468508

# Deploying Dynamo to your Company: Getting Everyone to Node and Code

Tadeh Hakopian
HMC Architects

## Learning Objectives

- Learn about the necessary technical infrastructure to deploy Dynamo company-wide across offices and users.
- Learn how to create consistent Dynamo scripts for the company and keep them updated as the software and user needs change.
- Discover what you need to get your company for Dynamo training and understand the standards for script editing.
- Discover the methods of deploying Dynamo scripts and third-party packages, and learn about the best option for your organization.

## Description

For years Dynamo users have achieved productive gains in their project teams with visual scripting. But what if the whole team was using it? Now is the time to move this tool from the individual to the collective by enabling every user to use Dynamo systematically in the company. See how it's possible to help organizations with hundreds of designers access shared Dynamo scripts and resources in a coordinated and effective way. This includes centralized script repository, templates for Dynamo scripts, how to vet content suitable for your company, version control of scripts, and managing third-party packages for everyone. By enabling everyone access to Dynamo and getting them to use it, the gains in productivity for your teams will be felt and digital transformation will get a boost. Learn how to make it happen with this class.

## Speaker(s)

[Add your bio(s). Photos are not required, but you can add one if you choose.]

# About the speaker

## Tadeh (Todd-A) Hakopian

**Tadeh leverages BIM, VDC and Design Technology to provide his teams with impactful tools for project success. He has over 8 years of experience in the AEC field developing methods and practices to enhance project outcomes. With a background in Architecture he has worked with designers, engineers and contractors in all phases of building design and construction. Over the years he has been a part of large, complex projects in Commercial, Sports, Education, Healthcare and Residential sectors. His current focus is on design automation, data insights in projects and comprehensive workflows that come full circle in planning project life cycles. He is an active speaker at conferences and his local community meetups. Current Professional Goals Help move the AEC profession into new horizons using value driven solutions and innovative research.**

## OVERVIEW / OUTLINE

Overview

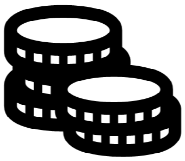
- What Dynamo is and how it works stand alone with Revit
- Benefits of using Dynamo
- Challenges to deploy it company wide

Outline

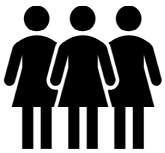
- Intro
- Premise
- Overview
- HMC Situation
- Before you Get started
- Goals And Vision
- RoadMap
- Installs
- Training
- Content
- Launch
- Post Launch
- 3rd Party solutions
- Long Term Planning
- Lessons Learned
- Outro

## BEFORE YOU GET STARTED

Budget time – Schedule milestones



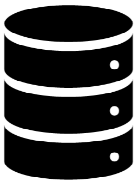
Get people to work with you – Have a beta team to work out the kinks



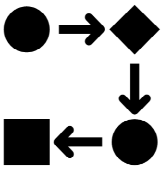
Know what you are trying to achieve in specific terms with goals and deadlines

