Revit Data Mining for Project Health Insights

Mike Bartyzel & Jose Fandos

UK BIM Lead & BIM Application Specialist

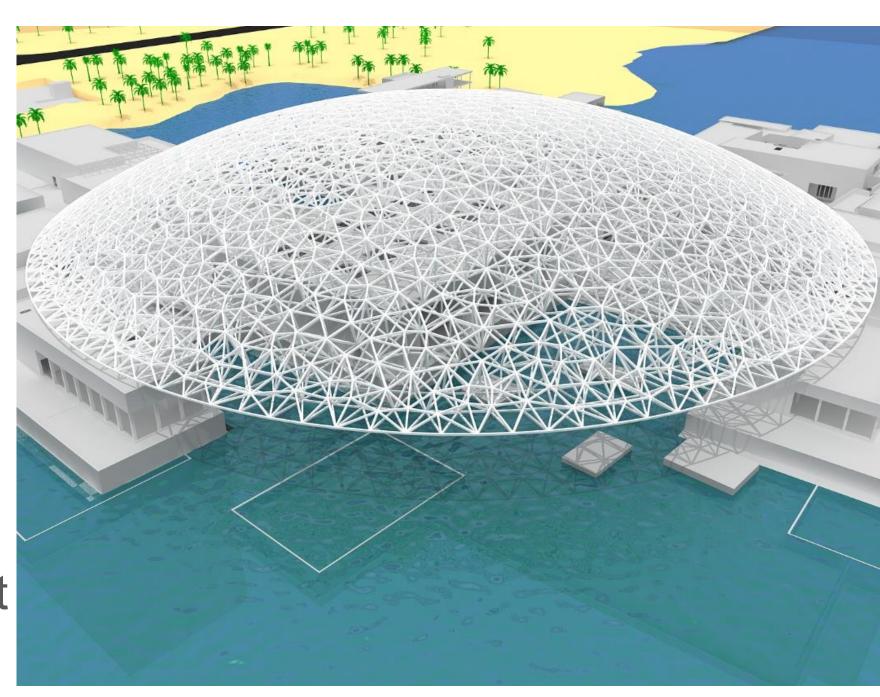Join the conversation #AU2017

AUTODESK
UNIVERSITY

Key Learning Objectives
You will:

- Know what tools are available to help harness the data generated by your teams and projects

- Develop a plan to bring coding talent into your team, foster innovation and convince management

- Troubleshoot projects in minutes

- Get insights into your team's Revit activities and project progression

Mike Bartyzel

- UK BIM Lead BuroHappold Engineering

- CIBSE Digital Engineering Steering Group member

- Society of Digital Engineering

- LRUG (London Revit User Group) organizer

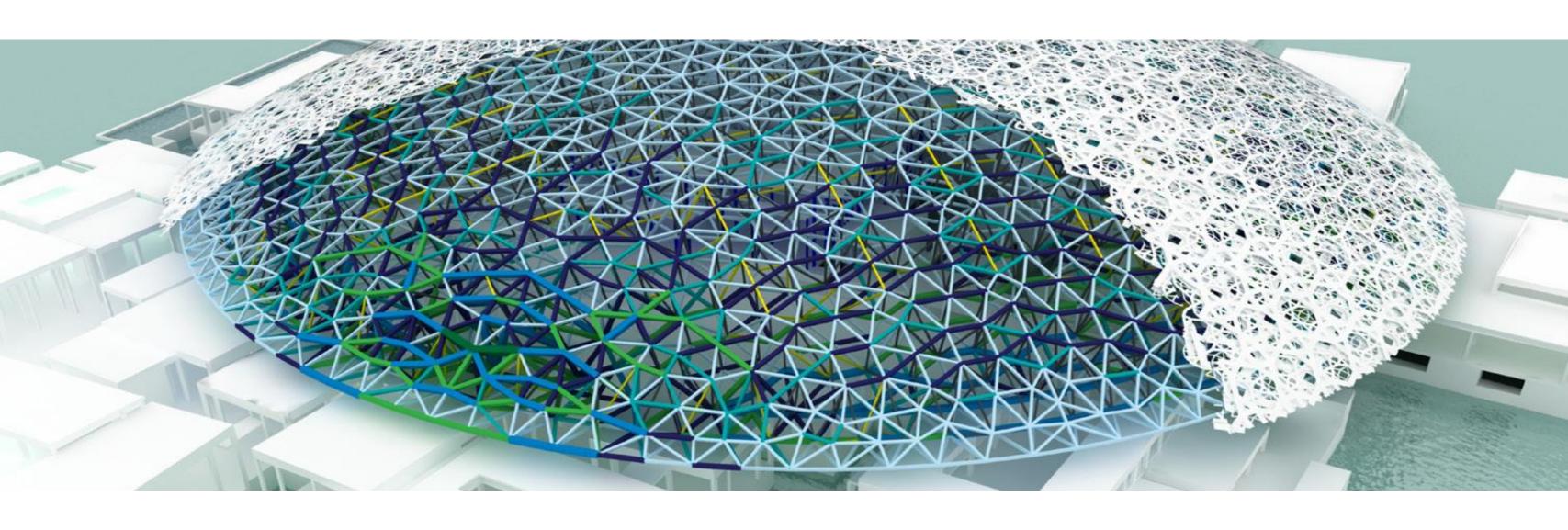- BuroHappold's BIM for Efficiency Focus Group leader

Jose Fandos

- BIM Application Specialist BuroHappold Engineering

- CIBSE BIM Steering Group member

- CIBSE Product Data Templates Chair

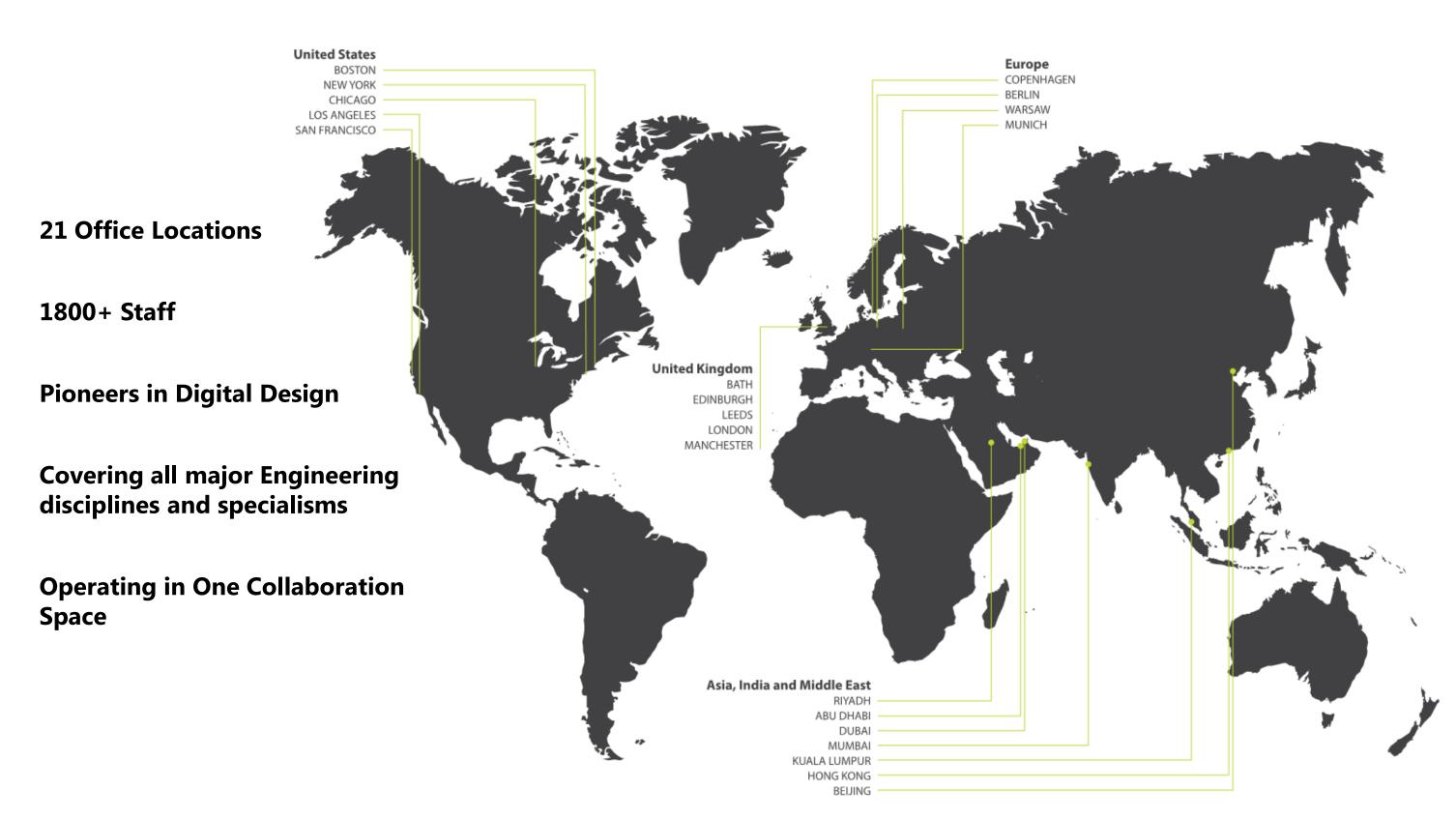- Founder Andekan

- Product Manager Kinship
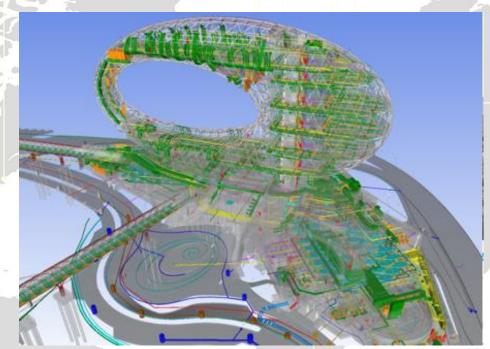
REVIT DATA MINING FOR PROJECT HEALTH INSIGHTS

