AUTODESK UNIVERSITY

Navigating the Autodesk Multiverse to Improve Design Productivity

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Who are we?

Dr. Eliel De la Cruz

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I am currently the Practice Technology Leader in the America - East Region for HKS Architects. I was lucky enough to start my architectural career at an early age. I finished a 5-year architecture program when I was 21, then did 2 masters in Architectural Design and Computational Design, (SCAD, and GATech), and later a Ph.D. in Architecture at the University of Sydney in Australia. All my studies and professional experience have revolved around Design and Computational Design. I'm passionate about new technologies and finding ways to use them to improve our designs, buildings, cities, and our lives. My area of research focuses on understanding the variables that influence the adoption of new technology in the architectural design process.

I'm a geek who loves movies, anime, bowling, archery, guitar playing and learning new things in life. Cheers!

John Raiten

I am currently the Practice Technology Leader in the America - Central Region for HKS Architects. I have been in the AEC industry for the last 29 years, and recently 10 years were on the construction side. Some of the companies I have worked at are Gensler, Friedmutter Group, Hill & Wilkinson, and Rogers-O'Brien Construction. The years building and working in VDC departments on the construction side of things gave me a unique aspect of how models are used through out the design and construction process. My next endeavors at HKS will help the world to move closer to informative and accurate model deliverables.

My hobbies include motorcycles, swimming, beaches, travel, and music.

AGENDA

What we'll be covering today

1. Understanding alternative workflows using Autodesk tools to deliver a project.
2. Implement an effective tool LOD limit and multiple workflow health checks.
3. Investigate the use of an eclectic and flexible learning process to improve upon each design round.
4. Identify opportunities using generative design, visual programming, and upcoming Autodesk tools for early design exploration.

PRELUDE

What this class is about

As technology continues to evolve and provide the AEC industry with new tools, the pressure from clients and owners to deliver faster and better outcomes also increases. Within Autodesk's 'Multiverse' of tools spanning multiple industries, designers usually need to figure out how to best utilize the tools currently available to efficiently produce appealing designs with reduced roadblocks. By understanding which tools to use, organizations can potentially save costs and avoid the dreaded re-work in the design process.

In this class, we'll discuss the impact and opportunities of several workflows and trends in relation to the architectural design process. Find out how you can leverage Autodesk tools and software to drive efficiencies and innovation in your processes that will benefit your company, enable a faster decision-making process, and improve your designs and your bottom line.


Workflows
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Architectural Design Process

Traditional Linear Approach

The Design Process is an approach that divides a large project into manageable phases.

- Pre-Design (Programmatic)
- Schematic Design (Conceptual Design)
- Design Development
- Construction Documents
- Bidding
- Construction Administration

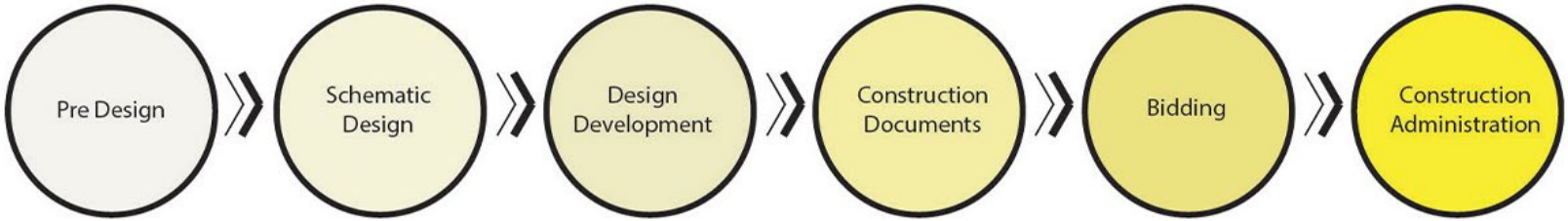


Image Source: https://www.modal-design.com/blog/architecture-design-process/

Design Thinking

Non-Linear Approach

Because the architectural design is an ill-defined (wicked) problem this methodology can also be applied.