## GOALS AND VISION – COMPUTATIONAL DESIGN

Data incorporated into the Design process



Improved workflows with Automation methods

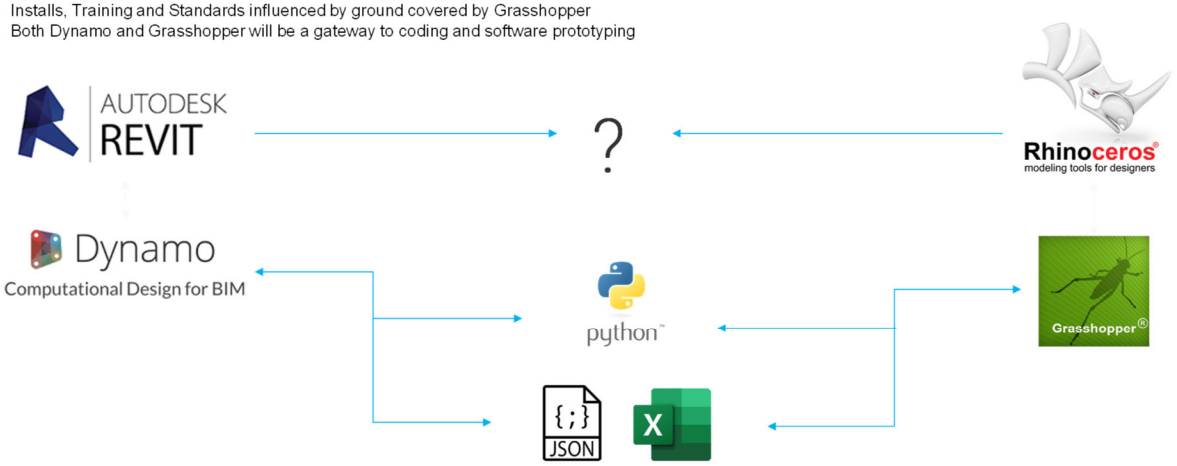


Develop better tools and systems to facilitate the design process and create better deliverables

## GOALS AND VISION – VISUAL SCRIPTING

Develop a game plan for visual scripting in general:

1. Dynamo deployment influenced by earlier Grasshopper deployment
2. Installs, Training and Standards influenced by ground covered by Grasshopper
3. Both Dynamo and Grasshopper will be a gateway to coding and software prototyping




https://parametricmonkey.com/2019/11/20/rhino-inside-revit/

## GOALS AND VISION - DYNAMO

Create scripts for studio use

Dynamo player is accessible for all staff – anyone can run scripts

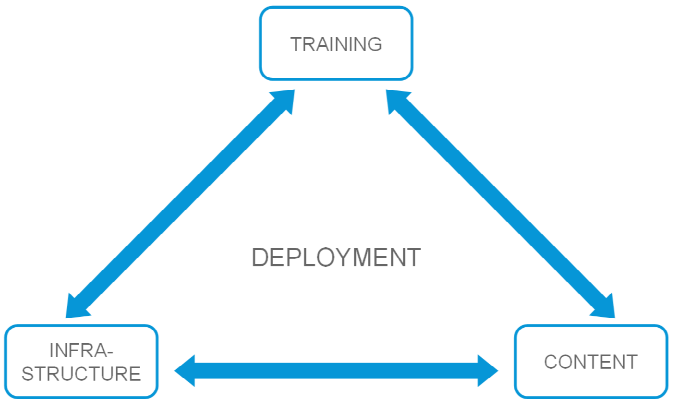
Track usage – who is using dynamo and which scripts to help improve adoption and support

## GOALS AND VISION

Training – Knowledgeable users who can work self-sufficient

Infrastructure – Tools to support the users

Content – Resources and Materials to enable users to work with the system provided




## ROAD MAP

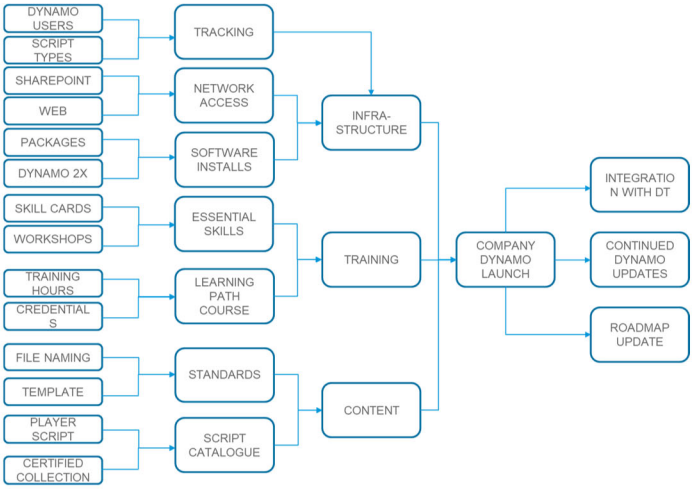
Roadmaps and charts can be a big benefit to visualize a strategy to a launch

Organize all the steps in each stage to ready launch

Start from the end – Determine the launch date and everything you need to get there

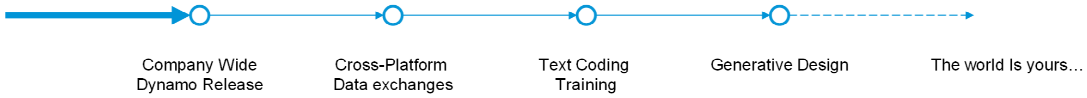
Each broad category needs to be divided into essential completions

From there you can list all the actual work you need to do and who you need to work with in order to do it



## ROAD MAP – LONG TERM

Don't stop at Launching Dynamo, keep going!