**BUROHAPPOLD
ENGINEERING**

#AU2017

BUROHAPPOLD – ONE WORLDWIDE DESIGN COMMUNITY

21 Office Locations

1800+ Staff

Pioneers in Digital Design

Covering all major Engineering disciplines and specialisms

Operating in One Collaboration Space

United States
BOSTON
NEW YORK
CHICAGO
LOS ANGELES
SAN FRANCISCO

Europe
COPENHAGEN
BERLIN
WARSAW
MUNICH

United Kingdom
BATH
EDINBURGH
LEEDS
LONDON
MANCHESTER

Asia, India and Middle East
RIYADH
ABU DHABI
DUBAI
MUMBAI
KUALA LUMPUR
HONG KONG
BEIJING

BUROHAPPOLD – MAKING THE VISION VIABLE
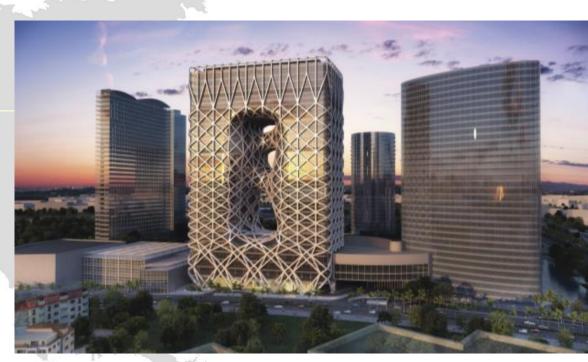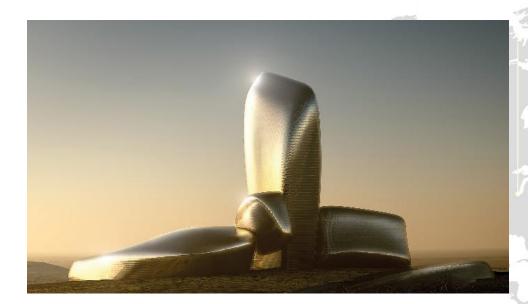

Olympic Stadium - London

MOTF – Dubai

City of Dreams – Macau

We do TINA projects

KACWC – Dhahran, KSA – 2016
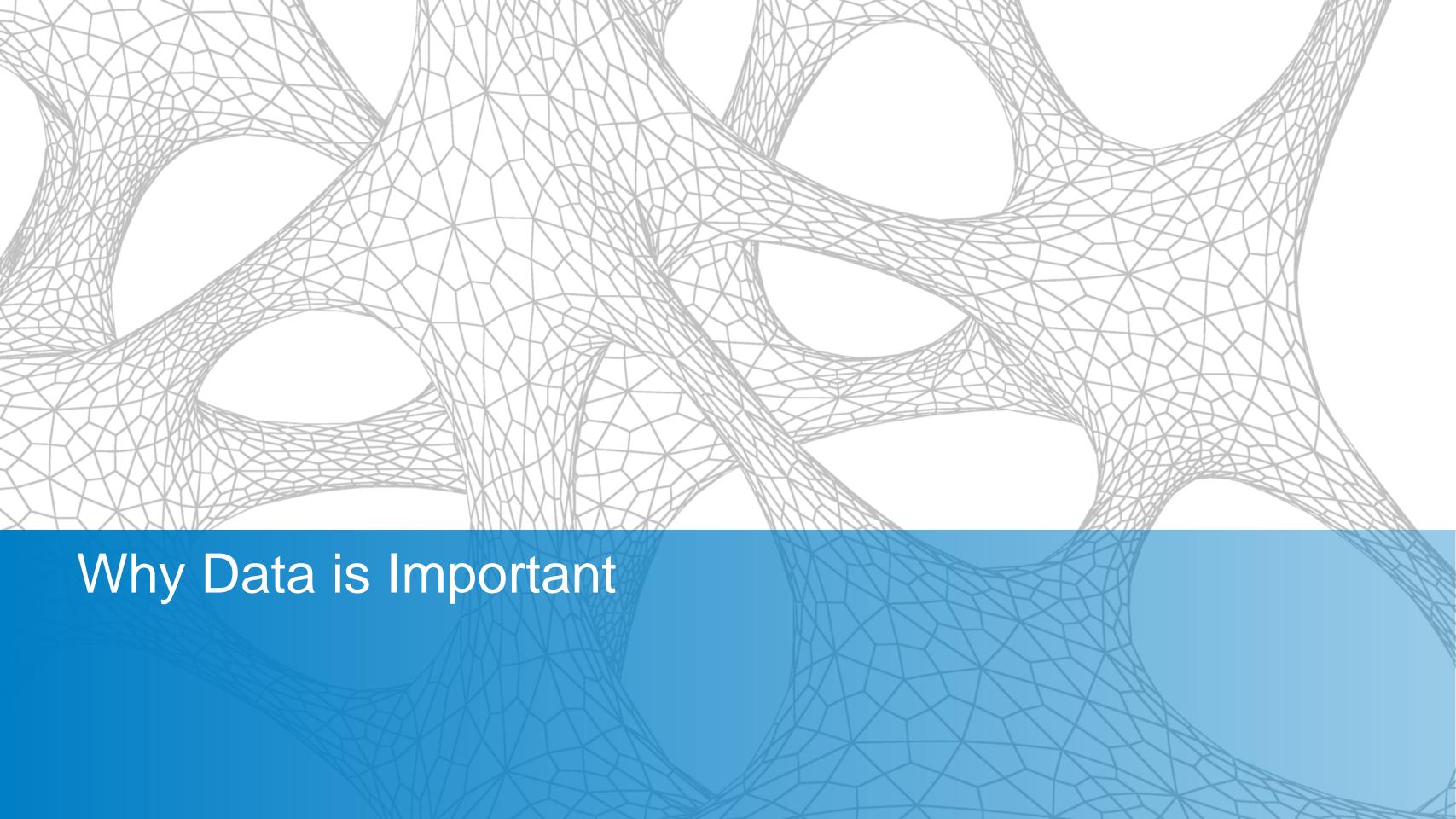

Louvre - Abu Dhabi - 2017
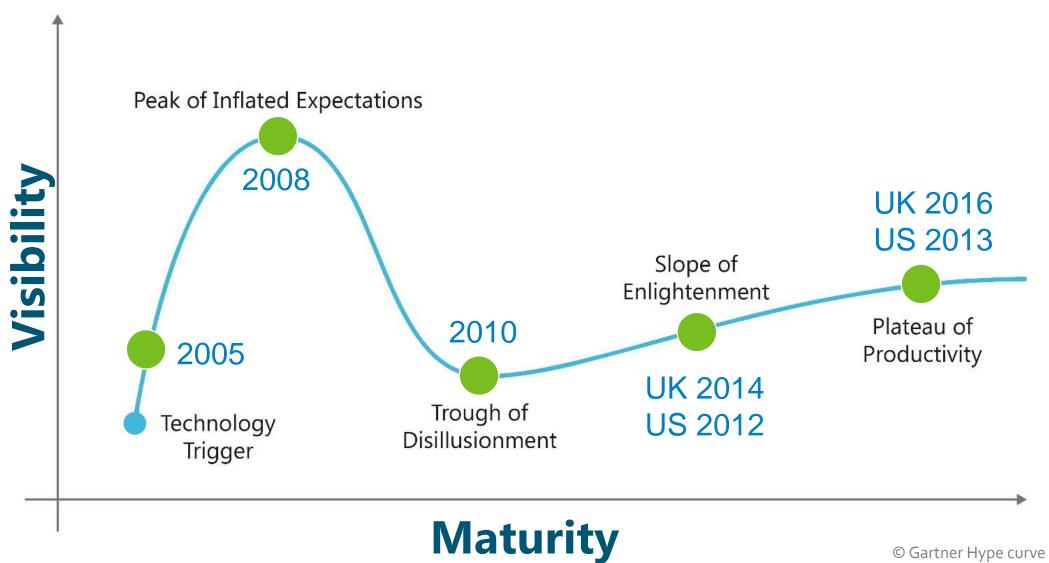
MOTF - Dubai – 2019

There Is No Alternative

but to innovate in BIM and Digital Design

Why Data is Important
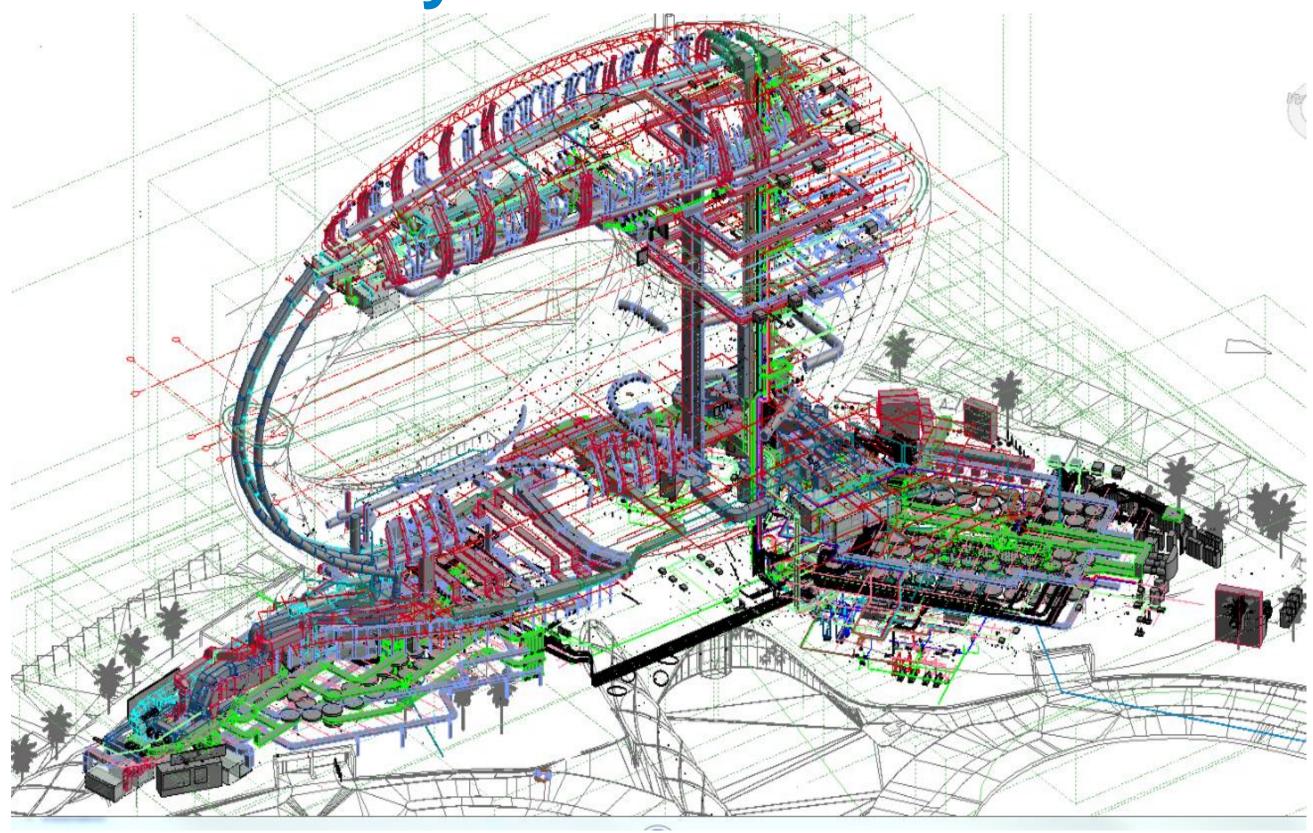
The industry is on a journey with BIM

