

Presentation:

The Value of Visual Programming to Construction Professionals

Presenters:

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

*Lecturer and Programme Coordinator at ATU Galway City Campus
gerard.nicholson@atu.ie*



**ACADEMIC
PARTNER**





Software



**ACADEMIC
PARTNER**



CPD

DCU



Support



Events



Galway & London



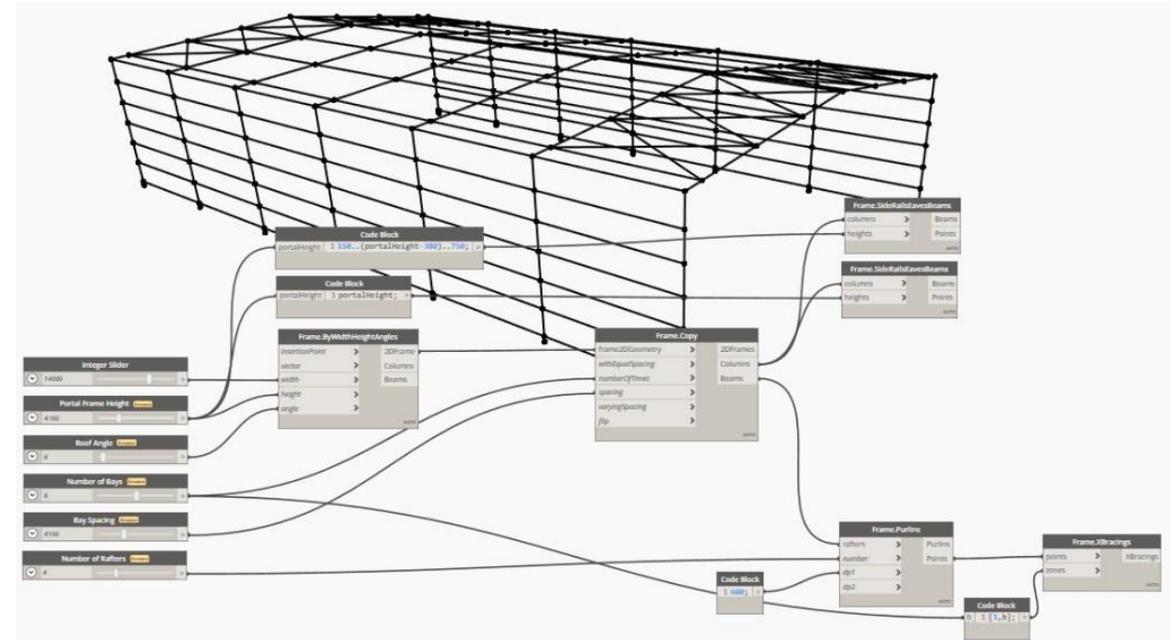


Master of Science in Building Information Modelling and Digital Leadership (90 Credits)

Elective - Visual Programming for Digital Construction (15 Credits)

- To enable digital construction specialists to utilise appropriate visual programming tools to automate, improve workflows and gamify construction projects using a node-based interface.
- Students will require a good understanding and competency of BIM-related software to undertake this module.

100% continuously assessed – 13 Weeks



What is API & Visual Programming?