## INSTALLS – MAIN PART

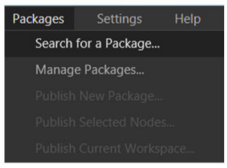
Dynamo 2.X

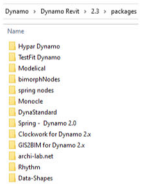
One version to rule them all
1.X is obsolete and can confuse users when opening Dynamo from Revit

**https://dynamobim.org/to-dynamo-2-0-and-beyond/**

Specific Packages

Vet the package for 2x compatible release
Install system with SCCM / Software Center




**https://dynamobim.org/issues/extend-dynamo-with-packages/**

Revit 2018 and newer is preferred

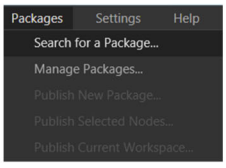
Regularly update Revit and roll your models to the most recent year release

**https://dynamobim.org/dynamo-2-0-4-hotfix/**

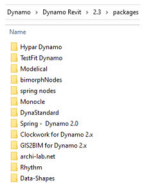
## INSTALLS - METHODS

No 'best way' to install Dynamo Packages but you have some choices:

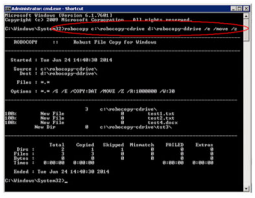
Package Manager



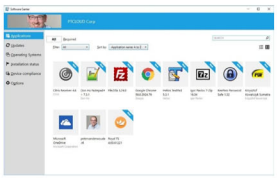

Copy From a Central Location




Bat Copy (Robo-Copy)
https://adamtheautomator.com/robocopy-the-ultimate/



Software Center (SCCM)



* More on this from Archsmarter: https://archsmarter.com/office-hours-200430/

## INSTALLS – FILE PATHS

Dynamo Settings .xml
C:\Users\thakopian\AppData\Roaming\Dynamo\Dynamo Revit\Version
* Xml file contains the list of paths Dynamo will use to load packages

paths for sharepoint collection (does this belong here?)
C:\Users\thakopian\HMC Architects\Digital Practice - Documents\Design Technology\Scripts

Dynamo Settings:
C:\Users\thakopian\AppData\Roaming\Dynamo\Dynamo Revit
* Each version of Dynamo installed has its own folder to manage

Package Locations vary per Dynamo install
C:\Users\thakopian\AppData\Roaming\Dynamo\Dynamo Revit\2.3\packages

Temp files:
C:\Users\thakopian\AppData\Local\Temp\47f9f94f-013a-49b6-a89b-f582aca0dbcd

Dynamo Player Script samples: 2019-2021….

Local user information defaults:
C:\Users\thakopian\AppData\Local\dynamoplayer-2\User data\dynamoplayerinstance 1
C:\Users\thakopian\AppData\Local\dynamoplayer-3\User data\dynamoplayerinstance 1
* These folders track your last load location of Dynamo player scripts, delete folder to revert to original sample location

* See more from Dana De Filippi on Preparing for deployment: https://youtu.be/KZWcs9nDbZU