What our Journey Looks Like

BIM IS THE DIGITAL MEDIUM
THAT ALLOW US TO DIGITISE THE AECO INDUSTRY

To **rethink** our approach to the use of data

To **innovate** and **reshape** the project space

To **transform** our industry

KILL BIM (the word)

DESIGN FROM REAL DATA

Camera based

RFID tagging

Bluetooth

Social Media Analytics

Electronic beam-breaker

WiFi

IN SHORT, ~~SOFTWARE~~ IS EATING THE WORLD*
DATA
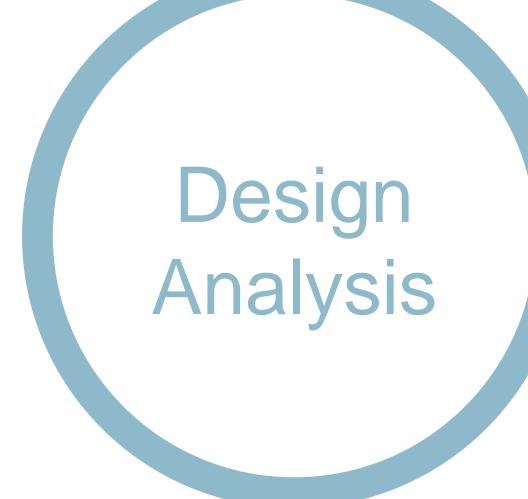
Marc Andreessen 2011
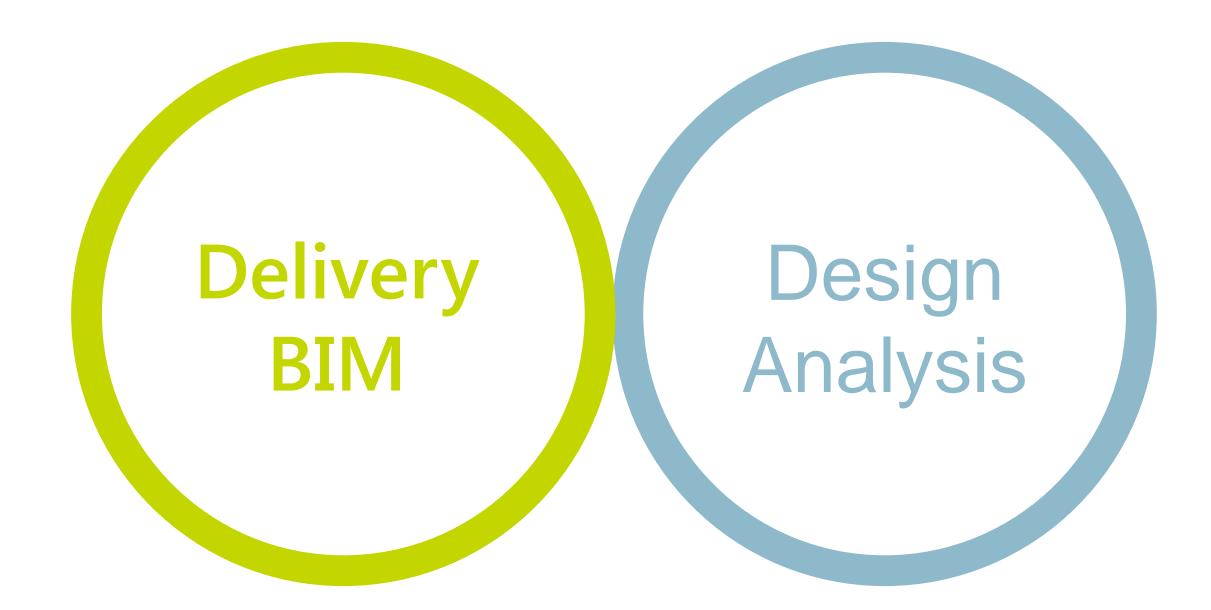
*including AECO

Our Mission:
To harness the power of digital technology, big data analytics and the latest data visualisation platforms to drive greater efficiency and innovation into our designs

BUROHAPPOLD
ENGINEERING

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Integrated Digital Workflows

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How we Mine Data

Which Tools Do We Use

- Several Tools Available

- Power BI by Microsoft

- RF Tools – Purchased

- Adroit – In House Developed

- Kinship – Incubated in BuroHappold
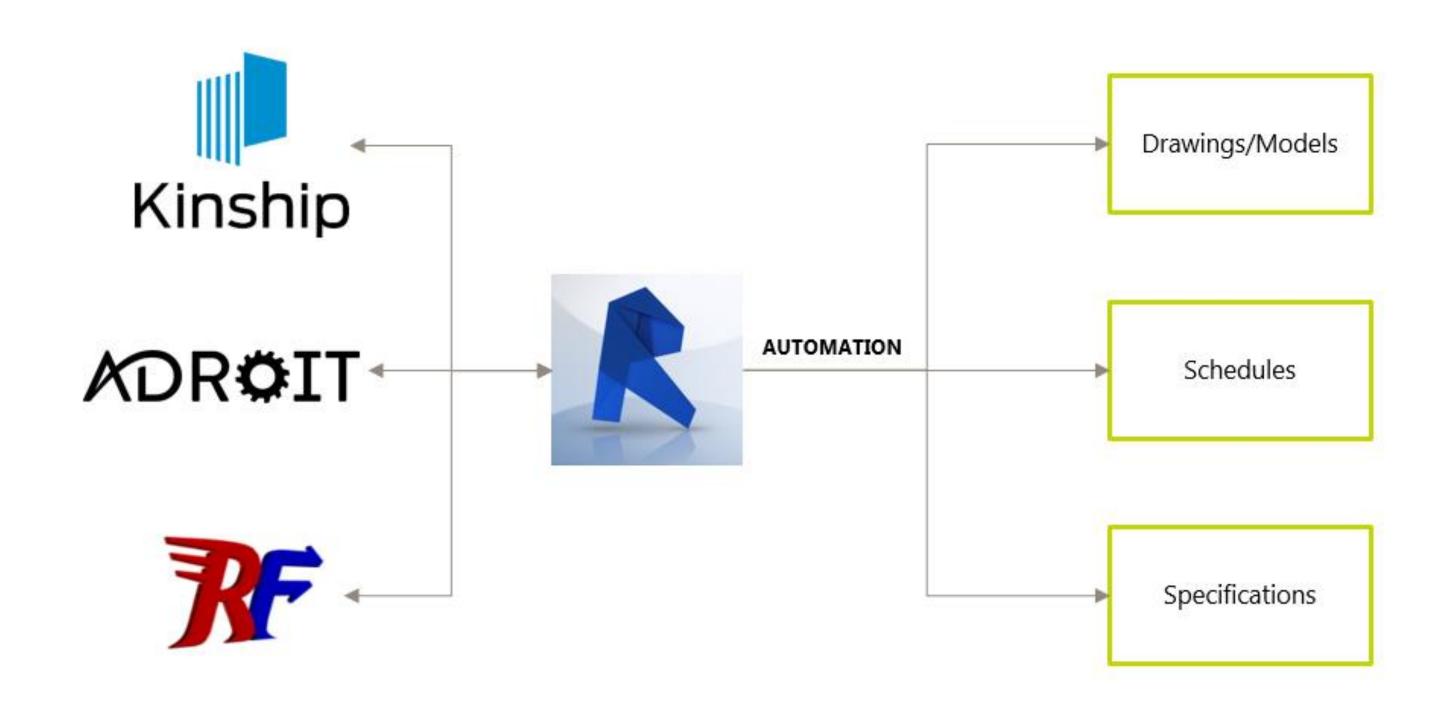
Initial Focus – Right Tools in Place

So what is Kinship

Kinship

CONTENT SEARCH,
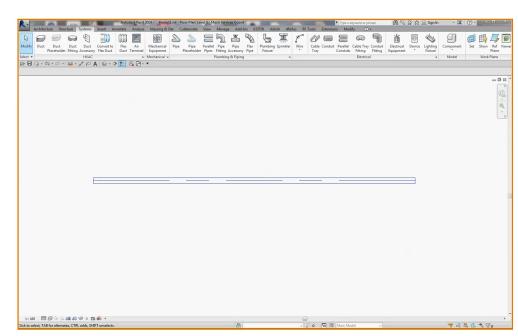
MODEL MANAGEMENT

PROJECT ANALYTICS PLATFORM

FOR ALL PROJECTS AND DISCIPLINES

So what is Kinship
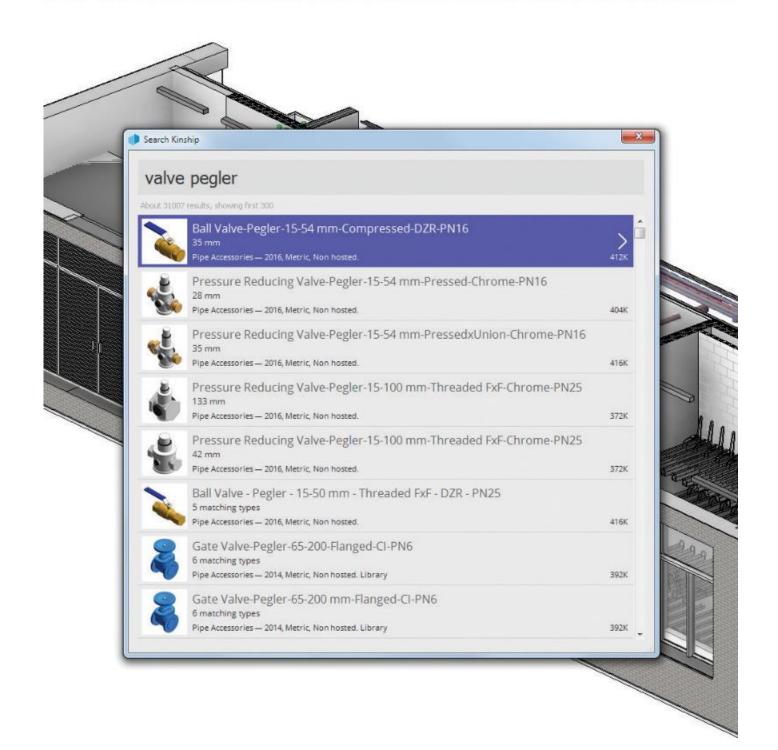
- Library for managing and storing approved content.