Application Programming Interfaces (API) using Dynamo

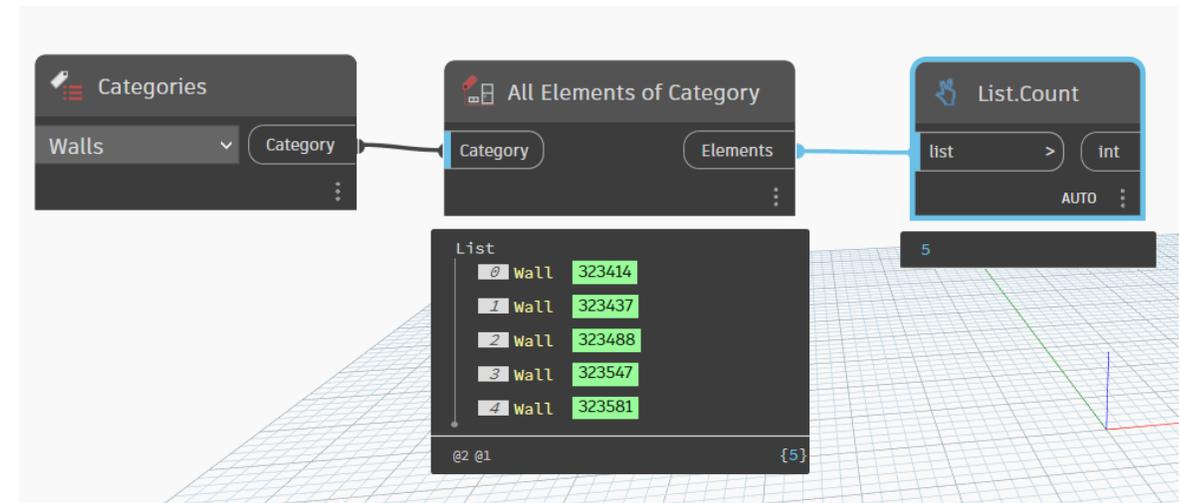
In simple terms, it is what software developers use API to interact with an existing piece of software.

Software developers have been leveraging this API to build Revit and Civil 3D add-ins (typically C# and Python)

Dynamo is a visual programming add-in for Autodesk Revit and Civil 3D. It is the most popular way of developing API's in Revit and Civil 3D.

Allows construction professionals to automate tasks, perform complex designs and manage data without traditional coding