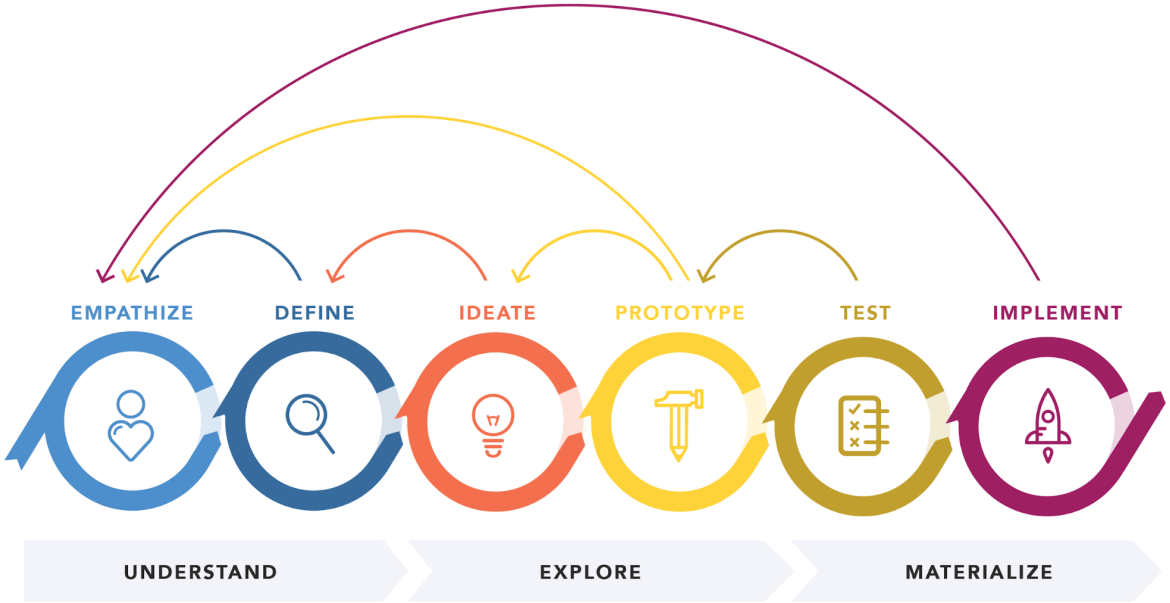


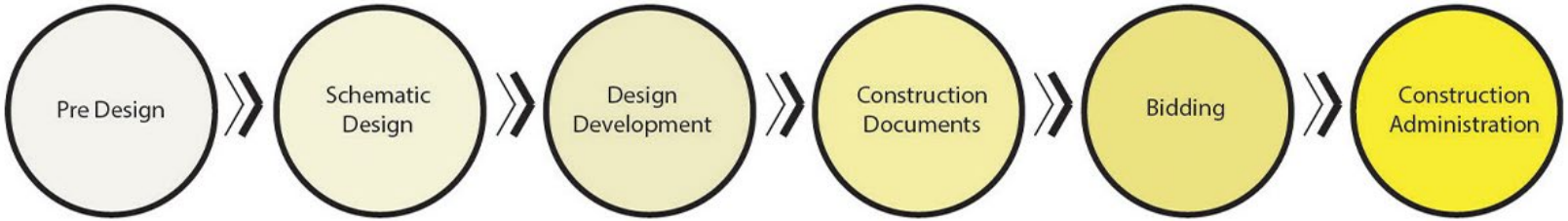
Image Source: https://www.nngroup.com/articles/design-thinking/

If we transpose this concept to software

Traditional Linear Software use

Disclaimer: We know everyone has their own way of doing things, this is just one of many possible scenarios.

Excel SketchUp Revit ACC (BIM Collaborate Pro) Newforma



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Design Thinking

Non-Linear Software use

Having a broader scope of software options provide a much more flexible design environment.

