

NAPOLEON DYNAMO

ESTABLISHING COMPUTATION AND COMPUTATIONAL CULTURE IN YOUR COMPANY



BURO HAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

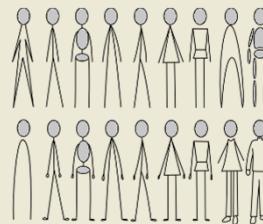


KAYLEIGH HOUDE
COMPUTATIONAL COMMUNITY LEADER
BUROHAPPOLD ENGINEERING

BUROHAPPOLD
ENGINEERING



**CREATION OF NEW
SCRIPTS +
ORGANIZATION OF
REPOSITORIES**



**RUNNING IN-
PERSON HACKS +
TRAINING**



**TRAVELING TO
GLOBAL
OFFICES TO
SPREAD
COMPUTATION**

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

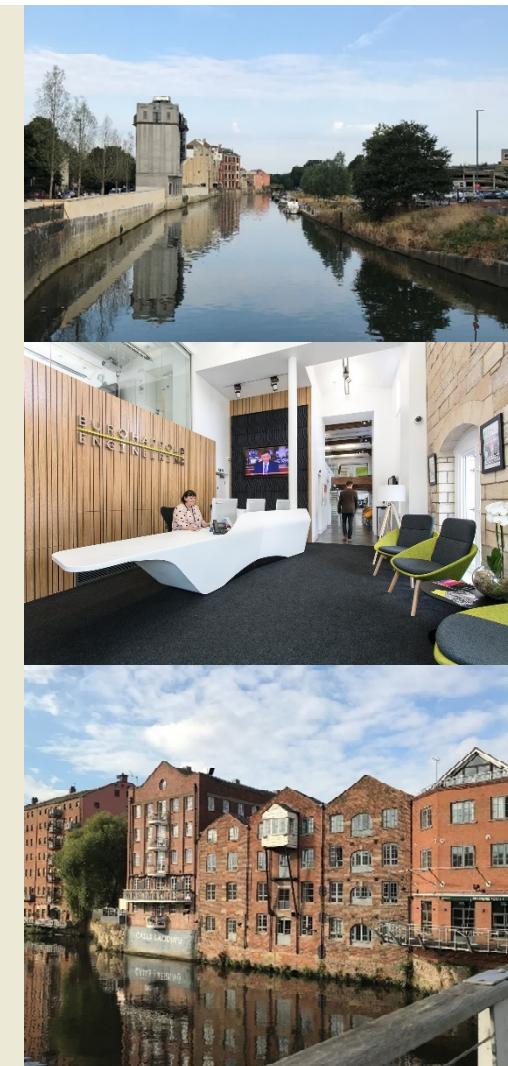


BUROHAPPOLD ENGINEERING



BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED



THE COMPUTATIONAL JOURNEY AT BUROHAPPOLD

2007

*Started
Implementing Revit*

2014

*90% of Projects in
Revit*

2014

*Dynamo
Introduced*

2018

*Automation on
50% of Projects*



CODE

```
1  using BH.Engineering;
2
3  namespace BH.Engineering
4  {
5      public class Person
6      {
7          /*****  
8          /**/  
9          /****/  
10         public string Name { get; set; }  
11
12         public string Discipline { get; set; }  
13
14         public string Team { get; set; }  
15
16         public string Grade { get; set; }  
17
18         public string Email { get; set; }  
19
20         public string Photo { get; set; }  
21
22         public string UserLogin { get; set; }  
23
24         public string AdminLogin { get; set; }  
25
26         public Skeleton Skeleton { get; set; }  
27
28         public string codeDevelopmentRole { get; set; }  
29
30     }
```



COMMUNITY



PROJECTS



COURSE OVERVIEW

PART I: DEVELOPING A DYNAMO TRAINING STRATEGY

PART II: ESTABLISHING COMPUTATIONAL CULTURE

PART III: CREATING SCRIPTS YOU'LL USE

PART IV: MAKING IT PROJECT SPECIFIC



PART I

DEVELOPING A TRAINING STRATEGY

BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED



BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

LEARN IT YOURSELF

BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED



WHY SHOULD I LEARN DYNAMO?

- 1) IT'LL FREE UP YOUR TIME FOR THE THINGS YOU WANT TO BE DOING (SKETCHING, DOING CALCULATIONS)**
- 2) IT'S A NATURAL TRANSITION FROM THE REVIT WORLD**
- 3) LEARNING TO ADAPT MAKES YOU RESILIENT TO CHANGE**
- 4) IT'S FUN**

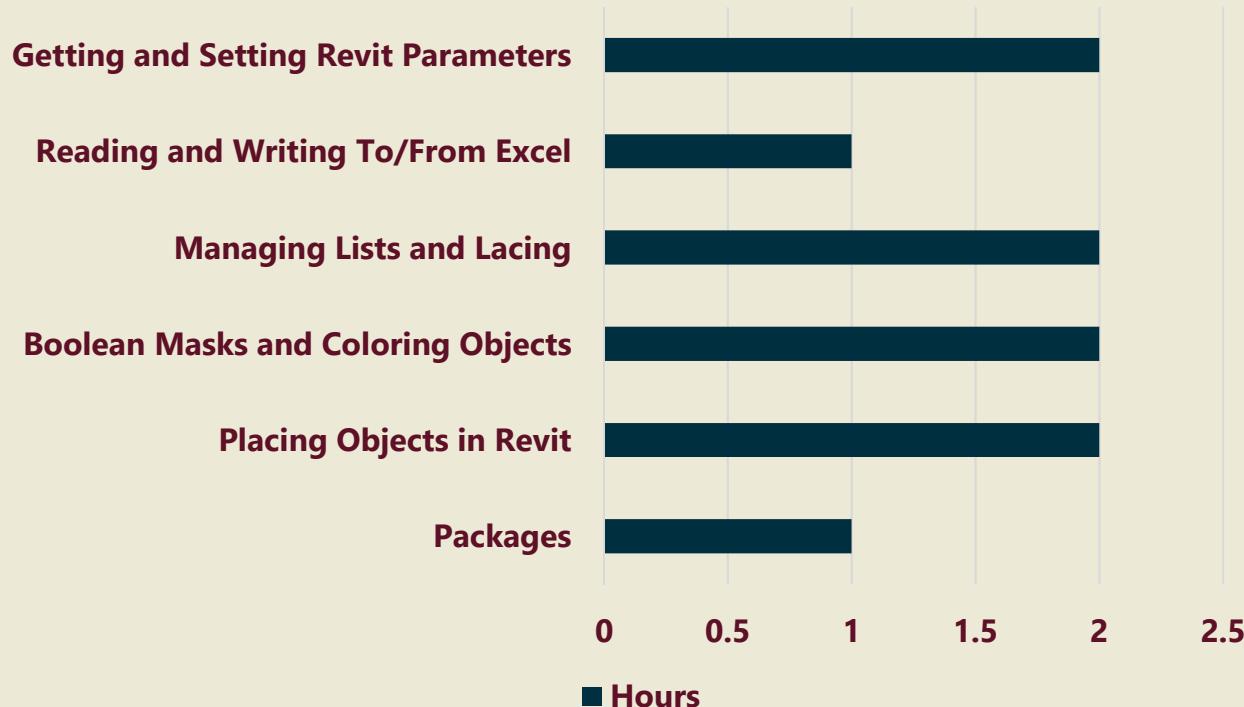
WAYS TO SELF-LEARN

- **USE THE DYNAMO PRIMER**
- **GOOGLE YOUR PROBLEMS**
- **GO TO A LIVE DYNAMO LAB AT AUTODESK UNIVERSITY**
- **USE THE HANDOUTS FROM PREVIOUS AU LABS:**

<http://au.autodesk.com/au-online/classes-on-demand/class-catalog/classes/year-2017/revit/msf123198-1>

WHAT'S MY INVESTMENT GOING TO BE?

10 Hours of Training Investment



GREAT! YOU SELF-LEARNED DYNAMO



HOW DO YOU
BRING EVERYONE
ELSE ALONG ON
YOUR JOURNEY?

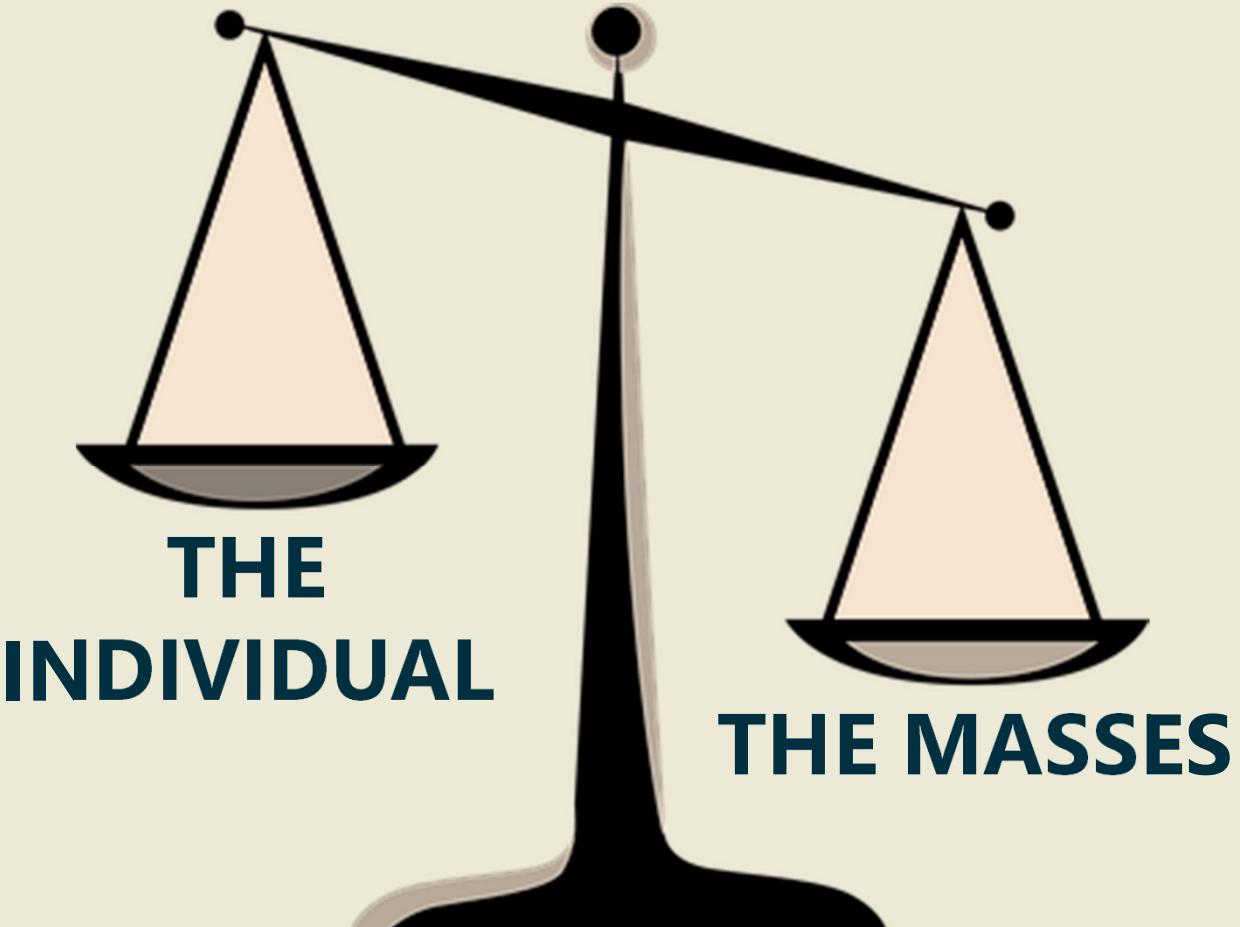


BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

WHAT SHOULD I KNOW BEFORE I ROLL THIS OUT COMPANY-WIDE?

