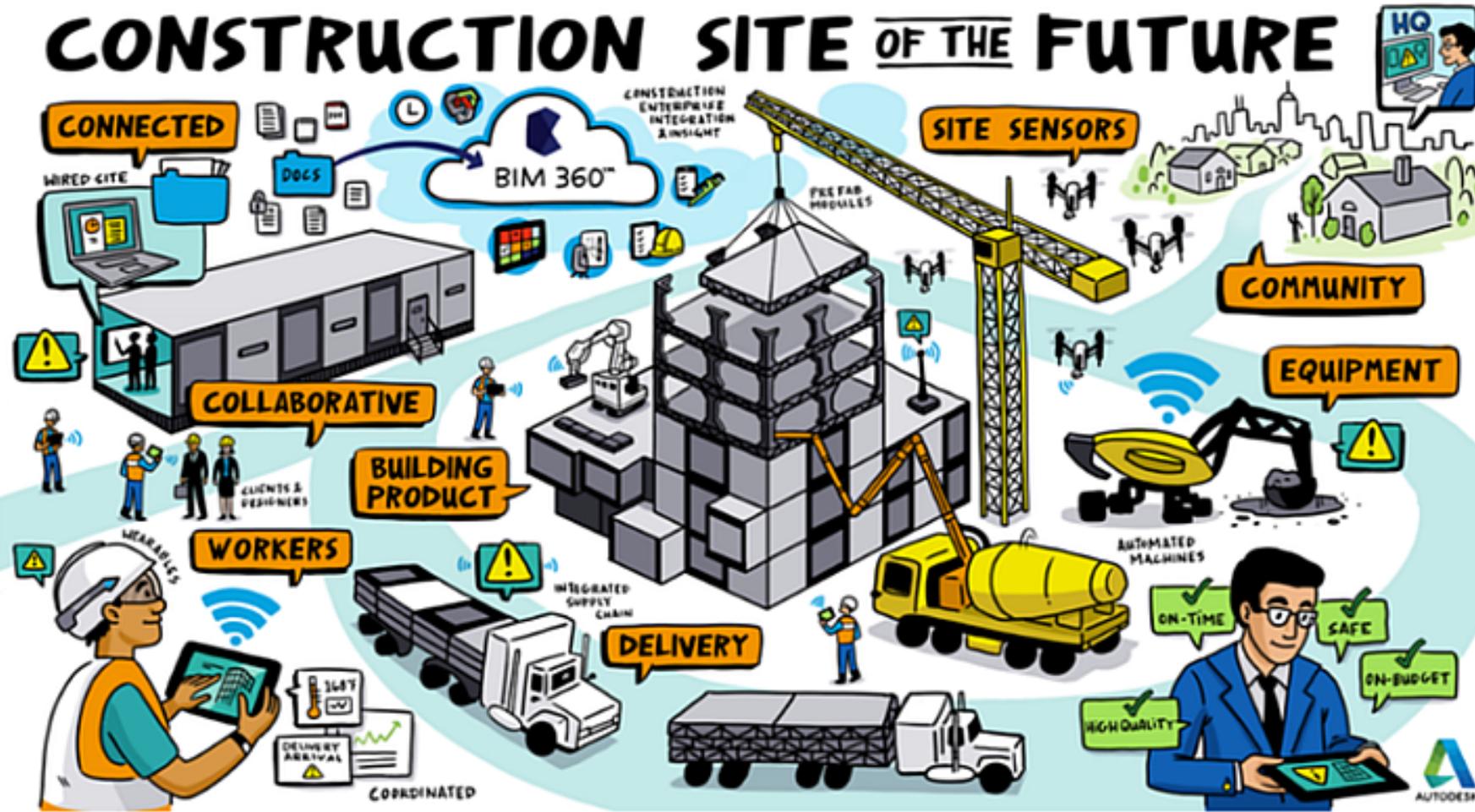
*MSc Res BIM, BSc Hons  
Arch Technology  
BRE BIM Professional, ACIAT*

- Gerard is a lecturer in the Department of Building and Civil Engineering at the Galway Mayo Institute of Technology (GMIT).
- He holds an honours degree in Architectural Technology and a master's degree by research in BIM and project management from GMIT.
- Gerard is currently the programme coordinator and outreach coordinator for the Higher Diploma in Engineering in BIM, which has won multiple awards for its innovation and impact within the industry (Irish Construction Excellence, Delta, Irish Educational Awards, Irish Construction Awards, and HR Leadership and Management).
- Previously, Gerard was BIM manager with RPS on infrastructural and commercial projects. His responsibilities included coordination, monitoring, managing the integration of the BIM models and developing workflows, standards, and protocols. Gerard also contributed to Level 2 BIM certification (ISO 19650) audits at company and project level while working for RPS.