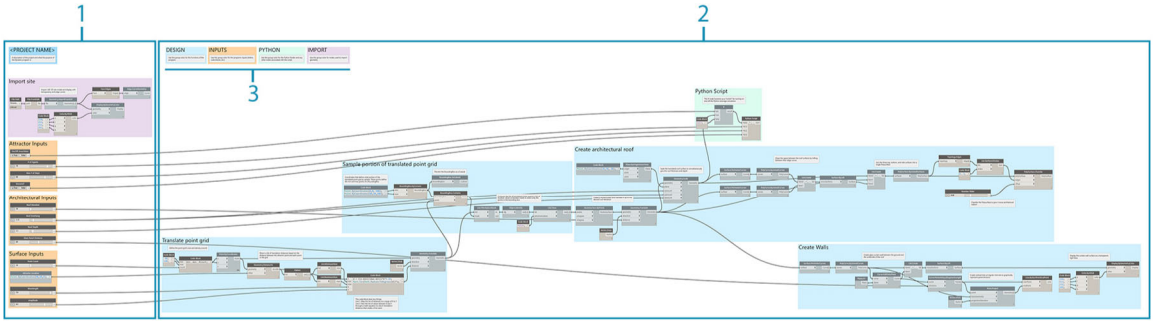
## CONTENT - TEMPLATES

Create a standard format for all graphs

Set the template file into an accessible location
https://forum.dynamobim.com/t/can-i-start-dynamo-with-a-template-instead-of-a-blank/15002/13

*Also possible to use Monocle Package for this effort

Train users to read and use this system




## CONTENT - TEMPLATES

Create easy to read grouped blocks for every script

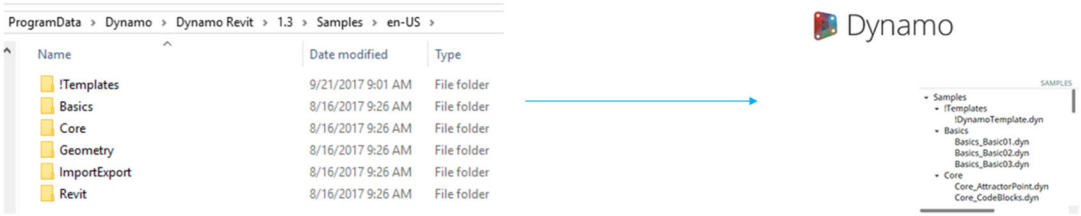
Input: For incoming references such as file paths and geometries.
Control: For the use of input(e.g. sliders, numbers, etc.)
Design: For back-end functionality
Utility: For canvas/cable management

Bake: For nodes to bake geometry
View: For viewing text/geometry in the rhino viewport
Revit: For grouping Revit interoperability components
WIP: Work in progress

## CONTENT - TEMPLATES

Create easy to read grouped blocks for every script

A workaround is to save any "template" files in your examples folder. C:\ProgramData\Dynamo\Dynamo Revit\1.3\Samples\en-US




Credit to John Pierson and Dynamo Forum: https://forum.dynamobim.com/t/can-i-start-dynamo-with-a-template-instead-of-a-blank/15002/4

## CONTENT – FILE NAMING

Don't Overthink it – Keep it simple

Make it easy to search and read the file names

Have standard names that are easy to remember

Dynamo naming logic

Category:

Project Setup - PS
Health Check - HC
Compliance Standards - CS
Life Safety - LS
Modeling - MD
Annotation - AN
Player Script Append - PLY

Description:

HC-Warning-Review
LS-Room-Occupancy-PLY
LS-Room-Occupancy

Name everything consistently for easy review by users

## CONTENT - SCRIPTS

What kind of scripts you need for your company
Figure out the use case then create the scripts

Developer

Design

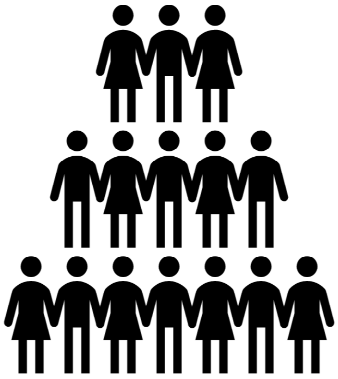
Construction

Analysis

Take suggestions from internal teams about solutions they need

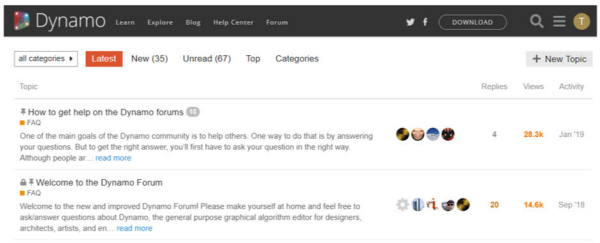
## CONTENT – INTERNAL SOURCE

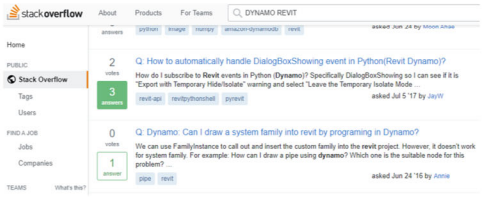
Sourcing content should always be vetted and adjusted for your company standards
Get scripts from your project teams