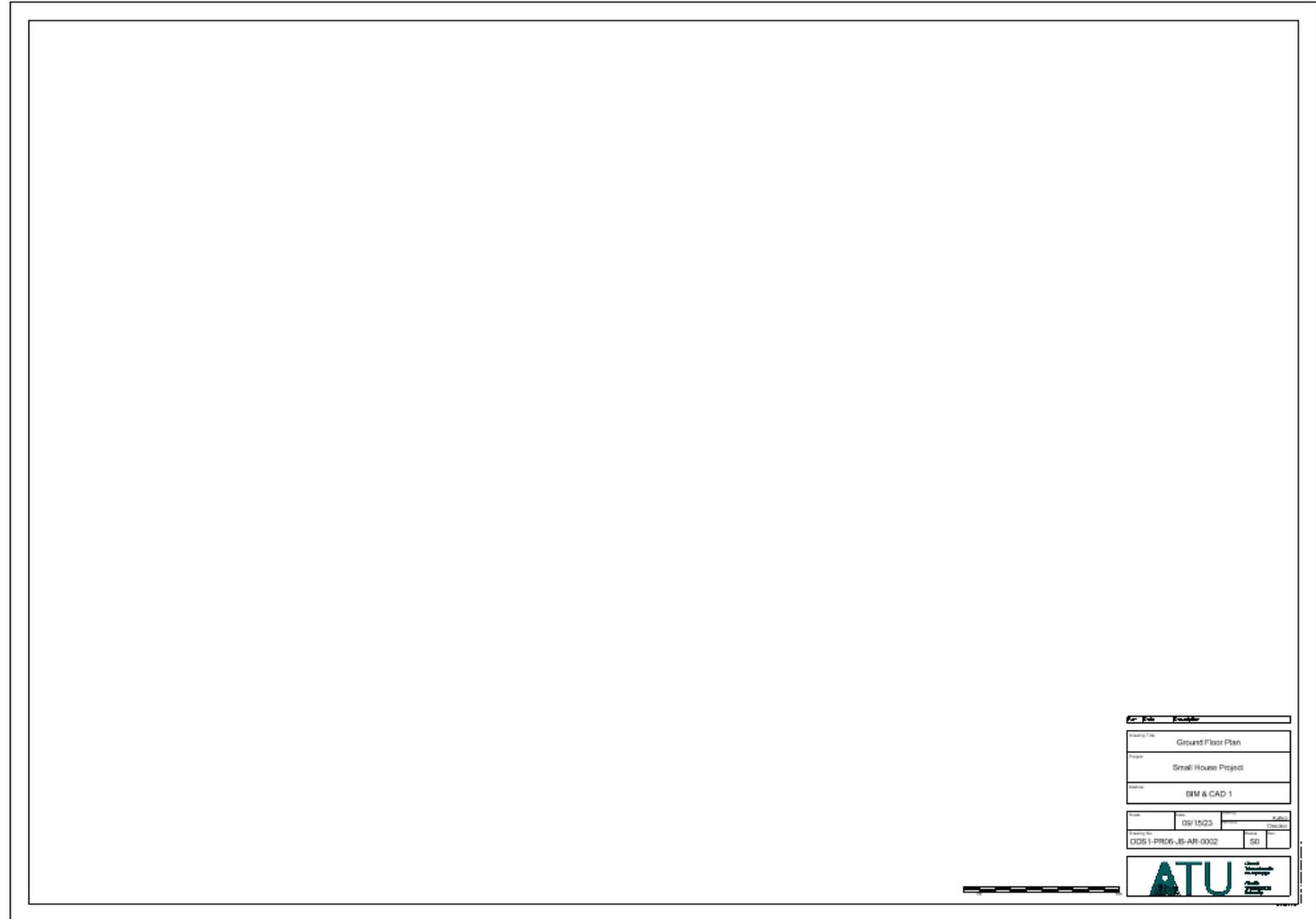
AI Automation – New Buzz Word





The Problem:

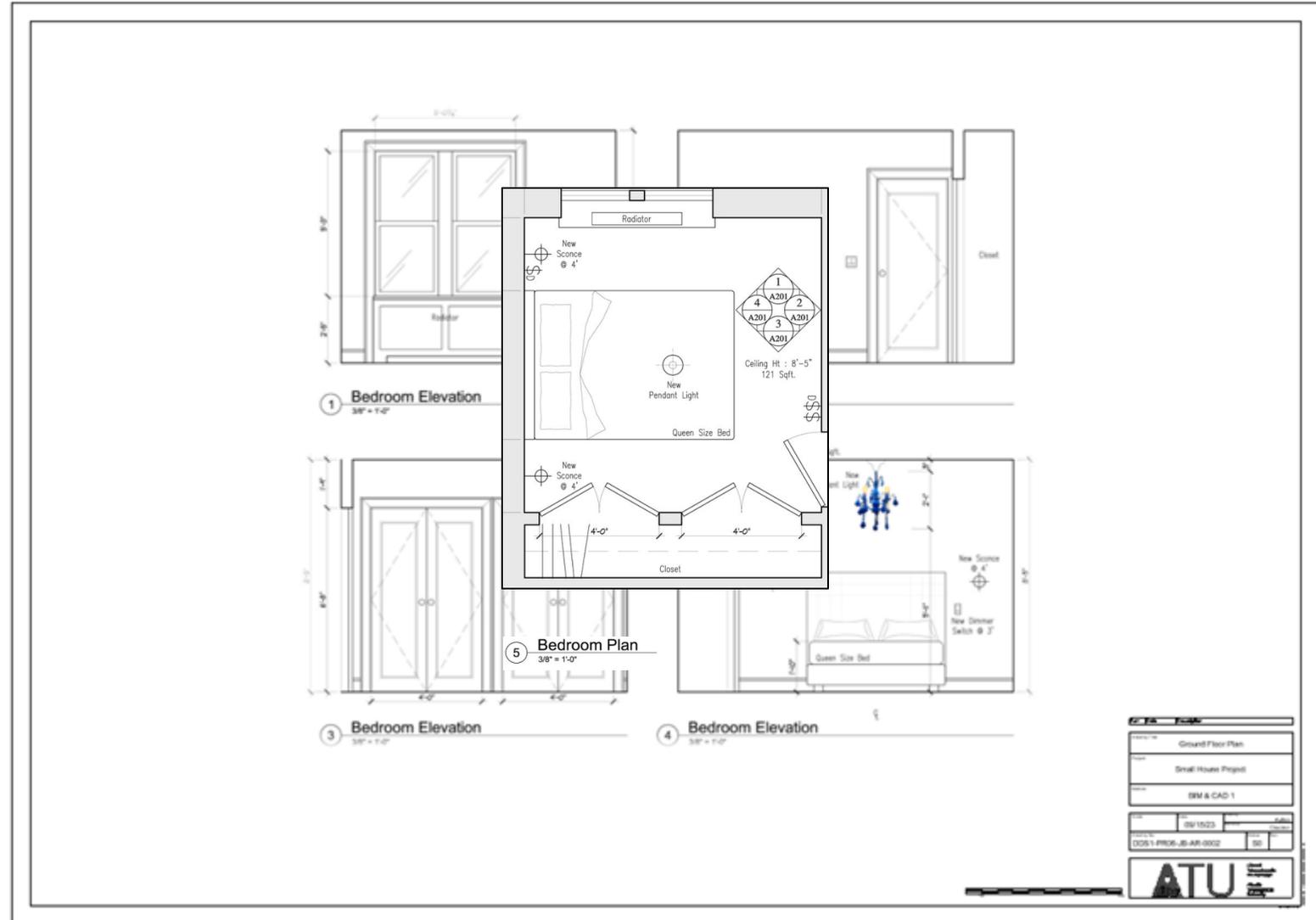
- 100 Rooms – Setup Sheets, Room Plans and Room Elevations
- Traditional workflow – Manually set up sheets, views and place on sheets.