AutoCAD

SketchUp

3ds Max

Autodesk Rendering

ACC (BIM Collaborate Pro)

Autodesk Docs

Civil 3D

dRofus

Excel

FormIt Pro

ReCap Pro

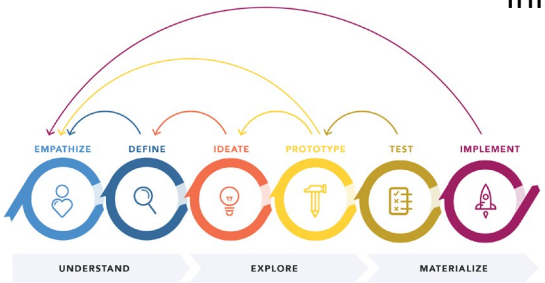
InfraWorks

Revit

Insight

Desktop Connector

Navisworks Manage



Newforma

Procore

Build


Choosing the Tool

The right tool for the right task

When to take the leap

Understanding when to use one of those tools requires knowing about Productivity, Return of Investment (ROI) and looking at the bigger picture in order to improve upon each design round

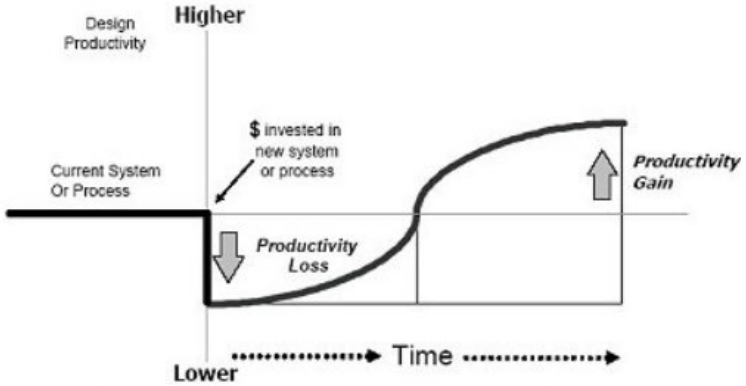


Figure 1. Visualize what happens when you put a new system into place.

A standard formula for calculating the first-year ROI is in figure 2. It uses just a few key variables related to system cost, training, and the overall productivity cost savings of a system. The next figure shows the formula variables (figure 3).

$$\frac{\left(B-\left(\frac{B}{1+E}\right)\right)\times(12-C)}{A+(B\times C\times D)} = \text{First Year ROI}$$

Figure 2. A standard formula for calculating first-year ROI.

A = cost of hardware and software (dollars)
B = monthly labor cost (dollars)
C = training time (months)
D = productivity lost during training (percentage)
E = productivity gain after training (percentage)

Figure 3. The ROI formula variables.

Image Source: https://skills4future.mk/bim-benefits-fit-for-the-new-millennium/


All the Tools!
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Autodesk's Software and Cloud Services

- There is a smorgasbord of different software and cloud services available from Autodesk
- Which software to use for your Industry or Trade?
- Do any of these overlap between Industry or Trade?
- How do you know if you need to learn a new software?

AEC Collection

(Architecture, Engineering & Construction)

Building Design, Infrastructure Design, Construction (Industry)

- FormIt Pro
- Revit
- Civil 3D
- AutoCAD
- InfraWorks
- Navisworks Manage
- 3ds Max
- ReCap Pro
- Insight
- Vehicle Tracking
- Advanced Steel
- Structural Bridge Design
- Fabrication CADmep
- Robot Structural Analysis Pro
- Autodesk Docs
- Autodesk Rendering
- Autodesk Drive
- Desktop Connector

Autodesk Construction Cloud Products

Online services that enhance the workflow

Build

BIM Collaborate

BIM Collaborate Pro

Takeoff

Docs

Additional Products

PlanGrid Build

Assemble

Building Connected

Pype

ProEst

AutoDesk Construction Cloud Connect

Architecture

Some of the software and services used in Architecture

- FormIt Pro
- Revit
- Civil 3D
- AutoCAD
- InfraWorks
- Navisworks Manage
- 3ds Max
- ReCap Pro
- Insight
- Vehicle Tracking
- Assemble
- Prospect (VR)
- The Wild (VR)
- Dynamo & Generative Design
- Takeoff
- BIM Collaborate Pro
- Build
- Autodesk Docs
- Autodesk Drive
- Desktop Connector
- Autodesk Rendering