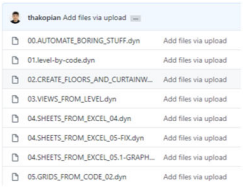


## CONTENT – EXTERNAL SOURCE

Sourcing content should always be vetted and adjusted for your company standards
Online – Dynamo forum , AU , github , stack overflow , youtube








## CONTENT – SCRIPT DIRECTORY

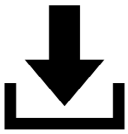
Script library

| Network Folder Directory | Share Point | User Location copy | Dynamo Extension |
|---|---|---|---|
| Easy to access | Easy to access | On the User Computer | Requires further installs to use |
| May be restricted depending on company | Version control Built in | No Version control just updates through a central source or downloads to local machines | DynaHub (requires Github) |
| Limited controls | | | |

## CONTENT - PACKAGES

Two options when it comes to packages.
Either keep it OOTB (out of the box) for your content or use external packages

| OOTB | External |
| --- | --- |
| Dynamo Nodes | Third Party Packages |
| Revit Nodes | Third Party View Extensions |
| From Dynamo team, updated regularly as part of the core product | From independent developers who update on their own schedule |



## CONTENT - PACKAGES

Vetted Packages:

- archi-lab.net
- Bang!
- bimorphNodes
- BumbleBee
- Clockwork
- Data-Shapes
- LunchBox
- Monocle
- Orchid
- Rhythm
- spring nodes
- SteamNodes

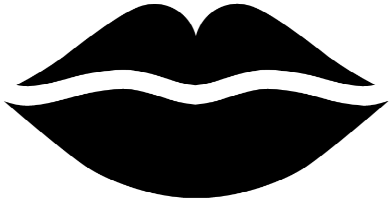
But wait, there's more!
Dynamo has an entire package manager website to see all files available:

https://dynamopackages.com/

Carl Storms and John Pierson have an AU presentation on different packages to use:

https://www.autodesk.com/autodesk-university/class/Dynamo-Packages-Have-You-Tried-These-Yet-2018#presentation

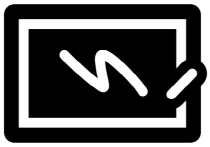
## TRAINING



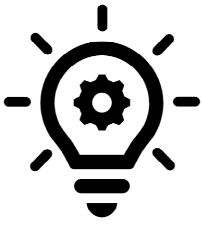
KISS principal for training – Keep It Simple Stupid