- Add projects to automatically capture their content and track project activity.

- Search for library and project content directly from Revit using Kinship add-in

- All family data is indexed for search.

- Approved library content appears first in search results.

- Syncs data quietly in the background.

- Cloud-hosted and accessible from any browser.

Key Features - Content Library

- Component families, system families and groups

- Fully-indexed content including all parameters

- Thumbnail images per type, generated automatically

- Warnings about potential content issues

- A URL for each family where users can comment and see version history

How we Utilise the Tools

DEPLOYING BIM ANALYTICS

- Better Content and Projects

- Insight into Your Data

- 1164 Users in BH

- Every Revit Project Tracked

- Project Health Insights

Adroit tool

- Add-in installed for all Revit users

- Installer

- Access to the database

- Logo

- Internal webpage

MONITORING

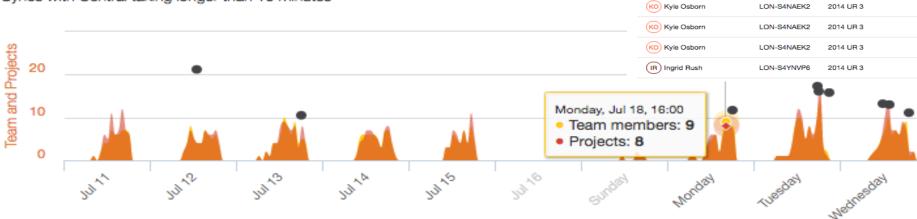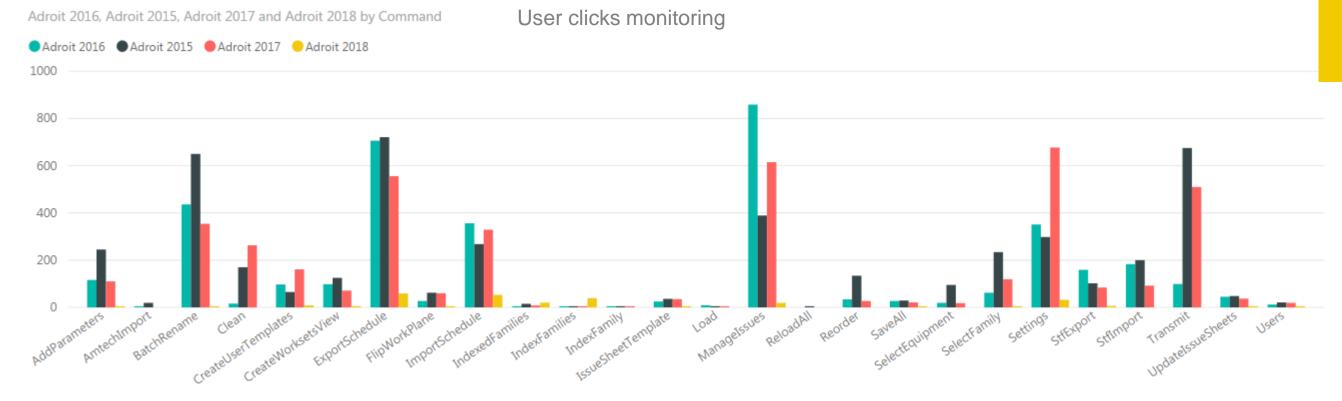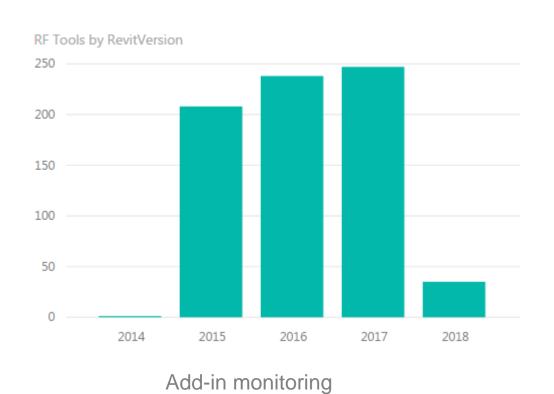| Id	UserName	LogBegin	LogEnd	AddinVersion	RevitVersion
74923	tgorski	24/10/2017 09:11:05	24/10/2017 17:40:28	1.2.24	2016
74924	fhagley	24/10/2017 10:24:24	24/10/2017 16:42:05	1.3.14	2017
74925	eklimkow	24/10/2017 08:49:29	24/10/2017 17:42:38	2.1.30	2015
74926	jplochoc	24/10/2017 09:22:00	24/10/2017 17:42:56	1.2.24	2016
74927	ijackson	24/10/2017 08:16:24	24/10/2017 16:43:31	1.4.5	2018
74928	zshaieb	24/10/2017 08:40:49	24/10/2017 08:43:39	1.2.24	2016
74929	nmcgucka	24/10/2017 12:02:31	24/10/2017 16:43:41	1.3.14	2017
74930	dbulakh	24/10/2017 13:15:27	24/10/2017 17:44:20	1.2.24	2016
74931	gdoyle	24/10/2017 16:24:15	24/10/2017 16:44:23	1.3.14	2017
74932	tgorski	24/10/2017 09:09:53	24/10/2017 17:44:40	1.2.24	2016
74933	rmajster	24/10/2017 09:58:23	24/10/2017 17:45:39	2.1.30	2015
74934	emielnic	24/10/2017 09:38:12	24/10/2017 17:49:31	1.2.24	2016
74935	mtsikos	24/10/2017 09:05:56	24/10/2017 16:50:51	1.3.14	2017
74936	jharris	24/10/2017 09:28:37	24/10/2017 16:51:04	1.3.14	2017
74937	mtsikos	24/10/2017 16:20:37	24/10/2017 16:51:45	1.3.14	2017
74938	mlilia	24/10/2017 12:02:21	24/10/2017 17:52:01	1.3.14	2017
74939	jloke	24/10/2017 09:18:01	24/10/2017 17:53:08	1.2.24	2016
74940	apullen	24/10/2017 11:11:01	24/10/2017 16:55:41	2.1.30	2015
74941	apullen	24/10/2017 09:28:51	24/10/2017 16:55:50	2.1.30	2015
74942	apullen	24/10/2017 10:28:18	24/10/2017 16:56:38	2.1.30	2015
74943	jfuller	23/10/2017 16:37:04	24/10/2017 16:58:29	1.3.14	2017
74944	gdoyle	24/10/2017 16:53:01	24/10/2017 17:00:38	1.3.14	2017
74945	jmargett	24/10/2017 14:46:22	24/10/2017 17:04:37	1.3.14	2017
74946	czhong	24/10/2017 08:53:32	24/10/2017 09:04:58	2.1.30	2015
74947	jplochoc	24/10/2017 17:45:54	24/10/2017 18:06:59	1.2.24	2016
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74949	lwilliam	24/10/2017 08:34:07	24/10/2017 17:07:47	1.4.5	2018
74950	gdoyle	24/10/2017 14:31:45	24/10/2017 17:11:40	1.3.14	2017
74951	gdoyle	24/10/2017 17:06:55	24/10/2017 17:11:40	1.3.14	2017
74952	jfuller	24/10/2017 16:59:03	24/10/2017 17:12:11	1.3.14	2017

Id	Library	Command	UserName	Date
13743	BH_Revit2017_Ribbon	BatchRename	mlilia	23/10/2017 17:49:45
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13746	BH_Revit2016_Ribbon	Settings	ngubser	23/10/2017 18:46:50
13747	BH_Revit2016_Ribbon	ManageIssues	ngubser	23/10/2017 18:47:32
13748	BH_Revit2018_Ribbon	ManageIssues	jloftus	24/10/2017 10:07:10
13749	BH_Revit2018_Ribbon	ManageIssues	jloftus	24/10/2017 10:07:59
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13757	BH_Revit2016_Ribbon	ExportSchedule	tmeineck	24
13758	BH_Revit2016_Ribbon	ImportSchedule	tmeineck	24
13759	BH_Revit2017_Ribbon	Settings	rstevens	24
13760	BH_Revit2017_Ribbon	Settings	jziolkow	24
13761	BH_Revit2017_Ribbon	Users	jziolkow	24
13762	BH_Revit2017_Ribbon	ExportSchedule	rstevens	24
13763	BH_Revit2017_Ribbon	ExportSchedule	rstevens	24
13764	BH_Revit2017_Ribbon	CreateUserTemplates	jziolkow	24
13765	BH_Revit2016_Ribbon	ExportSchedule	tmeineck	24
13766	BH_Revit2016_Ribbon	ImportSchedule	tmeineck	24
13767	BH_Revit2016_Ribbon	ImportSchedule	tmeineck	24
13768	BH_Revit2016_Ribbon	ExportSchedule	tmeineck	24
13769	BH_Revit2016_Ribbon	ExportSchedule	tmeineck	24
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13772	BH_Revit2016_Ribbon	ImportSchedule	tmeineck	24