- 1) IT HAS TO BE INTENTIONAL, BUT KNOW THAT IT WILL BE PAINFUL (AT FIRST)**
- 2) YOU CAN'T WAIT FOR IT TO BE PERFECT**
- 3) IT'LL SAVE YOU TIME, TIME=MONEY**
- 4) IT'S GOING TO CREATE UNEXPECTED COMMUNITIES**
- 5) IT'S REALLY EMPOWERING (ESPECIALLY FOR YOUNGER STAFF)**



BURO HAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

TRAINING THE MASSES

BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED



MASS TACTIC #1:

HANDS-ON

TRAINING

PROGRAM

BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED



A TRAINING PROGRAM FOR THE MASSES

- **GOAL: TO LEARN ALL NECESSARY DYNAMO FUNCTIONS**
- **A LAB STYLE ATMOSPHERE**
 - **GIVEN A CHALLENGE**
 - **WORKING ON PROBLEM SOLVING**
 - **WALK AWAY WITH A SOLUTION FOR FUTURE USE**

PRE-REQUISITES FOR BETTER ABSORPTION

- **STRONG BACKGROUND IN REVIT**
- **UNDERSTANDING OF REVIT'S PROGRAMMATIC ORGANIZATION:**
 - **PARAMETERS (TYPE, INSTANCE)**
 - **ELEMENT ID**
 - **CATEGORIES**

DYNAMO LABS

ONE HOUR IN LENGTH

DYNAMO TRAINING LAB | PART III

BUROHAPPOLD ENGINEERING

THE PROBLEM

Set the flow for each diffuser in a space, as an equitable portion of the Specified Supply Airflow defined for the space. (If a space contains 4 diffusers and is supposed to be 1000 CFM overall, each diffuser will be set to 250 CFM.)

STEP 1 Open Revit 2017 > Go to the Manage Tab > Open-Dynamo

STEP 2 Collect the flow parameter for all air terminals in your model

STEP 3 Determine which diffusers are in which spaces

STEP 4 Determine how many diffusers are in each space

STEP 5 Gather the Specified Supply Airflow parameter from each space

STEP 6 Divide the Specified Supply Airflow among the number of diffusers in each space

STEP 7 Set the flow parameter for each diffuser based on this value

CHALLENGE

DYNAMO TRAINING LAB | PART III

BUROHAPPOLD ENGINEERING

SOLUTION

The screenshot shows a complex Dynamo script titled "Dynamo Training Part 3". The script uses various nodes to process data from Revit, including "Input Selected Category", "Get Family Name", "Count", "Cross Product", "Divide", "Get the Selected Parameter Value", and "Set the Value". A 3D view of a building model is visible at the bottom, showing a grid of diffusers. A detailed callout box explains the logic: "Input Selected Category" filters by "Family Name: Diffuser". "Get Family Name" extracts the family name. "Count" counts the number of diffusers. "Cross Product" creates a list of all diffusers. "Divide" divides the total specified supply airflow by the number of diffusers. "Get the Selected Parameter Value" retrieves the airflow parameter for each diffuser. "Set the Value" applies the calculated airflow to each diffuser.

SOLUTION

DYNAMO TRAINING LAB | PART III

BUROHAPPOLD ENGINEERING

TIMEFRAME
1 Hour Training Session Graduate +

THE NODE LIBRARY

This screenshot displays the "Node Library" section of the Dynamo interface. It includes three examples: 1) "FamilyInstance_Space" node with a callout explaining it allows pinpointing the space that a family instance lives in. 2) "Equal" node with a callout explaining it determines whether two OBJECT instances are equal. 3) "CountTrue" node with a callout explaining it tells how many trues you received in the "Equal" node. A large "APPLICATION" section shows a complex network of nodes for calculating airflow, with arrows pointing to specific nodes like "Longest" and "Shortest" with their respective descriptions.

NODE LIBRARY

**BUROHAPPOLD
ENGINEERING**

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

THE CHALLENGES

DYNAMO TRAINING LAB | PART I

BUROHAPPOLD
ENGINEERING

THE PROBLEM

STEP 1 Open Revit 2017 > Go to the Manage Tab > Open Dynamo

STEP 2 Create a script that takes all of the spaces within your model and creates a "Specified Supply Airflow" in M3/Hr.

HINT Dynamo Units are Seconds rather than feet



FUNDAMENTALS

DYNAMO TRAINING LAB | PART II

BUROHAPPOLD
ENGINEERING

THE PROBLEM

STEP 1 Open Revit 2017 > Go to the Manage Tab > Open Dynamo

STEP 2 Create a script that sets the DFM for each zone to 1000 CFM/Hr.

HINT You'll need to get the Area of the assigned zones

Dynamo Units are Seconds rather than feet



WRITING TO EXCEL

DYNAMO TRAINING LAB | PART III

BUROHAPPOLD
ENGINEERING

THE PROBLEM

Set the flow for each diffuser in a space, as an available portion of the Specified Supply Airflow defined by the space. If a space contains 4 diffusers and is required to be 1000 CFM overall each diffuser will be 250 CFM.

STEP 1 Open Revit 2017 > Go to the Manage Tab > Open Dynamo

STEP 2 Collect the flow parameter for all air terminals

STEP 3 Determine which diffusers are in which spaces

STEP 4 Determine the max diffusers are in each space

STEP 5 Get the Specified Supply Airflow

STEP 6 Divide the Specified Supply Airflow among the number of diffusers in each space

STEP 7 Set the flow parameter for each diffuser based on this value



MANIPULATING
REVIT PARAMETERS

DYNAMO TRAINING LAB | PART IV

BUROHAPPOLD
ENGINEERING

THE PROBLEM

Observe the colors of your diffusers in the model, based on CFM range. Diffusers under 300 CFM are orange, diffusers over 300 CFM are red.

STEP 1 Open Revit 2017 > Go to the Manage Tab > Open Dynamo

STEP 2 Collect the flow parameter for all air terminals

STEP 3 Determine which diffusers are over 300 CFM and which are under

STEP 4 Color the diffusers over 300 CFM green

STEP 5 Color the diffusers under 300 CFM red

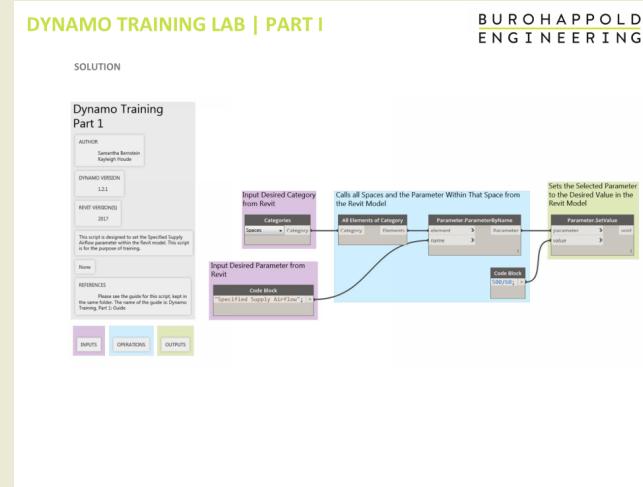


COLORING FOR QA

LAB 1 | CHALLENGE

FUNDAMENTALS

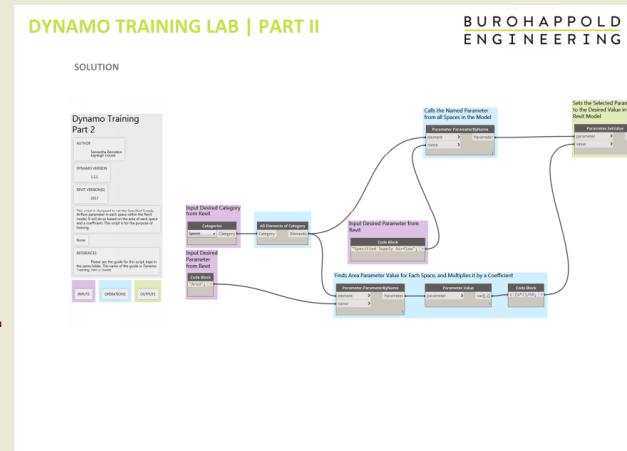
1. OPEN REVIT + DYNAMO
2. COLLECT ALL OF THE SPACES WITHIN YOUR MODEL
3. COLLECT THE "AREA" PARAMETER FROM THE SPACES WITHIN YOUR MODEL
4. SET EACH SPACE'S "SPECIFIED SUPPLY AIRFLOW" PARAMETER TO 2 CFM/SF



LAB 2 | CHALLENGE

WRITING TO EXCEL

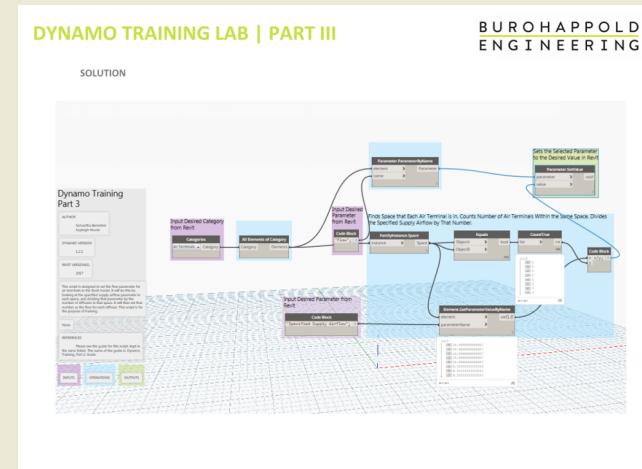
1. OPEN REVIT + DYNAMO
2. COLLECT ALL OF THE SPACES WITHIN YOUR MODEL
3. COLLECT THE "SPECIFIED SUPPLY AIRFLOW" AND "NAME" PARAMETERS FROM THE SPACES WITHIN YOUR MODEL
4. WRITE THE SPACE'S NAME AND THE SPECIFIED SUPPLY AIRFLOW PARAMETERS TO EXCEL