## TRAINING

Teach fundamentals and reinforce their learning



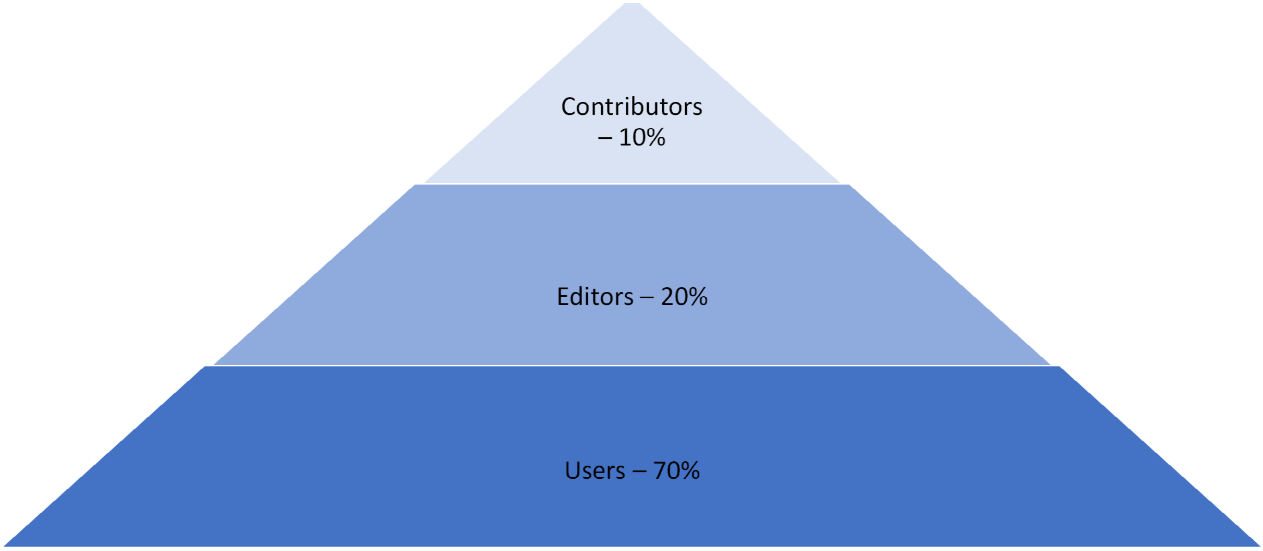
Create lessons on problem solving and working with confidence



Train everyone to become contributors to your Dynamo content

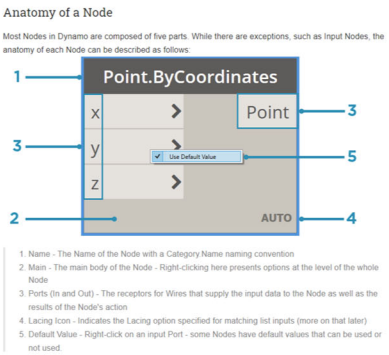
## TRAINING – TIMELINE

Near term training and time requirements
Long term training and preparing your office
Overall training expectations for X% of people to become capable of dynamo access

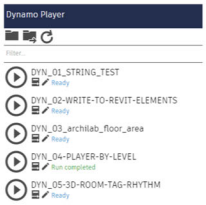



## TRAINING - BASICS

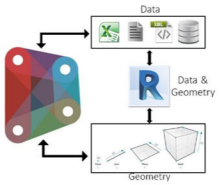
Basics of Dynamo UI




Basics of Dynamo Player




Creating your own scripts



## TRAINING - OUTLINE

Training outline
Use the Dynamo Primer – covers everything

https://primer.dynamobim.org/en/index.html

Sample Training outline:

What is Visual Programming
What is Dynamo
Launching Dynamo
Dynamo UI
Visual Script parts
Using Nodes
Connecting Nodes
Finding Noes
Data Flow
Data Types
Geometry
Curve
Solids
Lists
Managing Lists
Modifying content in Revit
Reading from Revit
Edit your Revit model
Customization
Documentation

## TRAINING – FORMATS AND RESOURCES

Workshops – Sessions that get together a small group of people to review the training in detail

Lunch webinars – Hour long calls to show the broader company what is going on with the product launch and how people can benefit from it

Skill cards – One page documents going over essentials steps for using a software

External coursework – Learning from providers like LinkedinLearning, Autodesk University or another content provider

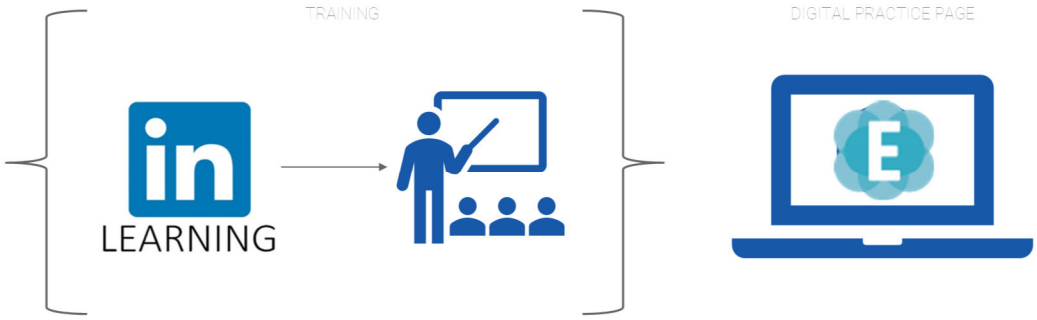
Company coursework - Internally made courses that go into detail the company requirements for using a given product with certification of completion