Picture 2 – User clicks monitoring

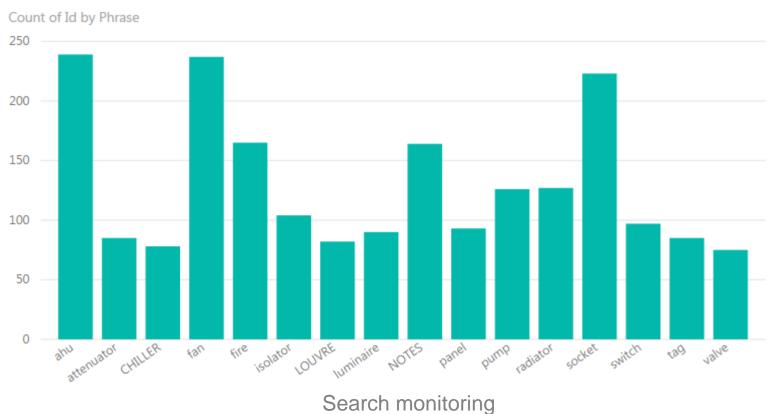| Id	SearchType	Phrase	Path		
7260	2	fire	\\SRV-bath03\non_project\Bath Region\Bath Building Services\Bath MEP Revit\Development Work (by permission only)\Addin\Files\2017\1.3.14\setting		1
7261	0	switched socket	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Electrical\Sockets_BHm_ElectricalFixtures_Sockets.rfa		7
7262	0	fan coil	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Mechanical\HVAC Equipment_BHm_MechEquip_HVACEquipmentFanCoilUnitHorizontal.rfa		
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7265	0	buffer vessel	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Mechanical\HVAC Equipment\Symbols_BHm_DetailItem_HVACEquipmentPressureVessel.rfa		
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7267	0	grille	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Mechanical\HVAC Air Terminals_BHm_AirTerminals_AirTerminalsSupplyGrilleCircularCeiling.		
7268	0	bus	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Electrical\Isolators_BHm_ElectricalFixtures_Isolators.rfa		
7269	0	bus	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Electrical\Isolators_BHm_ElectricalFixtures_Isolators.rfa		
7270	0	busbar	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Trunking\Busbar Trunking\Fittings\Elbows_BHm_BusbarFitting_JunctionUnitSmallPower.rfa		
7271	0	busbar	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Trunking\Busbar Trunking\Fittings\Elbows_BHm_BusbarFitting_JunctionUnitSmallPower.rfa	Standard	23/10/2017 11:47:07
7272	0	busbar	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Trunking\Busbar Trunking\Fittings\Elbows_BHm_BusbarFitting_JunctionUnit.rfa	Standard	23/10/2017 11:47:17
7273	0	module	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Electrical\Panels_BHm_LightingDevices_Panels.rfa	Area Control Module	23/10/2017 12:16:43
7274	0	module	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Electrical\Panels_BHm_LightingDevices_Panels.rfa	Area Control Module	23/10/2017 12:17:17
7275	0	module	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Electrical\Panels_BHm_LightingDevices_Panels.rfa	Area Control Module	23/10/2017 12:18:18
7276	0	module	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Electrical\Panels_BHm_LightingDevices_Panels.rfa	Area Control Module	23/10/2017 12:18:38
7277	0	grille	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Mechanical\HVAC Air Terminals_BHm_AirTerminals_AirTerminalsSupplyGrilleRectangularCeiling.rfa	Supply Grille	23/10/2017 12:31:16
7278	0	radiator	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Mechanical\HVAC Equipment_BHm_MechEquip_HVACEquipmentRadiator.rfa	Radiator	23/10/2017 14:39:00
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7280	0	speaker	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Electrical\Communication_BHm_DataDevices_CommunicationSpeakerWall.rfa	Wall Speaker	23/10/2017 17:30:34
7281	0	air terminal	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Mechanical\HVAC Air Terminals_BHm_AirTerminals_AirTerminalsExhaustOpenEndCircular.rfa	Circular Extract Open End	24/10/2017 09:34:51
7282	0	air termianl	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Mechanical\HVAC Air Terminals_BHm_AirTerminals_AirTerminalsLouvre.rfa	Louvre (Vertical Blades)	24/10/2017 09:52:20
7283	0	air terminal	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Mechanical\HVAC Air Terminals_BHm_AirTerminals_AirTerminalsExtractLinearSlotCeiling.rfa	Linear slot	24/10/2017 10:05:37
7284	0	air terminal	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Mechanical\HVAC Air Terminals_BHm_AirTerminals_AirTerminalsSupplyLinearSlotCeiling.rfa	Supply Linear Slot	24/10/2017 10:06:18
7285	0	KEY	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Electrical\Switches_BHm_LightingDevices_Switches.rfa	Key Switch (1 Gang)	24/10/2017 11:20:00
7286	0	SWITCH	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Electrical\Switches_BHm_LightingDevices_Switches.rfa	Standard Switch (2 Gangs)	24/10/2017 11:24:54
7287	0	SWITCH	L:\BH-Revit\Revit2017\Libraries\UK_BH Library\BH MEP\Electrical\Switches_BHm_LightingDevices_Switches.rfa	Standard Switch (3 Gangs)	24/10/2017 11:32:50
7288	2	Air Terminal	C:\Program Files (x86)\Buro Happold\Adroit\2017\settings\EquipmentSchedules.rte	Air Terminals - Ceiling Extract Air Diffusers	24/10/2017 13:25:18

Picture 3 – User search monitoring

Dashboarding for BIM Analytics
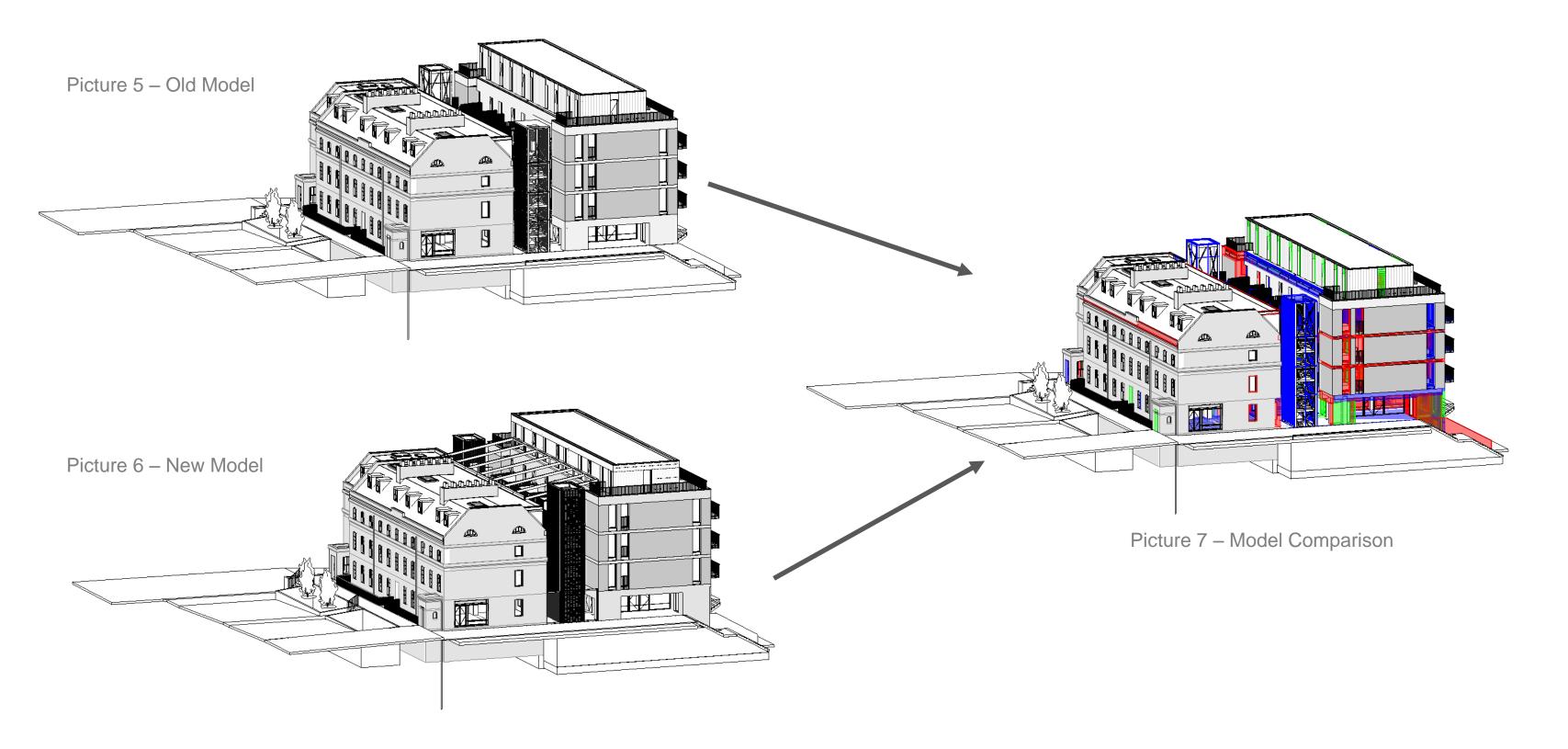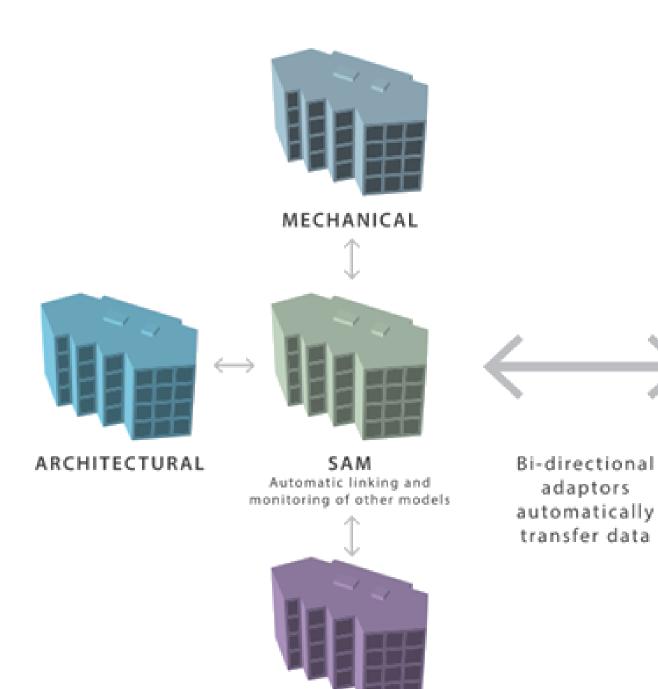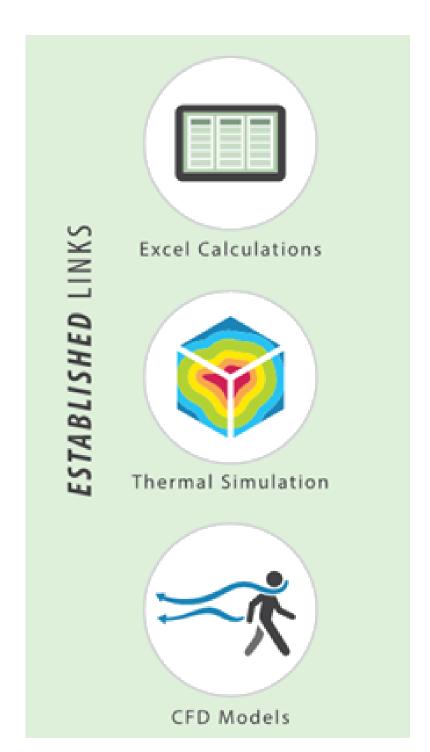
Power BI