# CONSTRUCTION SITE OF THE FUTURE



## Content for today

- Examples of Automation
- Evolving Technologies
- Emerging technologies
- Enablers
- Skills required

Only a small sample!



Who led the digital transformation in your Company?

- a) Director
- b) Line-Manger
- c) Covid-19

### Digital Construction

- Digital landscape is changing at an ever-increasing speed.
- Some designers spend 70-85% of their time in front of a computer



## Automation in design

- Comes in main forms
- Designing with Visual scripting - Dynamo
- Building models quickly
- Generating information

## Automation in Construction

- Drone Technology
- Excavator automation
- Robot total stations





## Gamification

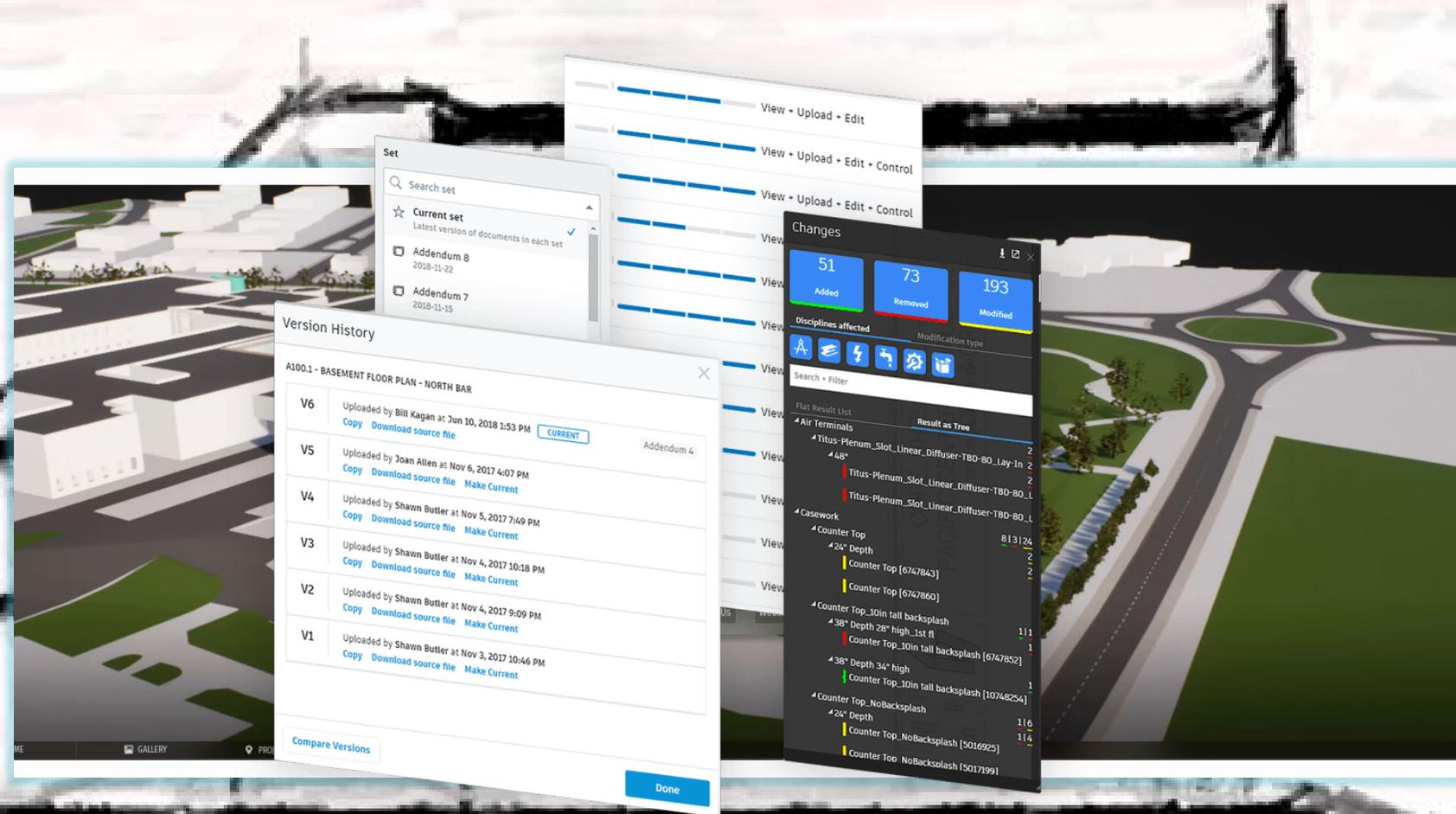
- VR/ AR technology
- Health and safety
- Digital twin