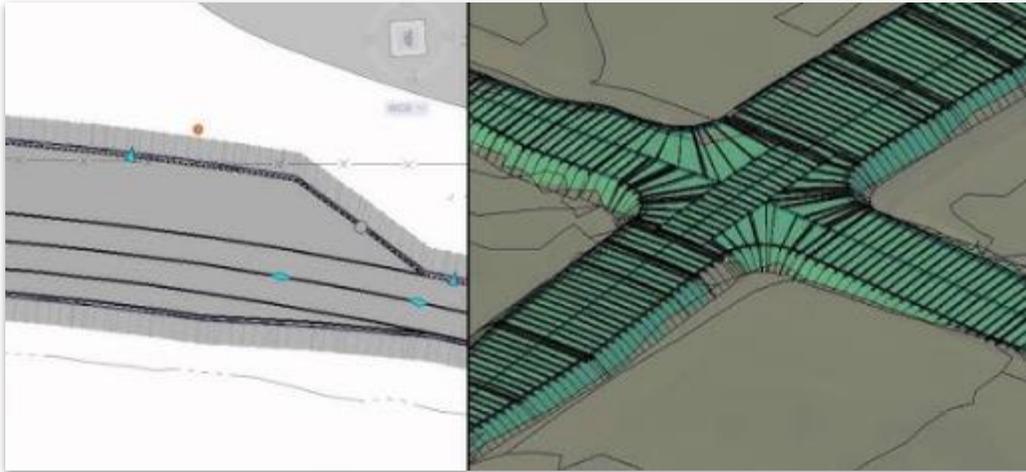




Solution:

- Dynamo API
- Feed Excel to Revit to create sheets with create names
- Select all rooms in Revit
- Create Plans and elevations of each room
- Place on sheets
- Total time to complete task – 1 minute
- 30-minute API development





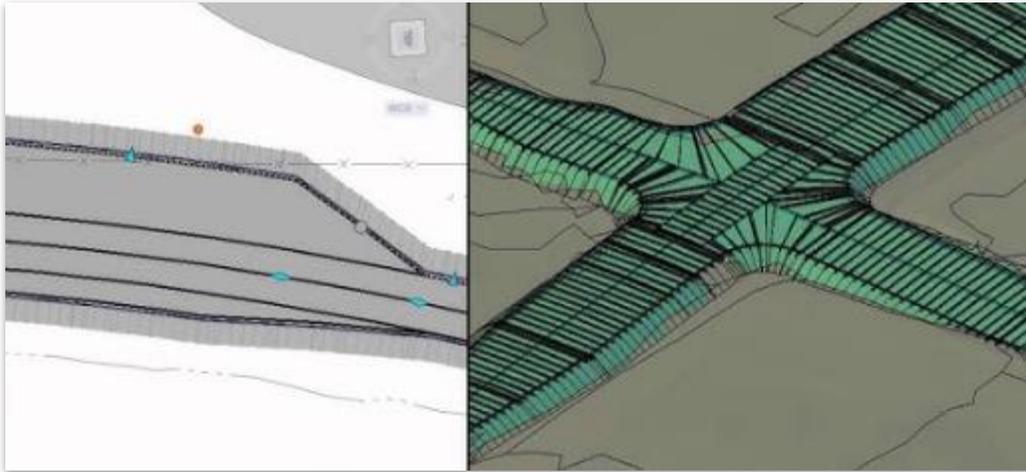
The Problem (2018):