Adroit 2016, Adroit 2015, Adroit 2017 and Adroit 2018 by Command

User clicks monitoring

● Adroit 2016   ● Adroit 2015   ● Adroit 2017   ● Adroit 2018

RF Tools by RevitVersion

Add-in monitoring

Count of Id by Phrase

Search monitoring

MODEL CHECKER

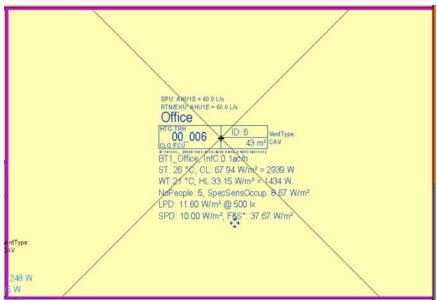Picture 5 – Old Model

Picture 6 – New Model

Picture 7 – Model Comparison

SINGLE ANALYSIS MODEL (SAM)

SINGLE ANALYSIS MODEL (SAM)
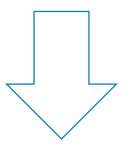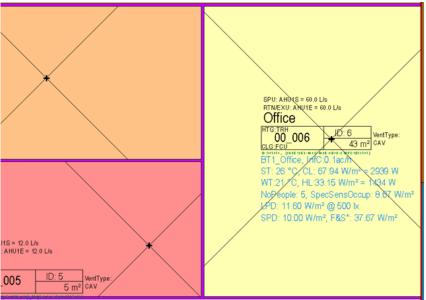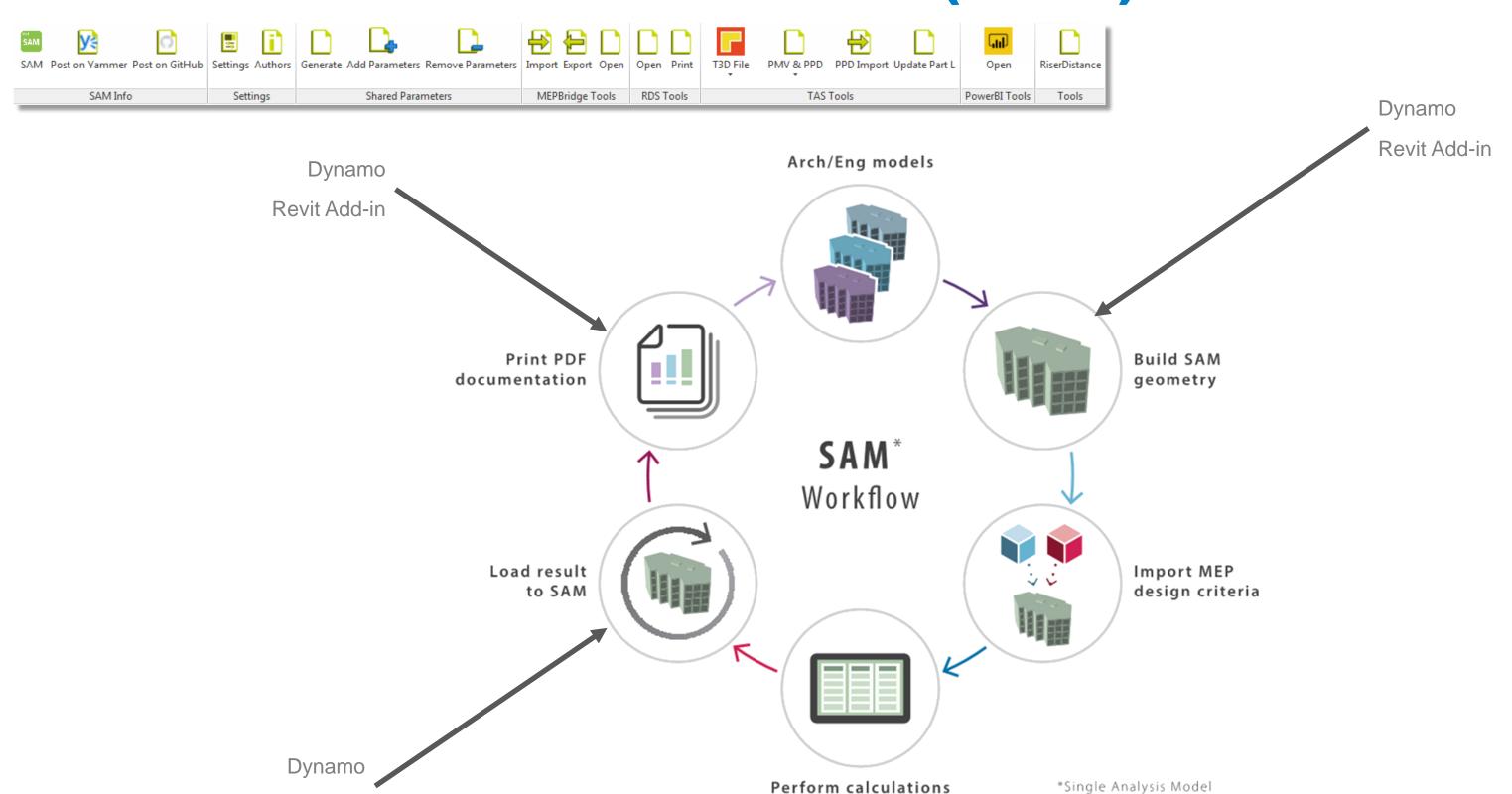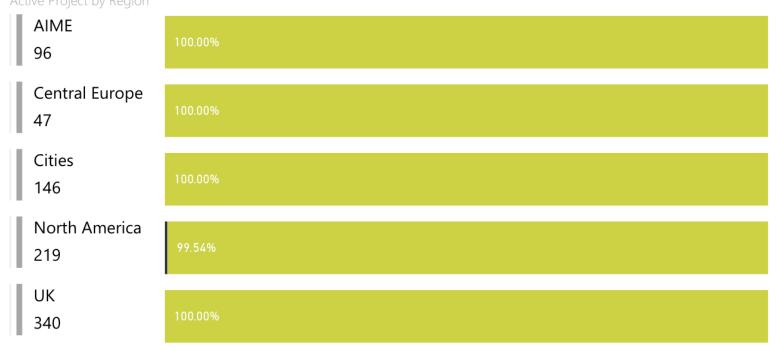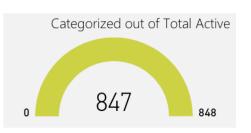
BIM Policy Tracking
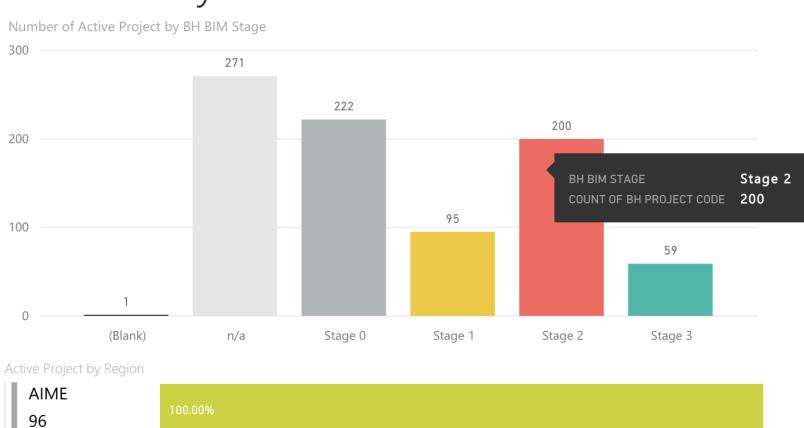
BIM Policy Tracker Dashboard

Number of Active Project by BH BIM Stage

BH BIM STAGE	**Stage 2**
COUNT OF BH PROJECT CODE	**200**

(bar chart values)
- (Blank): 1
- n/a: 271
- Stage 0: 222
- Stage 1: 95
- Stage 2: 200
- Stage 3: 59

Active Project by Region

Region		%
AIME	96	100.00%
Central Europe	47	100.00%
Cities	146	100.00%
North America	219	99.54%
UK	340	100.00%

BIM Stage Status ● (Blank) ● Categorized

848 total active project over £ 40k

Categorized out of Total Active
0 — 847 — 848

[Update the BIM info](#)

BIM Policy Recap
For every project > £40k:

1. Assign a "BIM Stage"
2. Assign a "Project BIM Lead"
3. Ensure the "project BIM Lead" is qualified

BH BIM Stage 0
- We're not using BIM

BH BIM Stage 1
- We're generating BIM internally for our own efficiency.
- We're sharing and delivering traditional 2D deliverables.

BH BIM Stage 2
- We're generating BIM along with the wider project team.
- We're sharing models and referencing others work.
- The BIM may form part of our deliverables.
- We may be generating data exports form our models but we're delivering these via traditional means.