LAB 3 | CHALLENGE

REVIT PARAMETER MANIPULATION

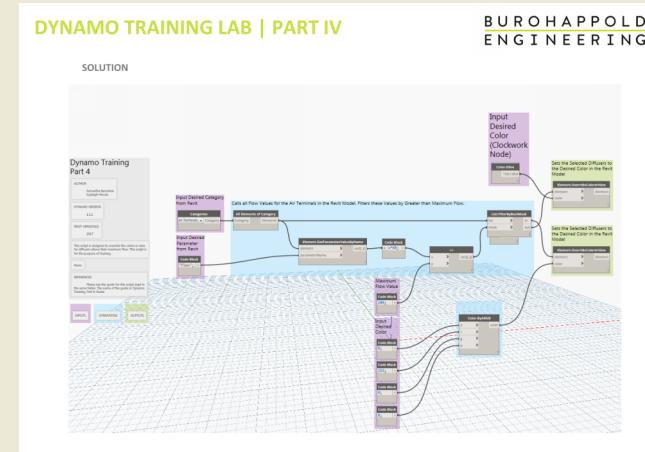
1. OPEN REVIT + DYNAMO
2. COLLECT ALL OF THE AIR TERMINALS IN YOUR MODEL + THEIR "FLOW" PARAMETER
3. COLLECT THE SPACES FROM YOUR MODEL + THEIR "SPECIFIED SUPPLY AIRFLOW" PARAMETER
4. DETERMINE WHICH AIR TERMINALS ARE IN WHICH SPACES
5. DIVIDE THE SPACE "SPECIFIED SUPPLY AIRFLOW" BY THE NUMBER OF AIR TERMINALS IN THE SPACE
6. SET THE FLOW PARAMETER FOR EACH AIR TERMINAL TO THAT AMOUNT



LAB 4 | CHALLENGE

COLORING OBJECTS (QA)

1. OPEN REVIT + DYNAMO
2. COLLECT ALL OF THE AIR TERMINALS IN YOUR MODEL + THEIR “FLOW” PARAMETER
3. DETERMINE WHICH AIR TERMINALS ARE UNDER AND OVER 200 CFM
4. COLOR THE DIFFUSERS OVER 200, RED
5. COLOR THE DIFFUSERS BETWEEN 100 AND 200, GREEN
6. COLOR THE DIFFUSERS UNDER 100, YELLOW



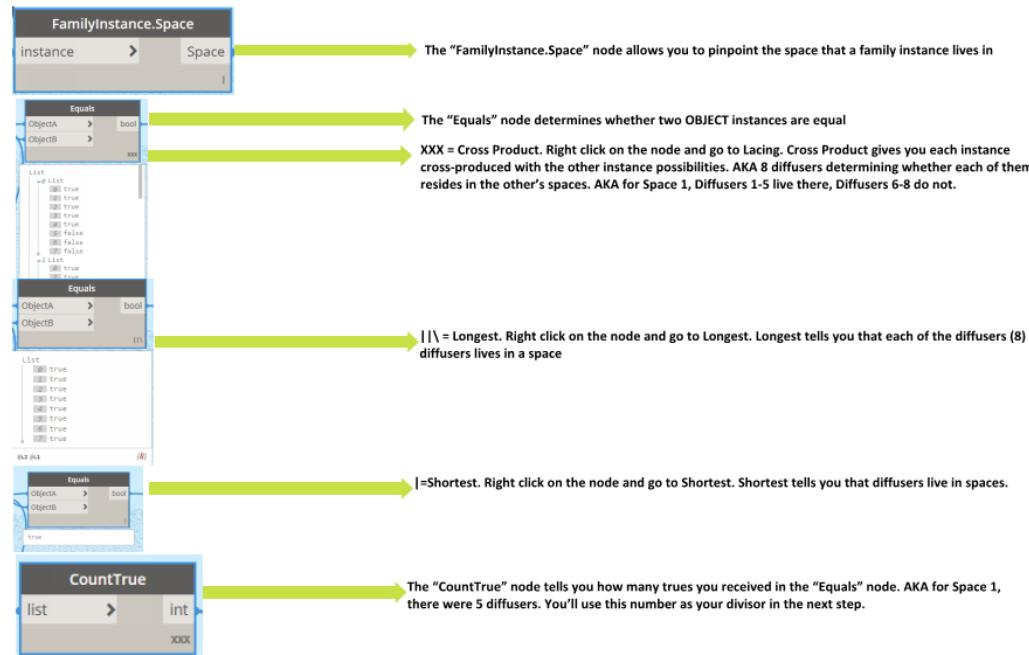
THE NODE LIBRARY

DYNAMO TRAINING LAB | PART III

TIMEFRAME
1 Hour Training Session Graduate +

THE NODE LIBRARY

APPLICATION



BUROHAPPOLD
ENGINEERING

BUROHAPPOLD
ENGINEERING

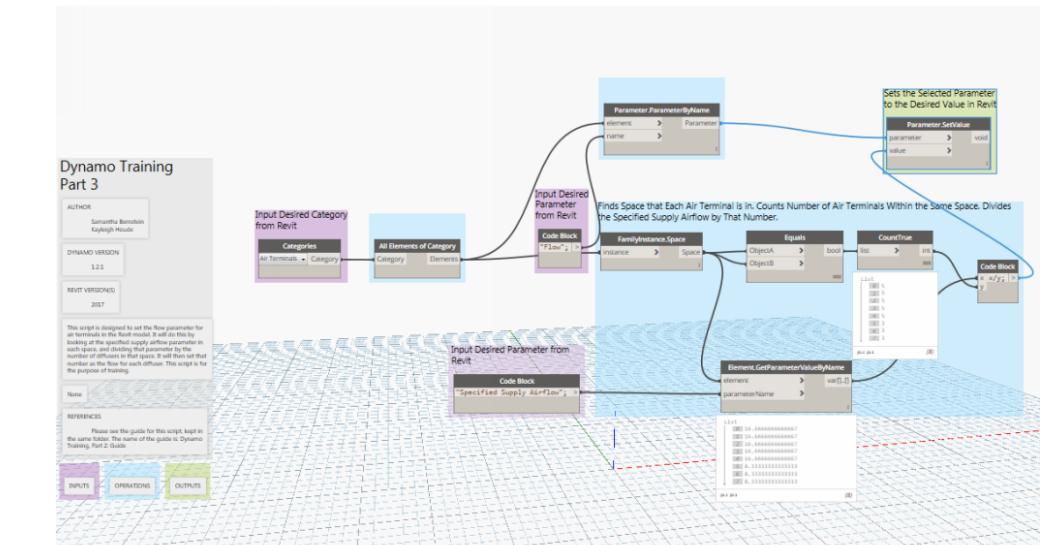
COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

THE SOLUTION

DYNAMO TRAINING LAB | PART III

BUROHAPPOLD
ENGINEERING

SOLUTION



BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

SCRIPTING HYGIENE

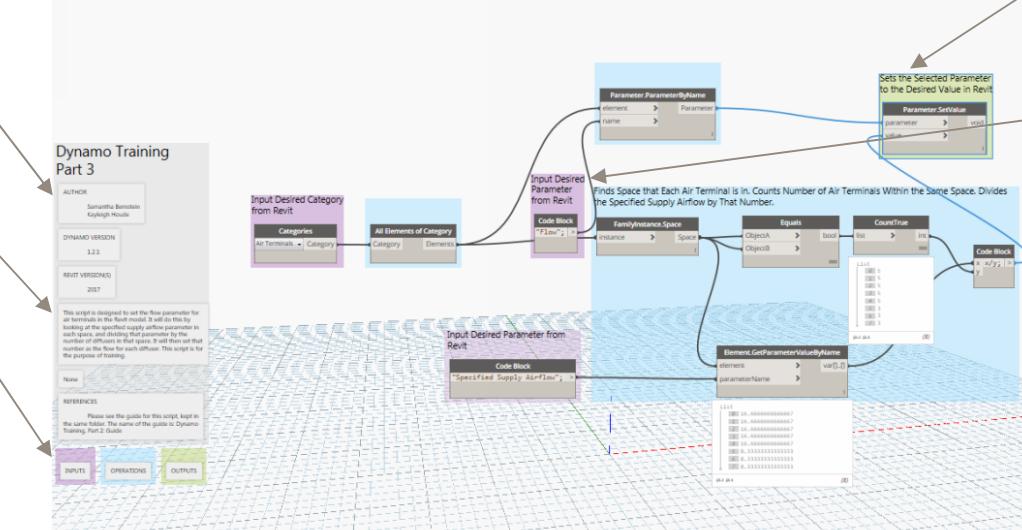
AUTHOR(S)

EXPLANATION
(DEPENDENT
PACKAGES ETC)

EXPLANATION
OF COLOR SCHEME

DYNAMO TRAINING LAB | PART III

SOLUTION



OUTPUTS/
SOLUTION
(GREEN)

INPUTS
(PURPLE)

PROCESSES
(BLUE)

BURO HAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

MASS TACTIC #2:

RELAYING

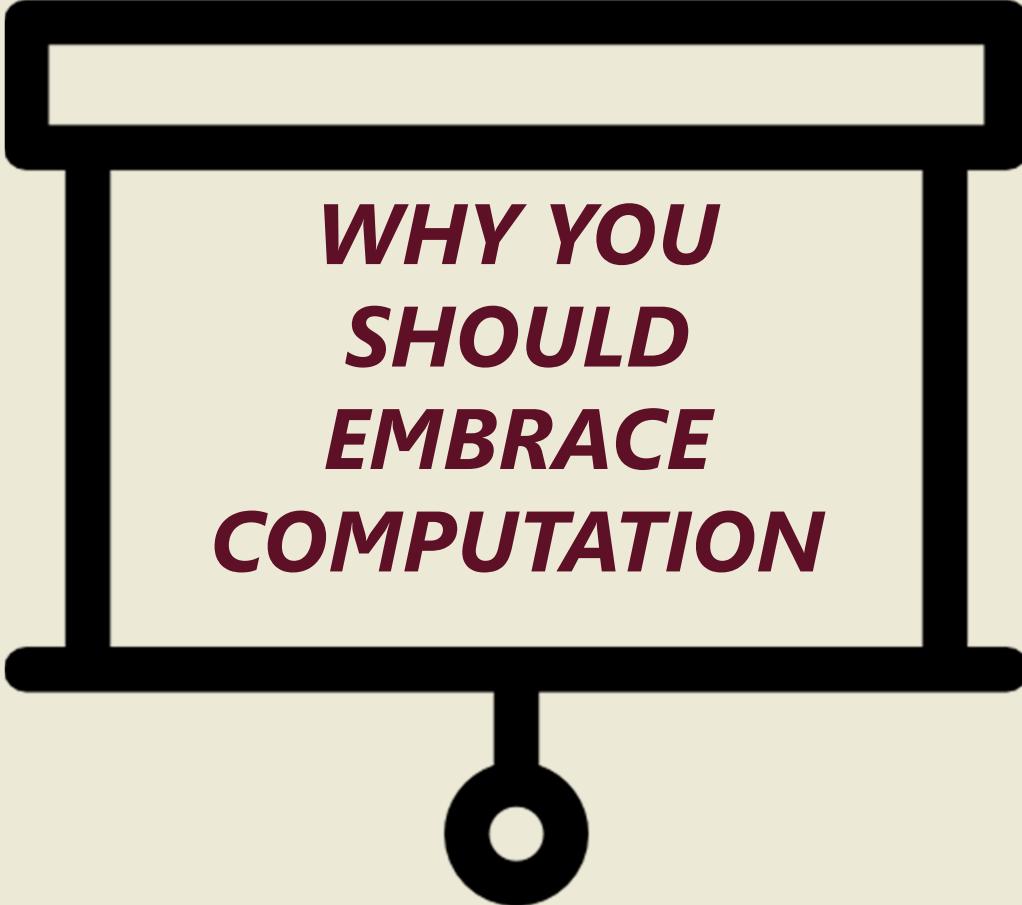
INFORMATION

**BUROHAPPOLD
ENGINEERING**

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED



A PRESENTATION FOR THE MASSES



***WHY YOU
SHOULD
EMBRACE
COMPUTATION***

BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

VIDEOS

BETTER, FASTER
MECHANICAL DESIGN
USING DYNAMO

BUROHAPPOLD
ENGINEERING

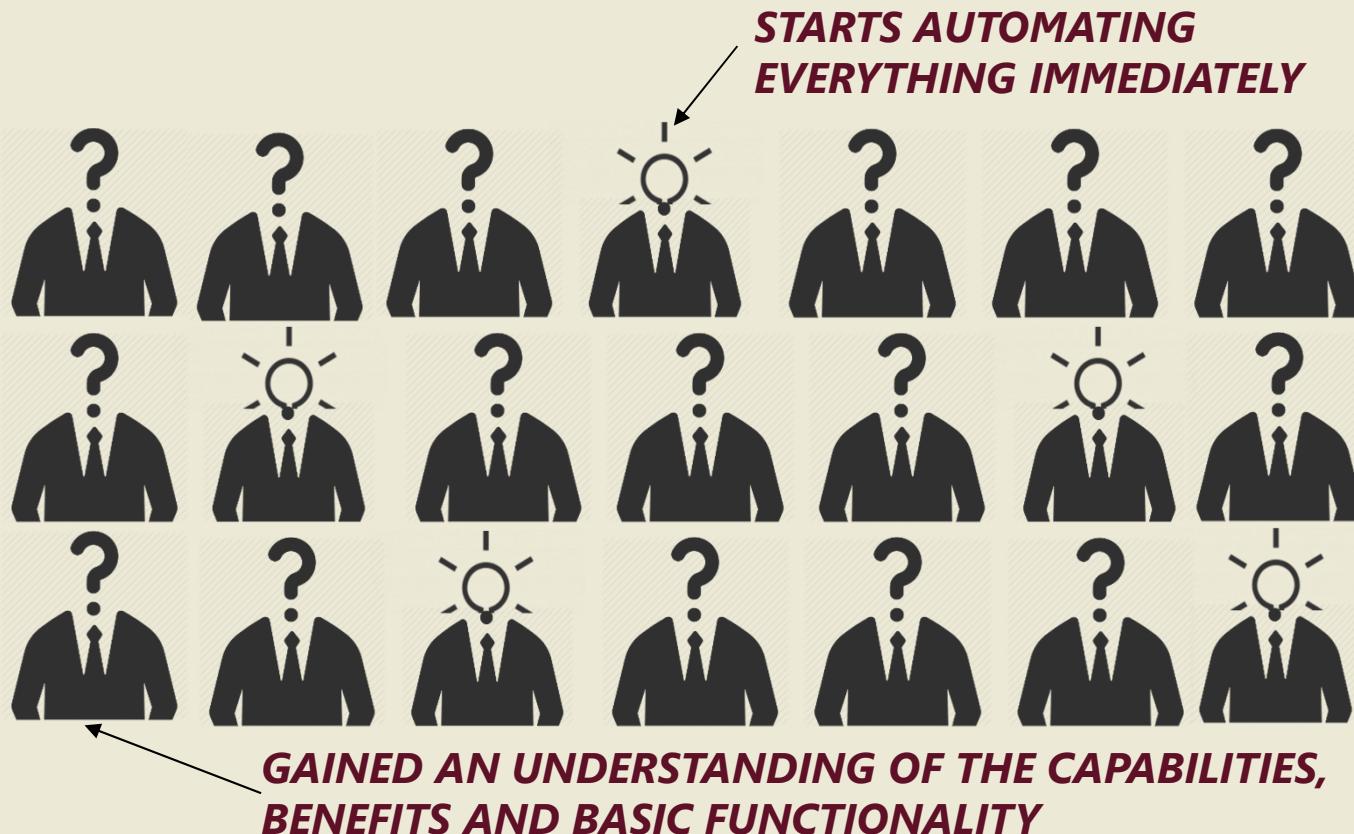
BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

THE PROS OF TRAINING THE MASSES

- 1) A SAFE, HANDS-ON ENVIRONMENT FOR BASIC INTRODUCTION TO THE SOFTWARE**
- 2) LEARNING THE CAPABILITIES OF THE SOFTWARE AS A WHOLE**
- 3) CUTS THE TIME OF TRYING TO SELF-LEARN**

THE DRAWBACK OF TRAINING THE MASSES



TRAINING INDIVIDUALS

BURO HAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED



TRAIN SMALL GROUPS OF PEOPLE WHO WILL HAVE SIMILAR “LIGHTBULB” MOMENTS

**BUROHAPPOLD
ENGINEERING**



Global Lighting Hack

- 1) Pull Light Fixtures from your Model
- 2) Pull Spaces from your Model
- 3) Determine the Lights per Space
- 4) Get the Wattage of your Lights
- 5) Get the Area of your Spaces
- 6) Determine Watts/Area
- 7) Set Watts/Area as a Space Parameter
- 8) Color Spaces by their Watts/Area (Red=Too High, Green=Correct, Yellow=Too Low)



**BUROHAPPOLD
ENGINEERING**

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

PREDICTABLE LIGHTBULB MOMENTS

AUTOMATIC
PLACEMENT



GRADUATE
ENGINEER

EASIER QA/QC



BIM
MANAGER

PULLING DATA OUT
OF THE MODEL



PROJECT
MANAGER

DOCUMENTED ROI
FROM SCRIPTING



YOUR
BOSS

TURNING THOSE LIGHTBULBS ON

**AUTOMATICALLY
PLACING RISER
TAGS**



**GRADUATE
ENGINEER**

**STREAMLINING ALL
TEXT (CAPITALIZE,
FONT, SIZE)**



**BIM
MANAGER**

**AUTOMATED
MATERIAL TAKE
OFFS**



**PROJECT
MANAGER**

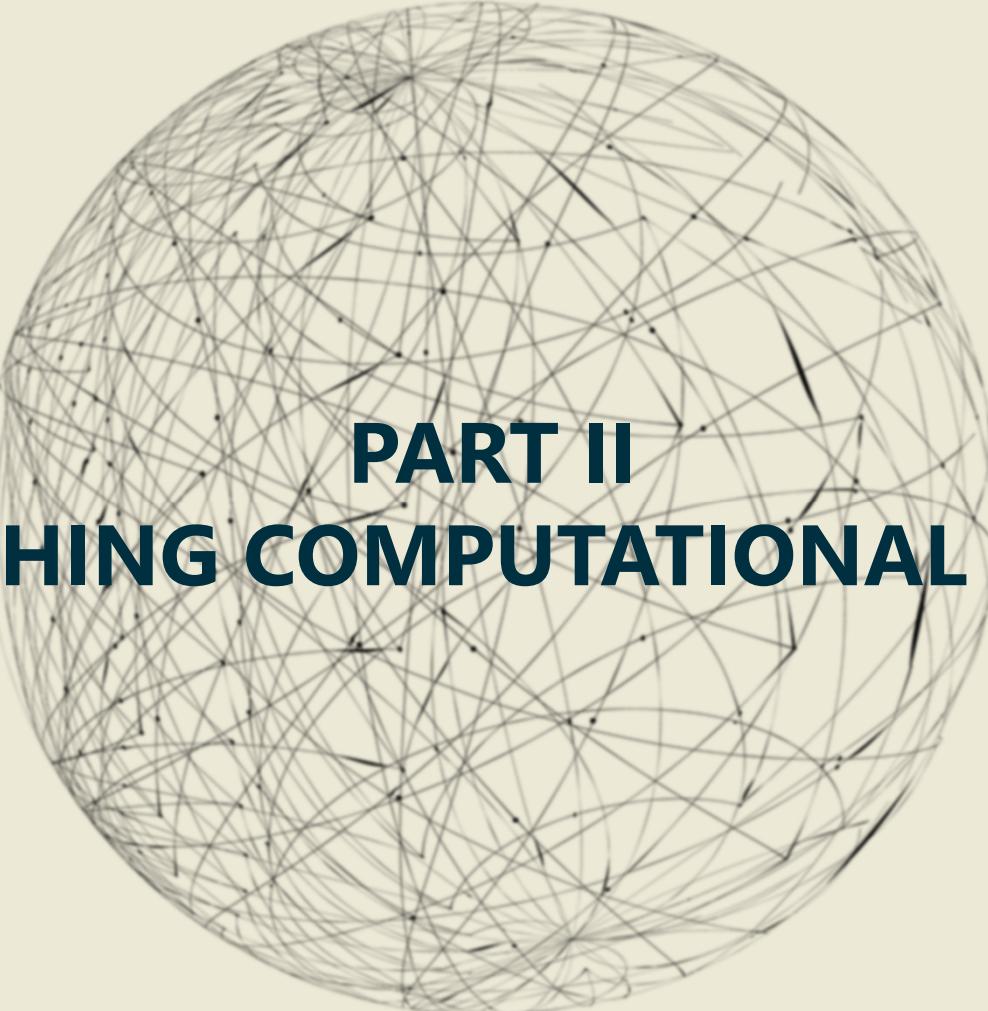
**TRACK TIME
SAVINGS PER
SCRIPT**



**YOUR
BOSS**

**BUROHAPPOLD
ENGINEERING**

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED



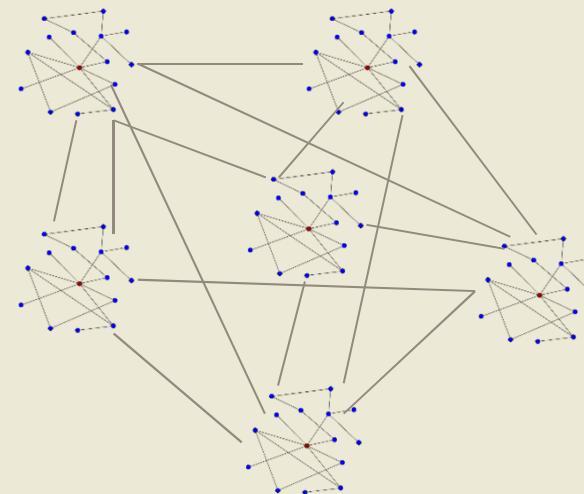
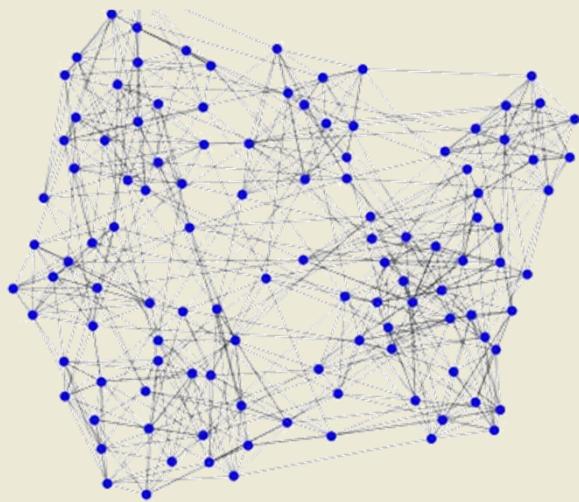
PART II