- KeySIGN used to create signs & Foundations
- Creates it to Irish standard
- Creates 3D Model
- Signs overlaid on the surface at the correct **X, Y** Coordinates, but **Z** value 0 on all
- Coordination issue
- Traditional workflow – move signs manually to the correct Z values



Solution:

- Dynamo API
- Select all signs
- Find X,Y Coordinates
- Select surface and overlay coordinates to get the Z value of the surface at the coordinates
- Assign Z value to all signs
- Signs move to correct position
- 5-minute API development
- Total time to move signs – 10 seconds





Survey results from Students who completed the module

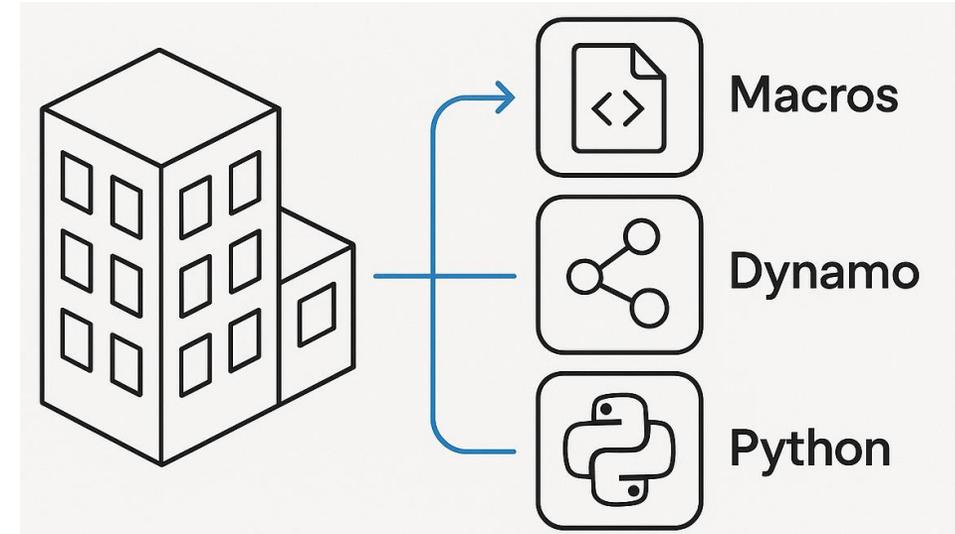
Benefits & Barriers

- Learning Visual Programming added value to Professional Development – noted as useful or highly relevant
- Main uses in Industry - Automating BIM tasks, parametric design and data workflows – 65% have used Dynamo in some capacity
- Motivation to learn more automation tools
- Lack of time to develop/run scripts on projects – all noted this as the number one issue
- Need for management buy-in
- Skills fade without frequent practice





- Effectively builds skills using visual scripting and the student gains an interest in automation
- Employers are generally supportive of new learning opportunities but may lack understanding of the ongoing support employees need afterwards
- Management support / demonstration of ROI
- Limited time to develop or implement scripts on live projects - Allocation development time during projects!
- In the future, we plan to evaluate organisations that support staff in developing and using automation tools to gain efficiencies, cost savings etc.



Presentation:

The Value of Visual Programming to Construction Professionals

Presenters:

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

*Lecturer and Programme Coordinator at ATU Galway City Campus
gerard.nicholson@atu.ie*

Contact us by -