BH BIM Stage 3
- We're using BIM in a live multidisciplinary environment along with the wider project team.
- The BIM forms part of our deliverables.
- Data is consumed directly from our model.
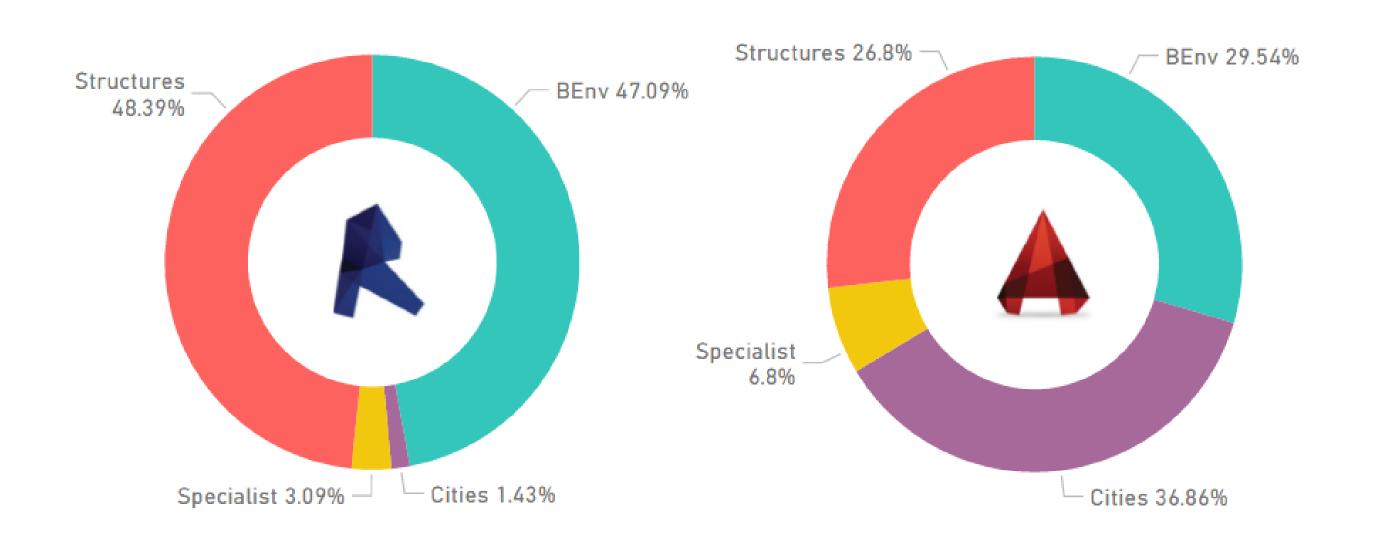
Revit v AutoCAD Usage

Revit vs Autocad Usage _ UK
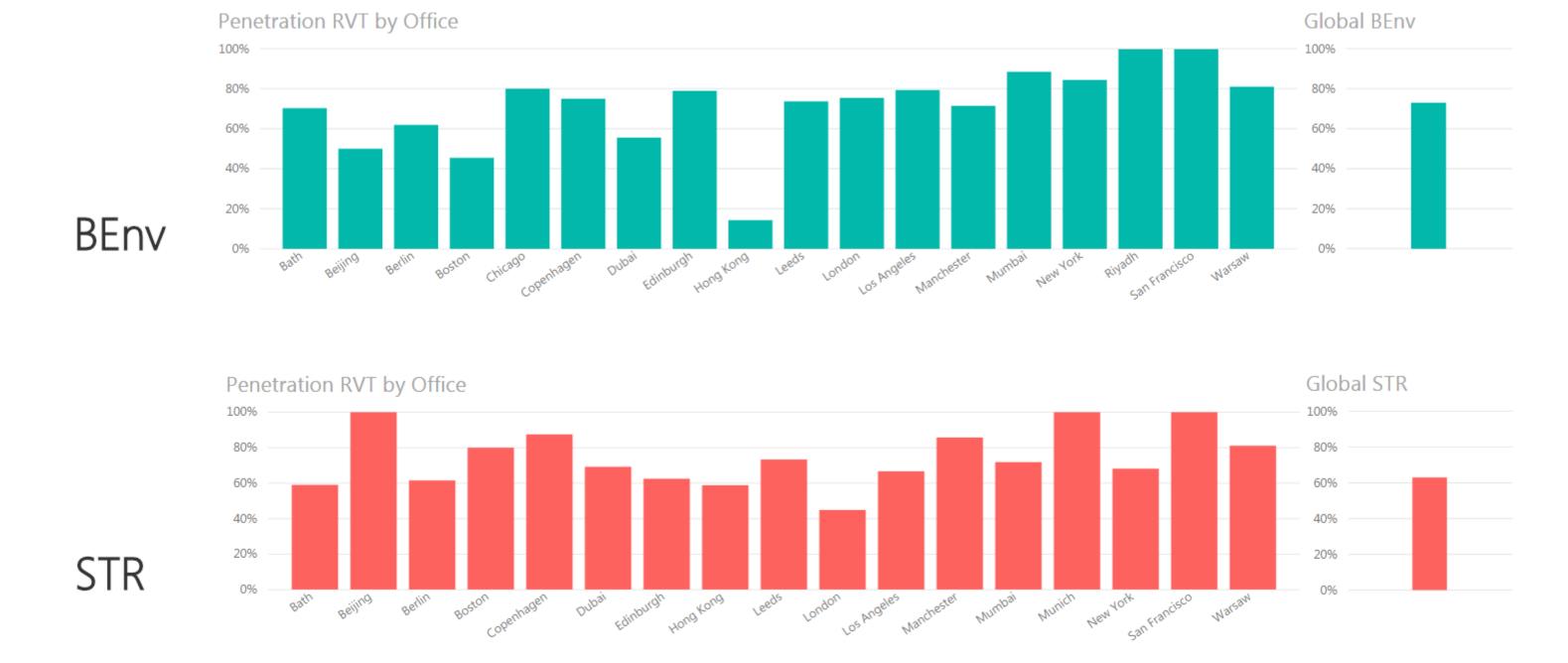
Monthly Average

Total Revit Hours by DEP:

Structures 48.39%

BEnv 47.09%

Specialist 3.09%

Cities 1.43%

Total AutoCAD Hours by DEP:

Structures 26.8%

BEnv 29.54%

Specialist 6.8%

Cities 36.86%

Revit Adoption

Penetration RVT by Office — BEnv

Global BEnv

Penetration RVT by Office — STR

Global STR

Revit Penetration Resume BEnv/STR

PC & Laptop Spec Compliance

LIST OF MODELS:

◉ Select All
☐ RSN://RS15-CEN01/033462 - JAGUAR LAND ROVER/F04 - STRUCTURAL/GTP-BHE-ZZ-ZZ-M3-S-00-0001.RVT
☐ RSN://RS15-CEN01/033462 - JAGUAR LAND ROVER/F04 - STRUCTURAL/GTP-BHE-ZZ-ZZ-M3-S-00-0002.RVT
☐ RSN://RS15-CEN01/033462 - JAGUAR LAND ROVER/F04 - STRUCTURAL/GTP-BHE-ZZ-ZZ-M3-S-00-0003.RVT
☐ RSN://RS15-CEN01/033462 - JAGUAR LAND ROVER/F05 - MEP - BUILDING SERVICES/GTP-BHE-ZZ-ZZ-M3-J-00-0001.RVT
■ RSN://RS15-CEN01/033462 - JAGUAR LAND ROVER/F05 - MEP - BUILDING SERVICES/GTP-BHE-ZZ-ZZ-M3-J-00-0002.RVT
☐ RSN://RS15-CEN01/033462 - JAGUAR LAND ROVER/F05 - MEP - BUILDING SERVICES/GTP-BHE-ZZ-ZZ-M3-J-00-0003.RVT

MACHINE SPECS
033462 - JLR

model id	user_id	surname	Latest dat...	First Machine Name	First Location	...	First Machin...	First Machine M...	First Processor.1	Max of Clock Spe...	Max of...▼	Max of Dis...	Max of GFX ...
1570	1096		9/29/2017	BTH-S4S68237	Bath	1	Desktop	ThinkStation P300	Intel(R) Xeon(R) CPU E3-1276 v3	3.60	33	244	2.10
	1123	Harris	10/11/2017	BTH-S4E86916	Bath	1	Desktop	ThinkStation E32	Intel(R) Xeon(R) CPU E3-1275 v3	3.50	33	244	2.10
	1197	Lidbetter	7/13/2017	BTH-S4N97261	Bath	1	Desktop	ThinkStation P300	Intel(R) Xeon(R) CPU E3-1276 v3	3.60	33	244	2.10
	399	Zerebilo	4/11/2017	EDN-S4V48842	Edinburgh	1	Desktop	ThinkStation P310	Intel(R) Core(TM) i7-6700 CPU	3.40	33	488	4.19
	404	Thatcher	10/4/2017	BTH-S4C53685	Bath	1	Desktop	ThinkStation E32	Intel(R) Xeon(R) CPU E3-1225 v3	3.20	33	477	2.10
	449	Stepien	3/31/2017	MAN-S4P95350	Manchester	1	Desktop	ThinkStation P300	Intel(R) Xeon(R) CPU E3-1276 v3	3.60	33	244	2.10
	357	Kalpakidi	12/21/2016	EDN-S4P23095	Edinburgh	1	Desktop	ThinkStation P700	Intel(R) Xeon(R) CPU E5-2620 v3	2.40	16	286	4.19
	1242	Sklavounos	8/18/2017										

DESKTOP

model id	user_id	surname	Latest d...▼	Last Machine Name	First Location	...	First Machin...	First Machine M...	First Processor.1	Max of Clock S...	Max of...	Max of Disk...	Max of GFX...
1570	410	Goksel	10/13/2017	BTH-R90JA405	Bath	2	Laptop	ThinkPad W541	Intel(R) Core(TM) i7-4810MQ CPU	2.80	33	488	2.16
	411	Challand	10/13/2017	BTH-R9W8K3W	Bath	2	Laptop	ThinkPad W530	Intel(R) Core(TM) i7-3820QM CPU	2.70	33	305	2.16
	1244	Parshad	10/5/2017	BTH-PC0EHEBY	Bath	2	Laptop	ThinkPad T460p	Intel(R) Core(TM) i7-6820HQ CPU	2.70	16	488	2.10
	412	Trowles	9/29/2017	BTH-PC04TCP7	Bath	2	Laptop	ThinkPad T440p	Intel(R) Core(TM) i7-4600M CPU	2.90	16	477	2.16
	564	Stevenson	9/8/2017	EDN-PB00GTWV	Edinburgh	2	Laptop	ThinkPad T440p	Intel(R) Core(TM) i7-4700MQ CPU	2.40	16	477	1.05
	1105	Honjigawa	8/30/2017	EDN-PC05CR1J	Datacentre	2	Laptop	ThinkPad T440p	Intel(R) Core(TM) i7-4600M CPU	2.90	8	477	1.05
	599	King	7/10/2017	EDN-PC0A4KTE	Edinburgh	2	Laptop	ThinkPad T440p	Intel(R) Core(TM) i7-4600M CPU	2.90	16	477	2.16
	1241	Kmita	6/8/2017	BTH-PC0EH5RP	Bath	2	Laptop	ThinkPad T460p	Intel(R) Core(TM) i7-6820HQ CPU	2.70	16	488	2.10
	1362	Bischoff	5/30/2017	BTH-PF0NNWAP	Bath	2	Laptop	ThinkPad T460p	Intel(R) Core(TM) i7-6820HQ CPU	2.70	16	488	2.10
	440	Standivan	4/24/2017	BTH-PC05CNGQ	Bath	2	Laptop	ThinkPad T440p	Intel(R) Core(TM) i7-4600M CPU	2.90	16	477	2.16
	116	Fandos	9/1/2016	LON-PBE5M10	Datacentre	1	Laptop	ThinkPad T430	Intel(R) Core(TM) i5-3320M CPU	2.60	8	305	2.16