ESTABLISHING COMPUTATIONAL CULTURE

BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

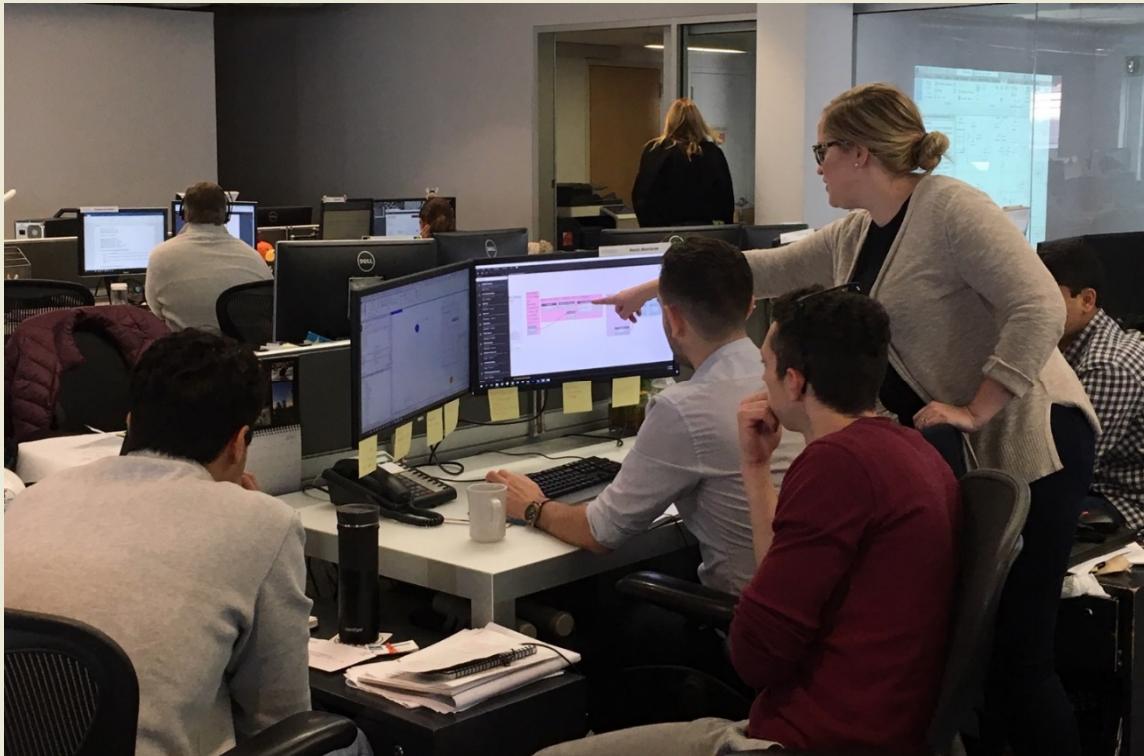
NETWORKS VS. COMMUNITIES



HOW TO GROW YOUR COMPUTATIONAL COMMUNITY

- **GET PEOPLE TOGETHER (HACK NIGHTS/WEBINARS)**
- **ORGANIZED/OPEN ACCESS TO KNOWLEDGE**
- **REGULAR COMMUNICATION (SKYPE CALLS/HACKS)**
- **TRAIN “THE TOP” (DISPLAY ROI)**
- **CELEBRATE YOUR SUCCESSES**

ADVANTAGES OF HAVING A SMALL TEAM

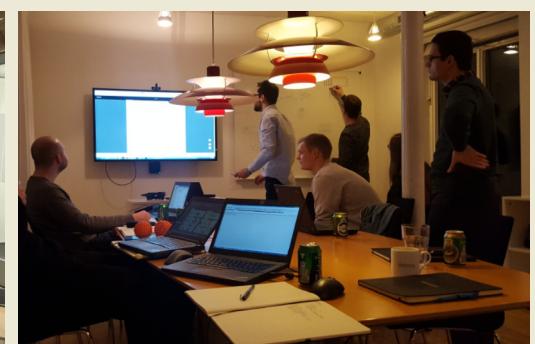
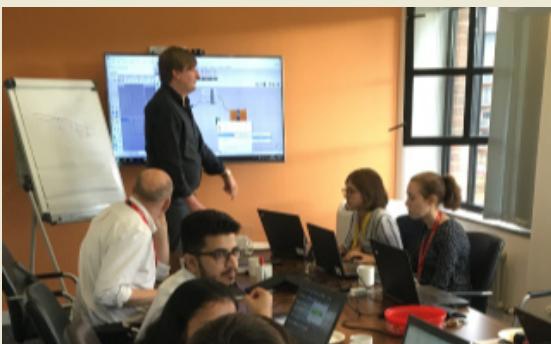


BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

THE COMPUTATIONAL COLLECTIVE

HACK NIGHTS



BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

DO THE MATH

75 PEOPLE



1 HOUR OVER LUNCH
1x PER MONTH

1 SCRIPT EACH



2 HOURS SAVED PER
SCRIPT, APPLIED ON 5
PROJECTS PER YEAR

750
HOURS
SAVED
(PER YEAR)

BUT IF THEY TRUSTED EACH OTHER'S SCRIPTS...

75 PEOPLE



10 SCRIPTS PER
DISCIPLINE



APPLYING THEIR
DISCIPLINE'S SCRIPTS ON
PROJECTS

2 HOURS SAVED PER
SCRIPT, APPLIED ON 5
PROJECTS PER YEAR

7500
HOURS
SAVED
(PER YEAR)

BUT IF SCRIPT USAGE WAS COMPANY-WIDE (AND ORGANIZED)...

- **PEOPLE WOULD FEEL MORE IMPELLED TO USE THE PROPER SCRIPTS**
- **YOU'D KNOW EXACTLY WHICH SCRIPTS YOU SHOULD BE USING**
- **YOU'D KNOW HOW SCRIPTS PLAYED INTO YOUR DISCIPLINE'S WORKFLOW**

SHARE YOUR SCRIPTS SHAREPOINT

Script Library						
Image	Name	Script Type	Contact	Status	Description	Discipline
	00000_Getting Started		Kayleigh Houde		This folder contains previously used TRAINING MATERIAL for Dynamo, Grasshopper and BHoM.	Global
	00001_Revit Space Generator	Dynamo	Kayleigh Houde	Alpha	This script allows you to place Spaces in your Model based on the (linked model) Architect's Rooms. It has the added functionality of allowing you to adjust the "Room Names" as you see fit adding in Name, Number, Level etc.	MEP - General
	00002_Fire Damper Placement	Dynamo	Kayleigh Houde	Alpha	The Fire Damper Placement script was created by Samantha Bernstein. It looks for the "Fire Rating" parameter within your Architectural model's walls; finds the intersections of walls and ducts, and places a Fire Smoke Damper at	MEP - Mechanical
	00003_Sprinkler Placement Script	Dynamo	Alistair Mauder	Alpha	The sprinkler placement script pulls the spaces from your model, assesses their geometry and places the code prescribed number (that you input) of sprinklers within each space at a given height (that you input).	Fire Engineering
	00004_VAV Placement Script	Dynamo	Kayleigh Houde	Alpha	The VAV placement script accesses your space's "Specified Supply Airflow" parameter, and places a VAV box family at a specified point within each space. The script also adjusts the "Flow" parameter for the VAV box, if you're	MEP - Mechanical
	00005_Diffuser Placement Script	Dynamo	Kayleigh Houde	Alpha	The Diffuser Placement script reads your space "Specified Supply Airflow" and places the appropriate number of diffusers (this one is based on linear grilles) in the space. It currently takes the "Specified Supply Airflow" and	MEP - Mechanical
	00006_Ventilation Calculation Script	Dynamo	Kayleigh Houde	Alpha	The ventilation calculation script reads from the table of Revit "Space Types" that could be applied to your spaces, references ASHRAE guidelines for Outside Air Required per Space,	MEP - Mechanical

**BURO HAPPOLD
ENGINEERING**

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

SHARE YOUR SCRIPTING IDEAS

TRELLO

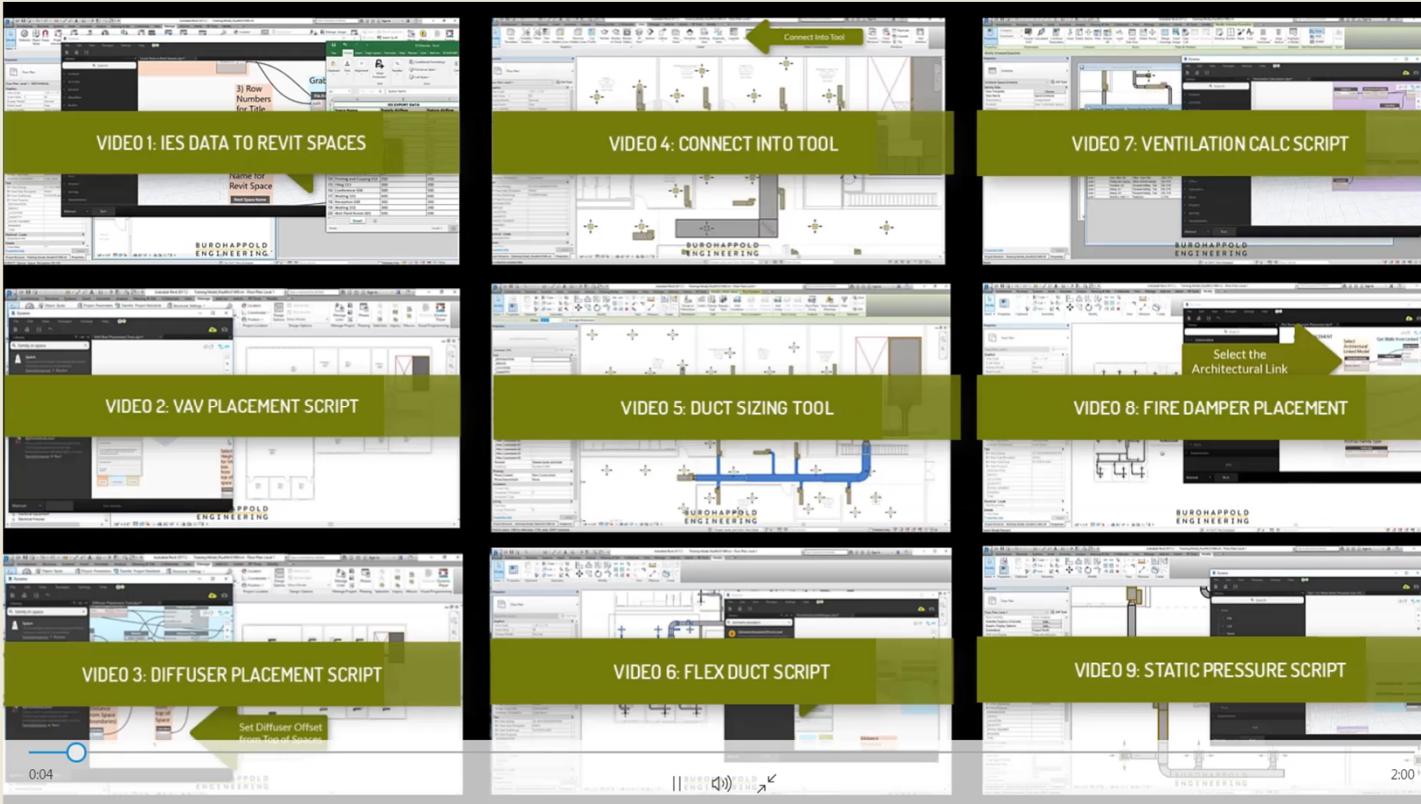
The Trello board is organized into four main columns:

- Wishlist:**
 - 3D to 2D Schematic Riser (using Grasshopper with Rob May, dissimilar from Adroit click association method)
 - Automated Conduit/Duct/Pipe Routing
 - Revit Model Purge Tool
 - Standard Notes Dynamo Drop Down
 - Complex Framing Cost Optimizer
 - Geometry Export for energy modeling
 - Roof stormwater tool
- In Progress:**
 - Duct Static Pressure Calculation (Accessories)
 - Equivalent Length Script (Tie in to Hydraulic Calculation Script)
 - Plate Girder Designer for RAM
 - Revit RAM Interoperability
 - Intake / Exhaust Proximity Check
 - Access Panel Placement
- To Be Approved / Placed on Sharepoint:**
 - BOD/Schematic Design Criteria Table
 - BUROHAPPOLD ENGINEERING**
Pipe Pressure Loss Guide | Revit
This guide details the process for completing a pipe pressure loss calculation in Revit.
Calculation Review
Manage > MEP Settings > Mechanical Settings > Pipe Settings > Calculation
This panel details the use of the Simplified Colebrook Equation and the Darcy Weisbach Equation
 - Pipe Pressure Loss Calculation
 - Multiple View Creation + View Template Add Script
- Completed and Distributed:**
 - Switch Placement (Different types)
 - BUROHAPPOLD ENGINEERING**
Stair Pressurization Calculation Script
 - Pipe Pressure Loss Calculation
 - Multiple View Creation + View Template Add Script
 - Smoke Purge Calculation Script
 - Detail Sheet Creation Script

BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

DOCUMENTING DISCIPLINE-PROJECT WORKFLOWS WITH DYNAMO



BURO HAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

SHOUT ABOUT YOUR SCRIPTS

Computational Collective

Tom Ben-David – October 24 at 8:53 AM

I made a complementary script to the riser tagging tagging script that was presented in last week's Hakinar:
A vertical tag aligner script!
The attached screenshot of the script aligns selected pipes of a certain type vertically between two selected points, such as elbows at a certain distance from their respective tags.

I made a short video showing how this script can be used with the riser tagging script to very quickly place and align DW and HHW risers in a residential plan.

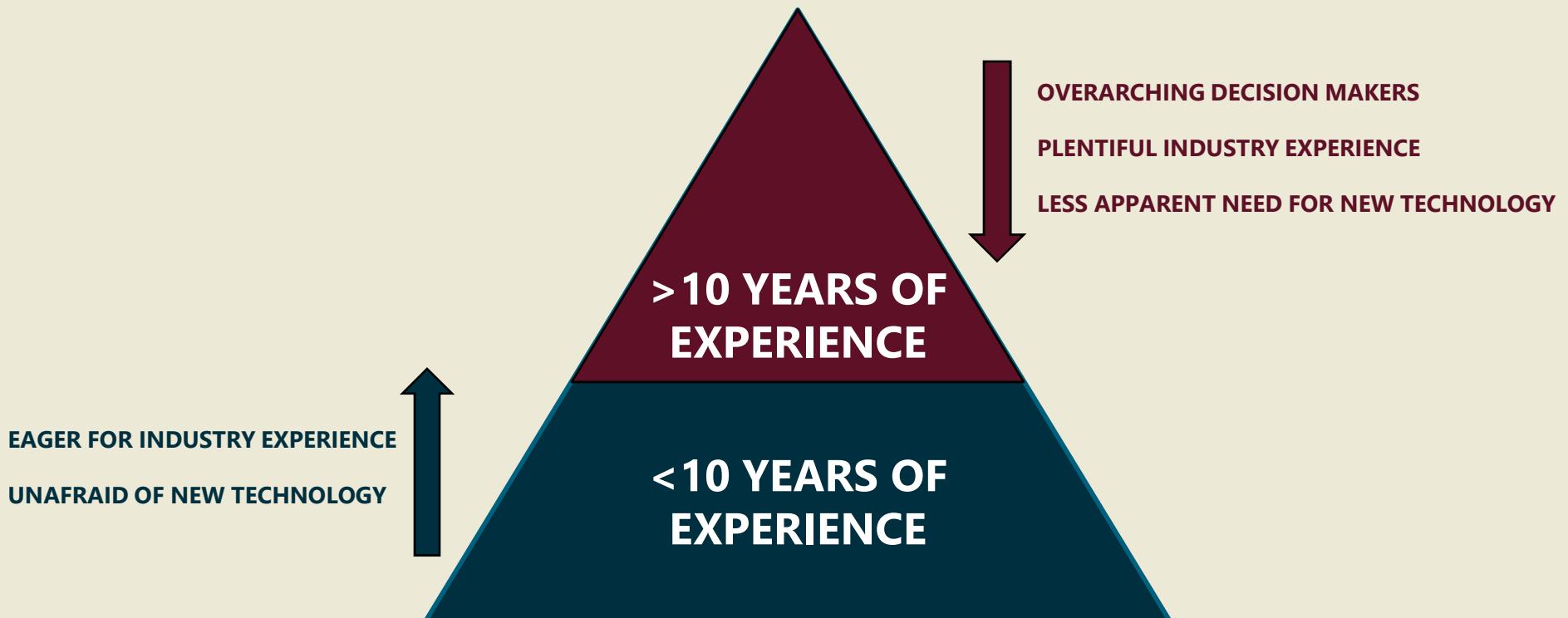
cc: Kayleigh Houde, Paul Hickey, and Samanta Wein



ROAD BLOCKS

- 1) INDUSTRY EXPERIENCE /= SCRIPTING EXPERIENCE**
- 2) MONETARY DECISION MAKERS /= SCRIPT MAKERS**
- 3) PEOPLE ARE RELUCTANT TO LEARN NEW SKILLS**
- 4) RISK VS REWARD ON TRIED AND TRUE VS SCRIPTING**

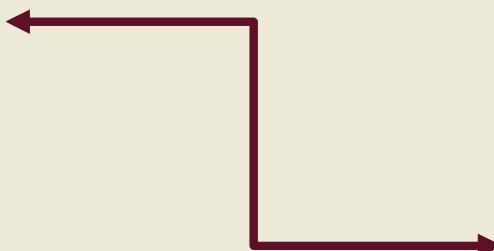
DIVISION OF SKILL



THE GAP



PATRICK
PRINCIPAL ENGINEER
25 YEARS OF EXPERIENCE
RESIDENT EXPERT OF MEP DESIGN



SAMMY
ENGINEER
25 YEARS OLD
RESIDENT EXPERT OF DYNAMO

BRIDGING THE GAP

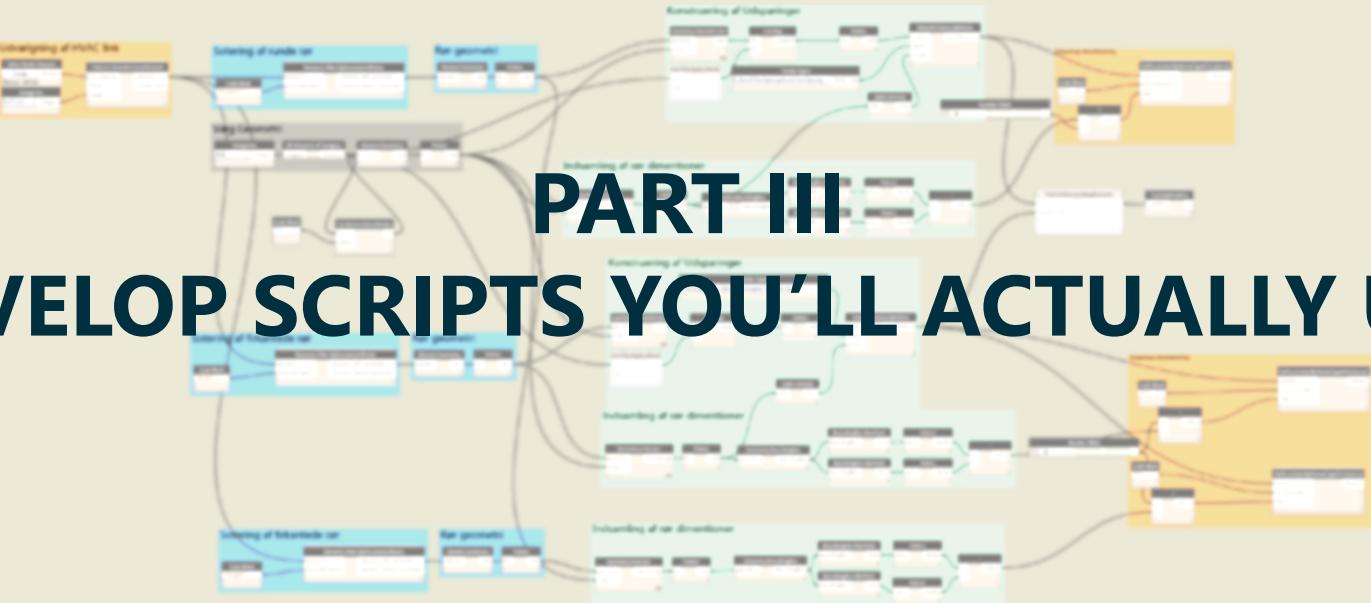


HAS THE ABILITY TO CRITIQUE THE
SCRIPTS THAT ARE CREATED AND
ADD VALUE THROUGH PLENTIFUL
INDUSTRY EXPERIENCE

DYNAMO
CONNECTS THE
PRINCIPALS
WHO CARE
WITH THE
SCRIPTERS
WHO CARE



HAS THE ABILITY TO
DISPLAY USE CASES
(VIDEOS OF SCRIPTS, ROI
ON PROJECTS)



PART III

DEVELOP SCRIPTS YOU'LL ACTUALLY USE

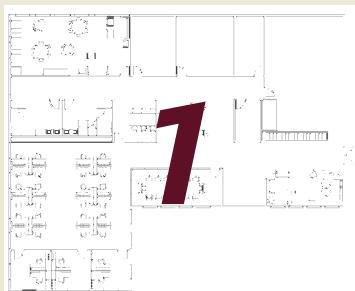
BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

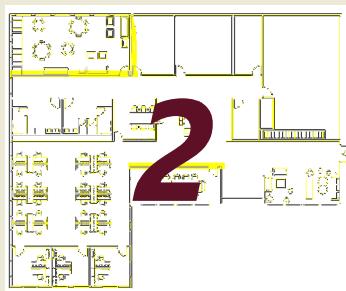
WHAT SHOULD YOU BE BUILDING SCRIPTS FOR?