## Big Data

- BIM 360 Capture data
- Data analytics

## AI

- Cameras, AI algorithms, safety etc.





## Robotics

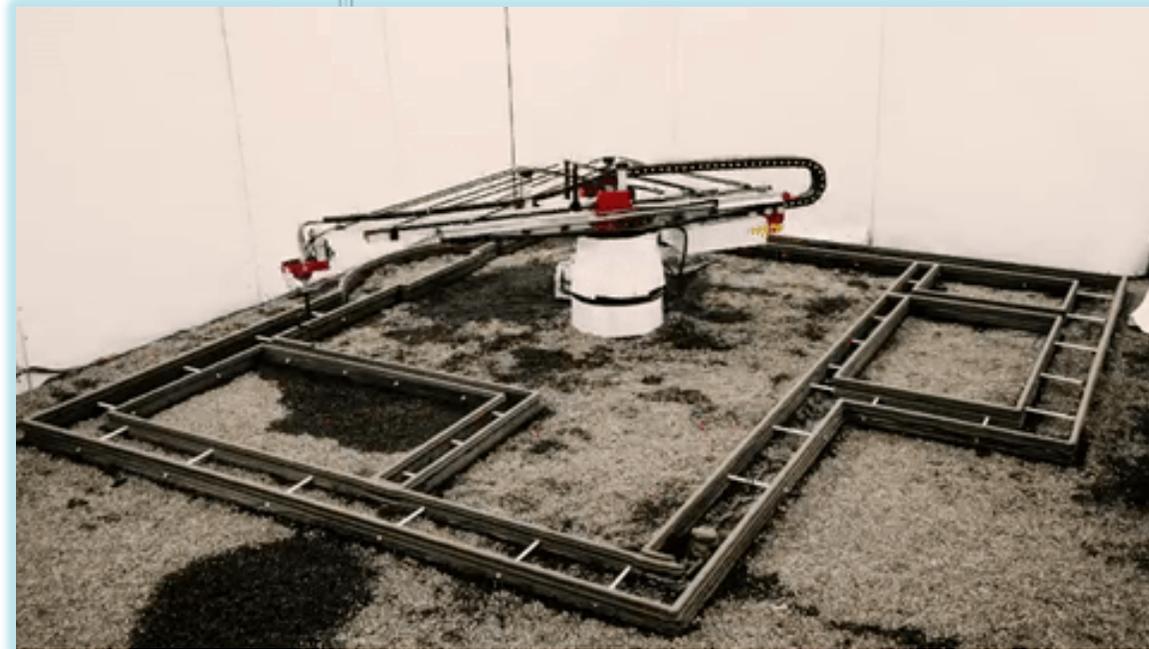
- Brick laying and masonry, Demolition robots, Autonomous excavator etc.