Engineering

Some of the software and services used in Engineering

- Revit
- Civil 3D
- AutoCAD
- InfraWorks
- Vehicle Tracking
- Fabrication CADmep
- Robot Structural Analysis Pro
- Insight
- Navis Manage
- Advanced Steel
- Structural Bridge Design
- BIM Collaborate Pro
- Autodesk Docs
- Autodesk Drive
- Desktop Connector

Dynamo & Generative Design

Construction

Some of the software and services used in Construction

FormIt Pro

Revit

Civil 3D

AutoCAD

InfraWorks

Navisworks Manage

Dynamo & Generative Design

ReCap Pro

Vehicle Tracking

Fabrication CADmep

Point Layout

Inventor

Assemble

Pype

Building Connected

Takeoff

BIM Collaborate Pro

Build

Autodesk Docs

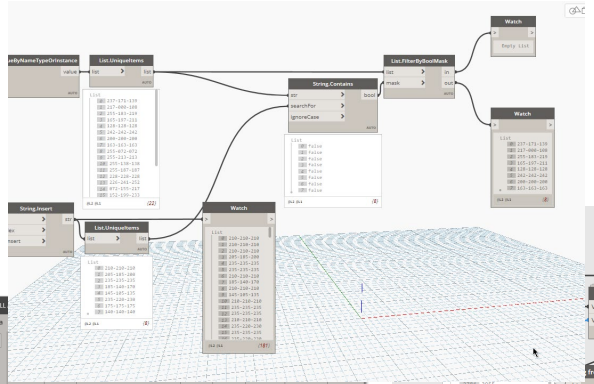
Autodesk Drive

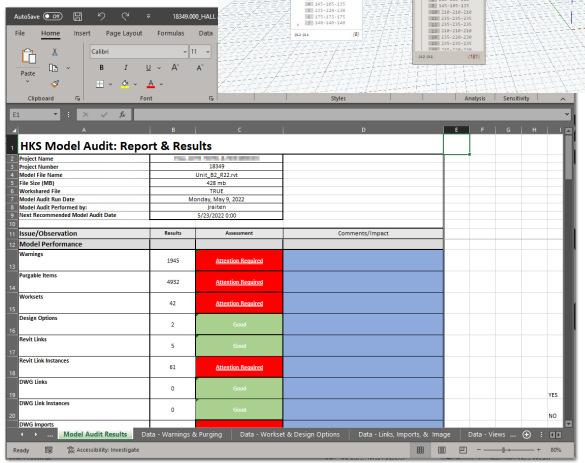
Desktop Connector

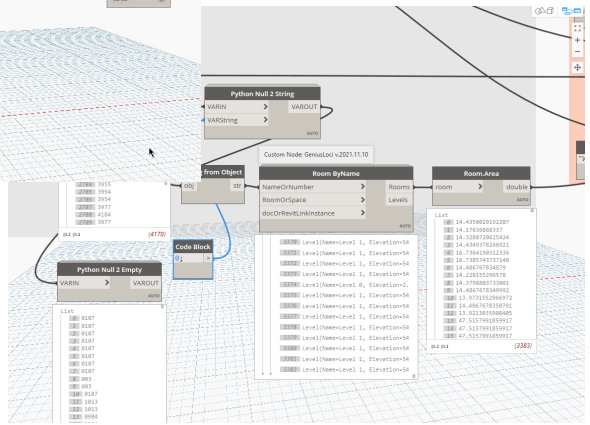

Opportunities

Dynamo & Generative Design - Visual Programing

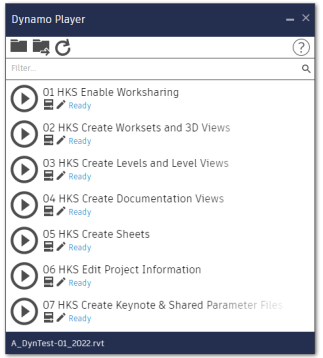
A number of programs can utilize Dynamo & Generative Desing for automation







Dynamo



Civil 3D
Revit
FormIt
Alias
Advance Steel
Robot Structural Analysis

Thank you