- **ANYTHING MONOTONOUS/REPETITIVE IN REVIT**
- **QA PROCEDURES**
- **AUTOMATIC PLACEMENT BASED ON RULES**

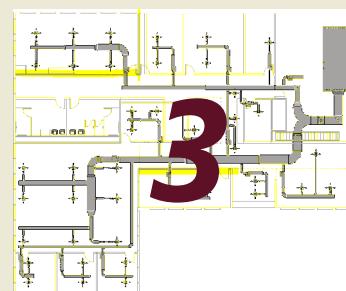
EXAMPLE: FIRE DAMPER PLACEMENT TRADITIONAL PROCESS



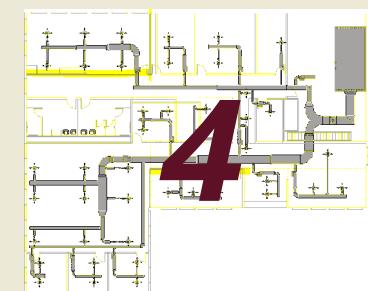
1
*LOOK AT LIFE SAFETY
PLANS*



2
*MARK FIRE RATED
WALLS IN YOUR
REVIT PLAN*

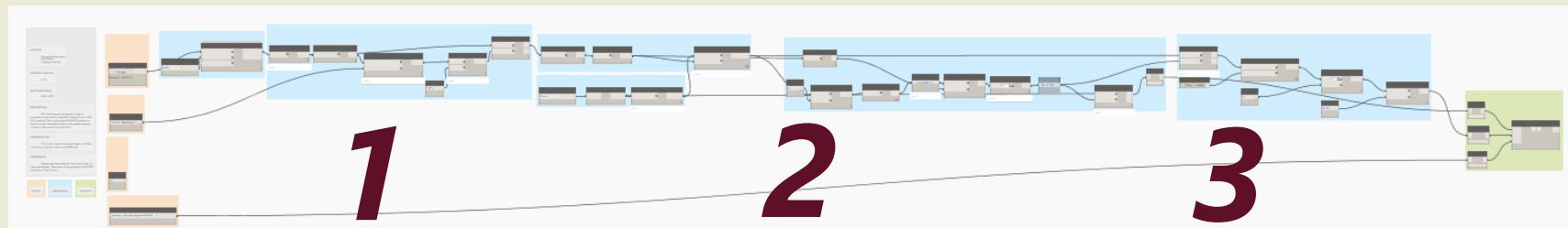


3
*FIND ALL
DUCTWORK THAT
PENETRATES THOSE
WALLS*



4
*PLACE A FIRE
DAMPER IN THAT
DUCTWORK
MANUALLY*

EXAMPLE: FIRE DAMPER PLACEMENT WITH DYNAMO



**SELECT
ARCHITECTURAL
LINKED MODEL**

**FIND THE FIRE
RATING PARAMETER
IN THE WALLS**

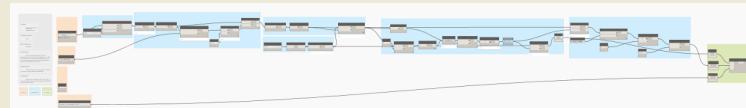
**SELECT THE FIRE
DAMPER FAMILY
YOU'D LIKE TO
PLACE**

WHO HAD INPUT?

SAMMY
DYNAMO EXPERT
MECHANICAL ENGINEER



BUILDING THE SCRIPT ITSELF



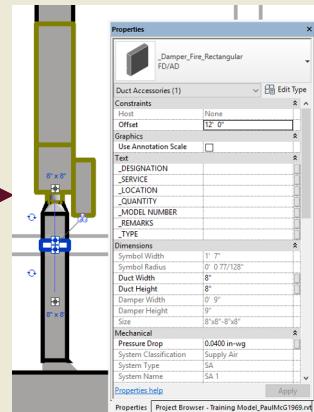
TOM
DYNAMO EXPERT
MECHANICAL GRADUATE



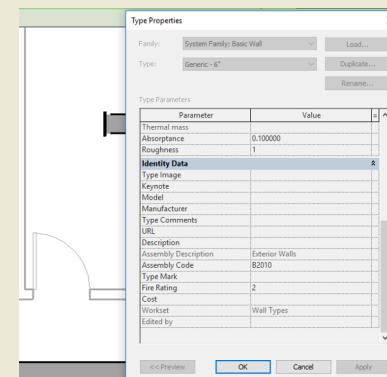
PAUL
BIM MANAGER



ENSURE THE PROPER
OUTPUT IN REVIT



ENSURE THE ARCHITECT
INTENTIONALLY PLACED
THE FIRE RATING
PARAMETER



CHRIS
PROJECT LEADER



BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

PRO TIPS ON SCRIPT BUILDING

- **DON'T CREATE OVERLY-COMPLICATED SCRIPTS**
- **GENERIC ENOUGH FOR MULTIPLE-PROJECT-USAGES**
- **CLEARLY DENOTE INPUTS (GOOD SCRIPT HYGIENE)**
- **CREATE SCRIPTS THAT IT WON'T TAKE AN EXPERT TO FIX**