## Generative design

- Generation multiple Options
- Optimize Designs
- Added to Revit 2021

## 3D Printing

- Fabricate buildings or construction components



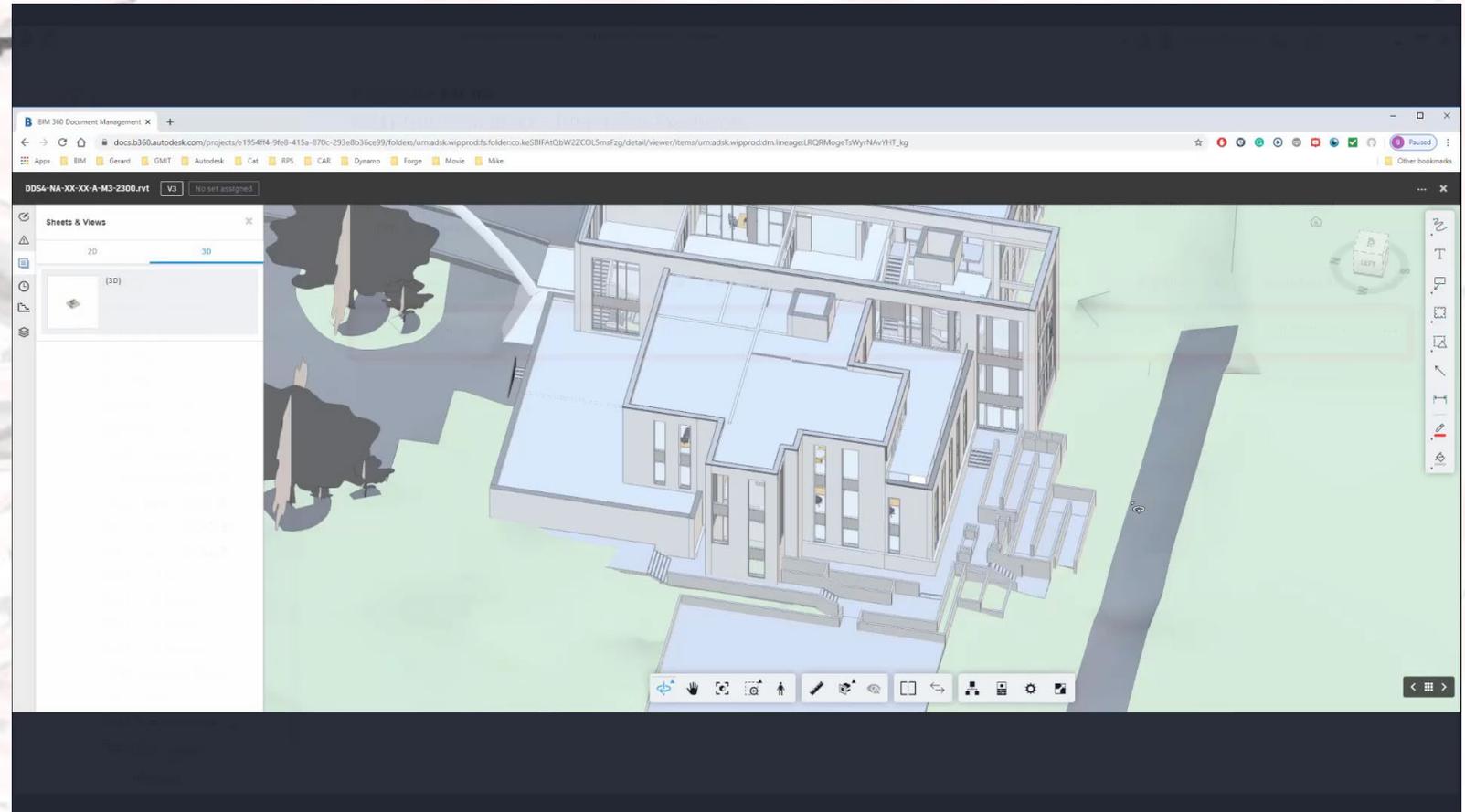


## Technology Enablers

- BIM Model & Process – back to basics
- 5G and Wi-Fi 6
- Cloud Technology
- Graphics and Processor technology

## Regional Enablers

- GMIT, TUD, WIT etc.
- Ensure that we deliver emerging technologies – Undergrad





- Disruptive technology is adjusting our skills need
  - Visual Scripting, computer programming, Data analytics, Gamification etc.
- We need to improve Digital literacy across the built environment
- Collaborative skills in a Digital Environment
- Technology is out of date fast

September 2020

## Building Future Skills

The Demand for Skills in Ireland's Built Environment Sector to 2030

### Minimum Qualifications

- Hands-on experience in either C# or C++
- Proficiency with Autodesk's Revit (BIM) software
- Knowledge of geometric representations and transformations (obtained through experience in 3D CAD modelling, computer graphics, structural engineering, robotics, or any related field)
- Excellent communication skills
- Full-time student pursuing an BSc. or higher in Architecture and Design, Robotics, Computer Science Engineering, or related discipline
- Students must reside and attend university in the country where the internship is being offered

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