## TRAINING – HMC INTERNAL TRAINING COURSES

You can create an internal system for training to match your company needs

HMC uses linkedin learning for fundamentals in Dynamo followed by Custom course work to finish the education

That along with ProNow for education tracking we can mark who has completed a course and is ready to apply their skills to a team project




## DEPLOYMENT - 3RD PARTY SOLUTIONS

Get some help from tools available by developers
Some are open source and other are a license subscription
They may be just what you need to bring your deployment together

PyRevit

Can launch Dynamo graphs from one of its many tools

Added Bonus: Make your own tools!

Orkestra

Software to manage Dynamo scripts and packages from the cloud and organize local environments per administrator's requirements

https://www.orkestra.online/

Imaginit Clarity

Automates Revit actions and can launch Dynamo scripts across multiple projects

https://www.imaginit.com/software/imaginit-utilities-other-products/clarity

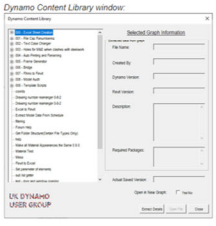
DynaStandard

Dynamo Package to help manage other package deployments and company wide settings

https://github.com/brencas/DynaStandard_public

pyRevit blog

rkestra by d|s

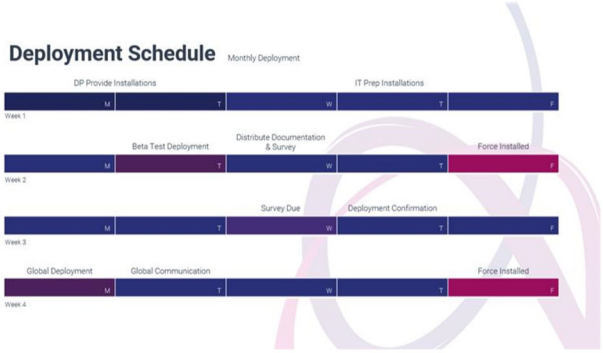


## LAUNCH - COMMUNICATE

- Announce the software release ahead of time
- Company posts – Intranet, Emails, External Social media
- Webinars – Hour long calls to promote the tools and take questions
- Communicate benefits to managers and leadership to see the light
- Build interest because people rarely use this stuff

## LAUNCH - SCHEDULE

- Don't do it all at once!
- Create a deployment schedule
- Use a beta tester group and get survey responses from them on how the install went
- Start from one office or group and release the installs in a timeframe
- Install the deployments on all user machines
- Uninstall the old versions of Dynamo
- Install the designated 2X versions
- Install External Packages



## POST LAUNCH

Feedback on Installation and improvements to be made

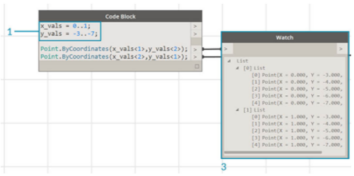
Get classes started

Monthly releases

## LONG TERM PLANNING

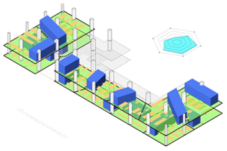
Beginning the next step in your roadmap in computational design

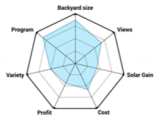
Advanced Dynamo




Software integration

Generative Design





## LONG TERM PLANNING

Dedicated personnel for the studios to have staff for using CD tools

User groups to support collaboration and further learning

Internal Projects for Computational Design

## LESSON LEARNED

- It's OK if something is messy, just get started and refine the process
- Dynamo is a software to make tools so it's a different process from install of other software
- Ask for help from co-workers and external professionals
- Let your Leadership know what you are doing and explain the value
- Don't rush it – slow is smooth, smooth is fast
- It's an ever changing environment so get used to modifying your plans
- Reach out to Dynamo team for questions about specifics

## REFERENCES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