**IF YOU WAIT FOR SCRIPTS TO BE PERFECT,
YOU'LL NEVER MOVE FORWARD**

REGIONAL DISCONNECT

RAYMOND
DYNAMO EXPERT



LA DRAWING
STANDARDS

NATHAN
INTERMEDIATE DYNAMO USER



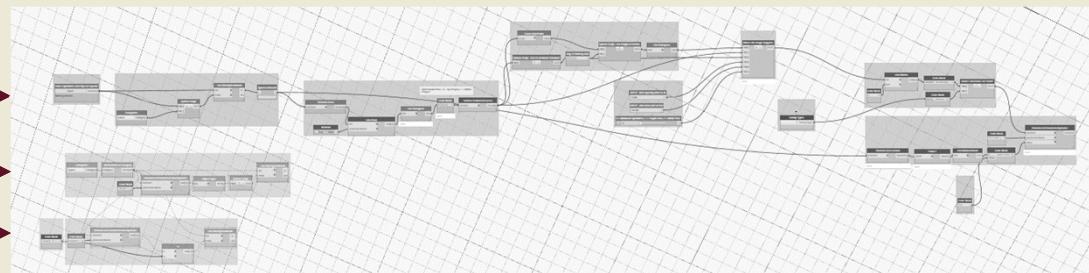
NY DRAWING
STANDARDS

JONATHAN
INTERMEDIATE DYNAMO USER



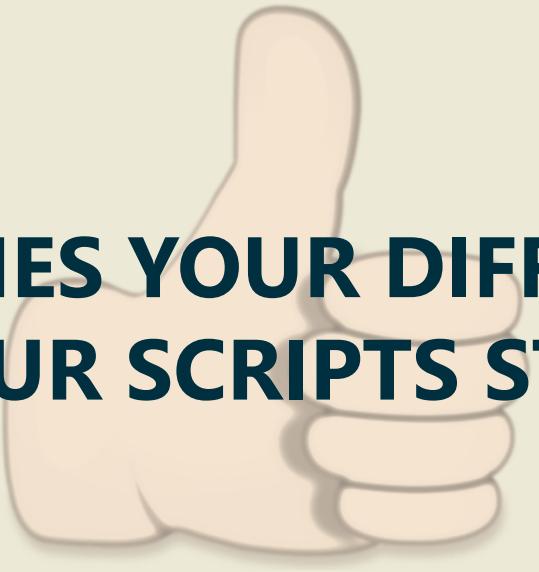
BOSTON
DRAWING
STANDARDS

DISCONNECT PLACEMENT SCRIPT



BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED



**SOMETIMES YOUR DIFFERENCES
MAKE YOUR SCRIPTS STRONGER**

MAKING EVERYONE COMFORTABLE

KAYLEIGH
DYNAMO EXPERT



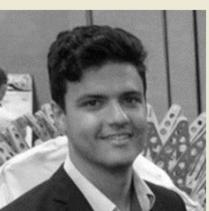
WHOLE BUILDING

KEVIN
INTERMEDIATE DYNAMO USER



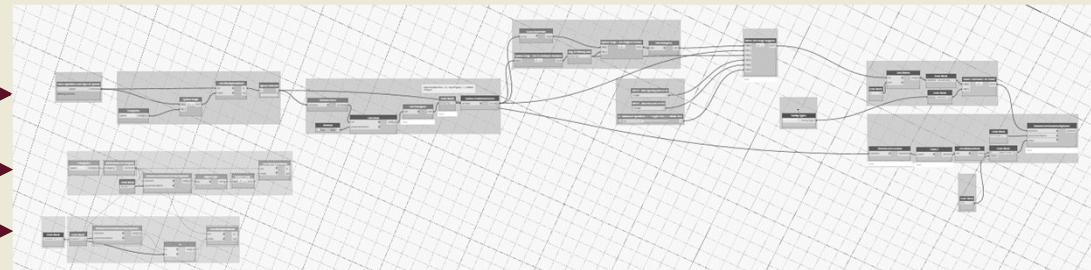
BY LEVEL

KYRIAKOS
NEW TO DYNAMO



BY SPACE

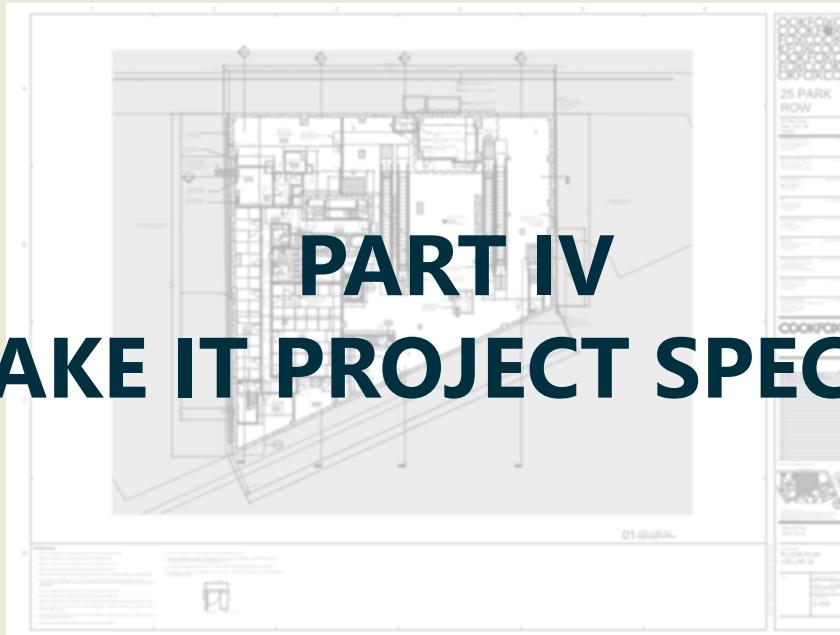
SPRINKLER PLACEMENT SCRIPT



BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

PART IV MAKE IT PROJECT SPECIFIC



BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

COMPUTATION AT EXTERNAL KICK OFFS

CHRIS
PROJECT LEADER



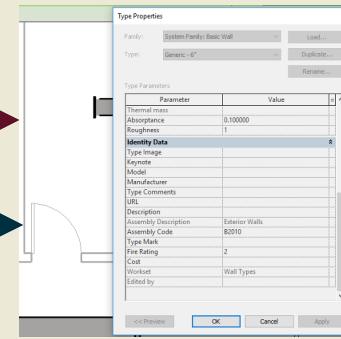
PAUL
BIM MANAGER



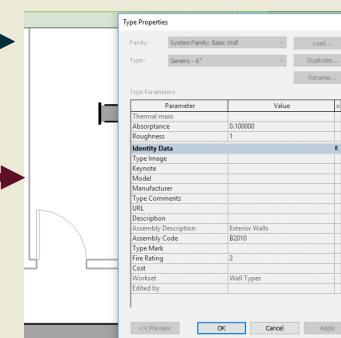
SAMMY
COMPUTATIONAL EXPERT



NECESSITY OF EARLY
ROOM CREATION FOR
SPACE DATA



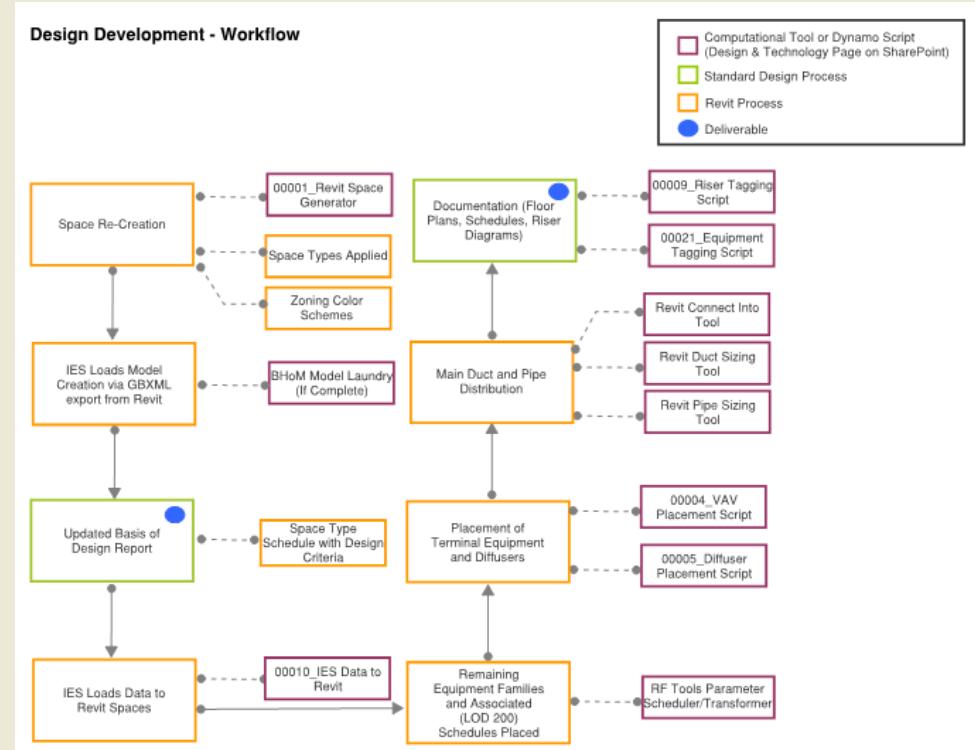
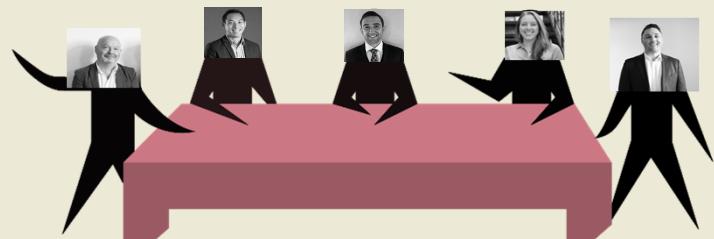
HIGHLIGHT PARAMETERS
FOR INTEGRATION



BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

MAKE A PLAN FOR USING COMPUTATION WITH YOUR TEAM ON DAY 1



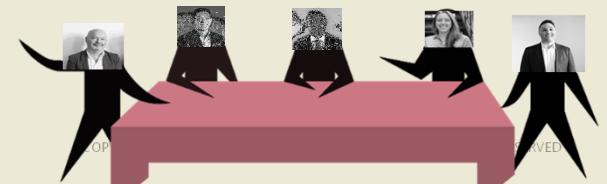
VIABLE CANDIDATES FOR PROJECT AUTOMATION

DATA TRANSLATION (ANALYSIS MODEL DATA GOING INTO REVIT)
NO MORE DOUBLE HANDLING YOUR DATA!

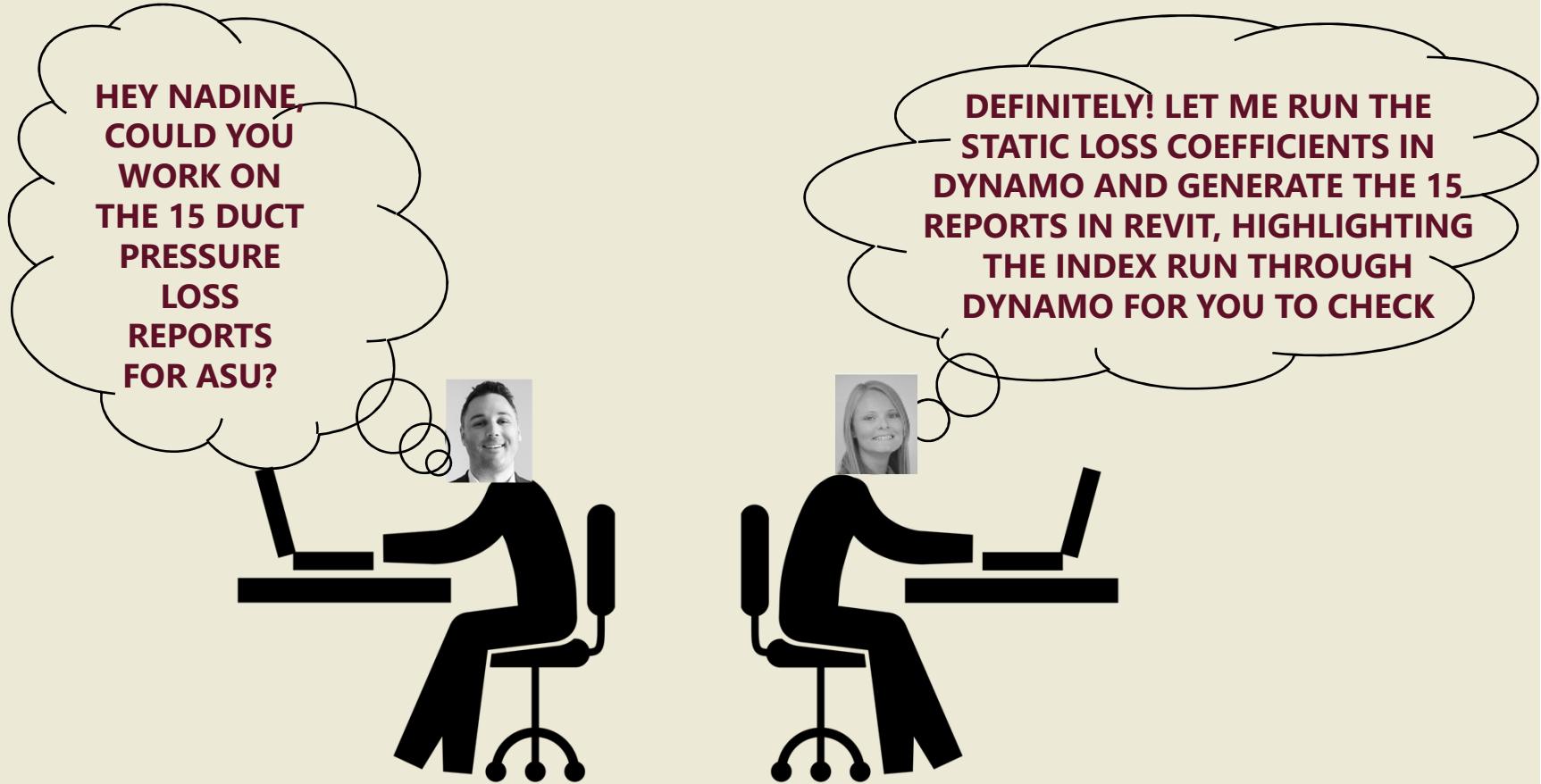
INITIAL OBJECT PLACEMENT BY RULES (RECEPTACLES, SPRINKLERS, DIFFUSERS)

INITIAL SIZING (SPRINKLER PIPING, DUCT SIZING)

ALL ANNOTATION/DOCUMENTATION



COMMIT TO BETTER WAYS OF WORKING



REMEMBER WHY YOU'RE USING COMPUTATION



FINAL THOUGHTS

HOW WILL YOU KNOW IT WORKED?

BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED

SIGNS THAT YOU'VE SUCCEEDED

TOM



***TOM IS THINKING
ABOUT COMPUTATION
WITH ALL TASKS
ASSIGNED***

***TOM IS AN
ACTIVE/CONTRIBUTING
MEMBER OF THE GLOBAL
COMPUTATIONAL
COMMUNITY***

PATRICK



***PATRICK IS
CRITIQUING ALL OF
THE SCRIPTS WE
CREATE***

***PATRICK IS
FINANCIALLY
COMMITING TO
COMPUTATION BY
GIVING COMPUTATION
HOURS ON ALL NEW
PROJECTS***

QUESTIONS?



BUROHAPPOLD
ENGINEERING

COPYRIGHT © 1976-2018 BUROHAPPOLD ENGINEERING. ALL RIGHTS RESERVED