LAPTOP

Project Case Study

- Project ground to a halt
- Long saving times
- Long opening times
- 99 managed models
- Total size of models – 5.4 GB
- 61 team members working and saving actively
- Project worked on by several offices – Bath, Edinburgh, Warsaw & Mumbai

Models
99 (5.4 Gb)

Families
14,858 (66% unused)

Instances
1,018,994

Last SwC
Today 15:33 from PP

SwC
1,898 this past week from 61 team members

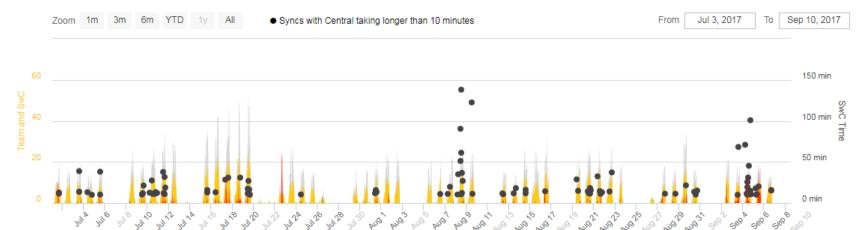Version
Revit 2017

Models

Total
99

using
5.4 Gb

Active model	Active designers	Full re-host	UK mean sync time (secs)	India mean sync time (secs)
C05-JPQ-M-STA-C-CT-AL-AZ-0000	3 UK	20.05.17	45	N/A
C05-JPQ-M-STA-C-ME-AL-AZ-0000*	5 UK, 7 India	08.09.17	210	405
C05-JPQ-M-STA-C-ME-AL-AZ-0001	2 UK	20.05.17	41	N/A
C05-JPQ-M-STA-C-ST-AL-AZ-0000	3 UK	12.09.17	32	N/A
C05-JPQ-M-CAC-C-AD-AL-AZ-0000	3 UK	20.05.17	61	N/A
C05-JPQ-M-STA-C-EL-AL-AZ-0000	5 UK, 2 India	14.09.17	120	246
C05-JPQ-M-STA-C-PL-AL-AZ-0000	1 UK	20.09.17	42	N/A
C05-JPQ-M-STA-C-FP-AL-AZ-0000	1 UK, 3 India	27.09.17	88	203
C05-JPQ-M-STA-C-ST-AL-AZ-0004	None today	N/A	N/A	N/A
New - C05-JPQ-M-STA-C-FA-AL-AZ-0000	1 UK, 1 India	20.05.17	53	62

Project Case Study – Analysis

- Re-hosting not done regularly
- 46% of content not purged
- Frequency of saves – too frequent
- Individual model sizes too big
- CAD links within the models
- Revit links pointing to local server
- System calculations were on
- Family sizes too big
- Number of warnings excessive
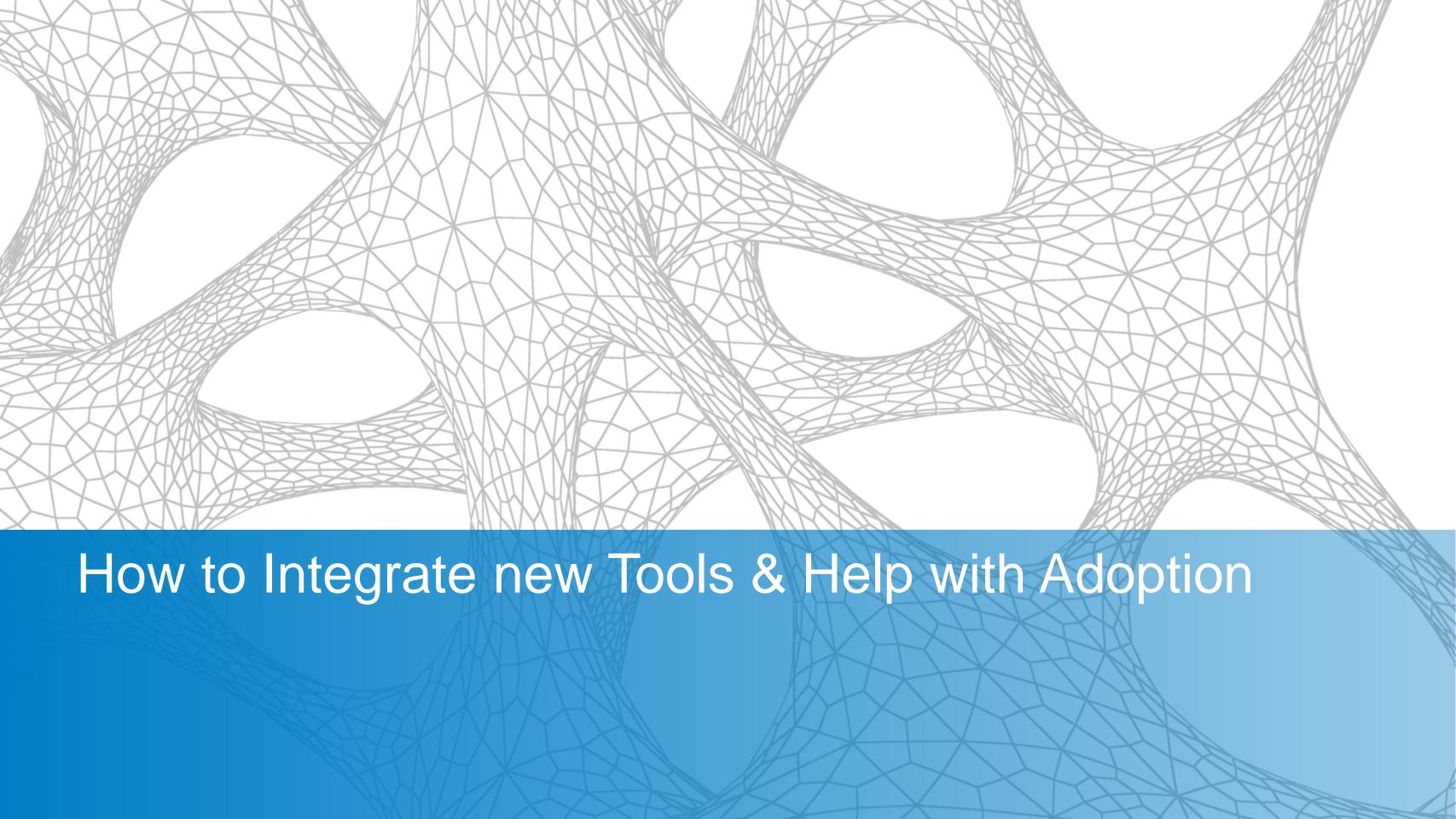- Scheduled opening of models not used

	Machine	Revit Version	Families	Instances	SwC Time	Project Size	Comments	Date
MN	BTH-S4Y59879	2017 .2.1	0 | 0 | 0	0	1 min	281.2 Mb		Today 18:16
SK	MUM-PC0BTFXN	2017 .2.1	0 | 0 | 0	0	2 min	283.18 Mb		Today 17:55
PP	MUM-PC0HJYFF	2017 .2.1	0 | 0 | 0	+2	3 min	269.19 Mb		Today 17:52
PM	EDN-PB0203C5	2017 .2.1	0 | 0 | 0	-51	4 min	273.8 Mb		Today 17:49
PP	MUM-PC0HJYFF	2017 .2.1	0 | 0 | 0	0	2 min	255.7 Mb		Today 17:43
SK	MUM-PC0BTFXN	2017 .2.1	0 | 0 | 0	+2	6 min	269.86 Mb		Today 17:41
IS	BTH-R90F9HG2	2017 .2.1	0 | 0 | 0	+24	3 min	273.48 Mb		Today 17:36

Project Case Study – Solutions

- Re-hosting done every week
- Purge done daily
- Individual SwC once an hour
- Individual model sizes limited to 350MB
- Ghost model for CAD links
- All Revit links pointing to Revit Server
- System calculations all off
- Families curated
- Number of warnings dropped to 2%
- RTV Exporter Pro used to open models

Active model	Active designers	Full re-host	UK mean sync time (secs)	India mean sync time (secs)
C05-JPQ-M-STA-C-CT-AL-AZ-0000	1 UK	10.10.17	26	N/A
C05-JPQ-M-STA-C-ME-AL-AZ-0000	8 UK, 3 India	10.10.17	95	285
C05-JPQ-M-STA-C-ME-AL-AZ-0001	3 UK	10.10.17	80	N/A
C05-JPQ-M-STA-C-ST-AL-AZ-0000	6 UK, 1 India	10.10.17	92	200
C05-JPQ-M-CAC-C-AD-AL-AZ-0000	3 UK	10.10.17	53	N/A
C05-JPQ-M-STA-C-EL-AL-AZ-0000	9 UK	10.10.17	88	N/A
C05-JPQ-M-STA-C-PL-AL-AZ-0000	3 UK	10.10.17	55	N/A
C05-JPQ-M-STA-C-FP-AL-AZ-0000	2 UK, 6 India	10.10.17	160	140
C05-JPQ-M-STA-C-ST-AL-AZ-0004	None	10.10.17	N/A	N/A
C05-JPQ-M-STA-C-FA-AL-AZ-0000	1 UK, 1 India	10.10.17	17	31

How to Integrate new Tools & Help with Adoption

How do we build a good plan?

Computational Collective *ⓘ*

Search

Code ↑↓
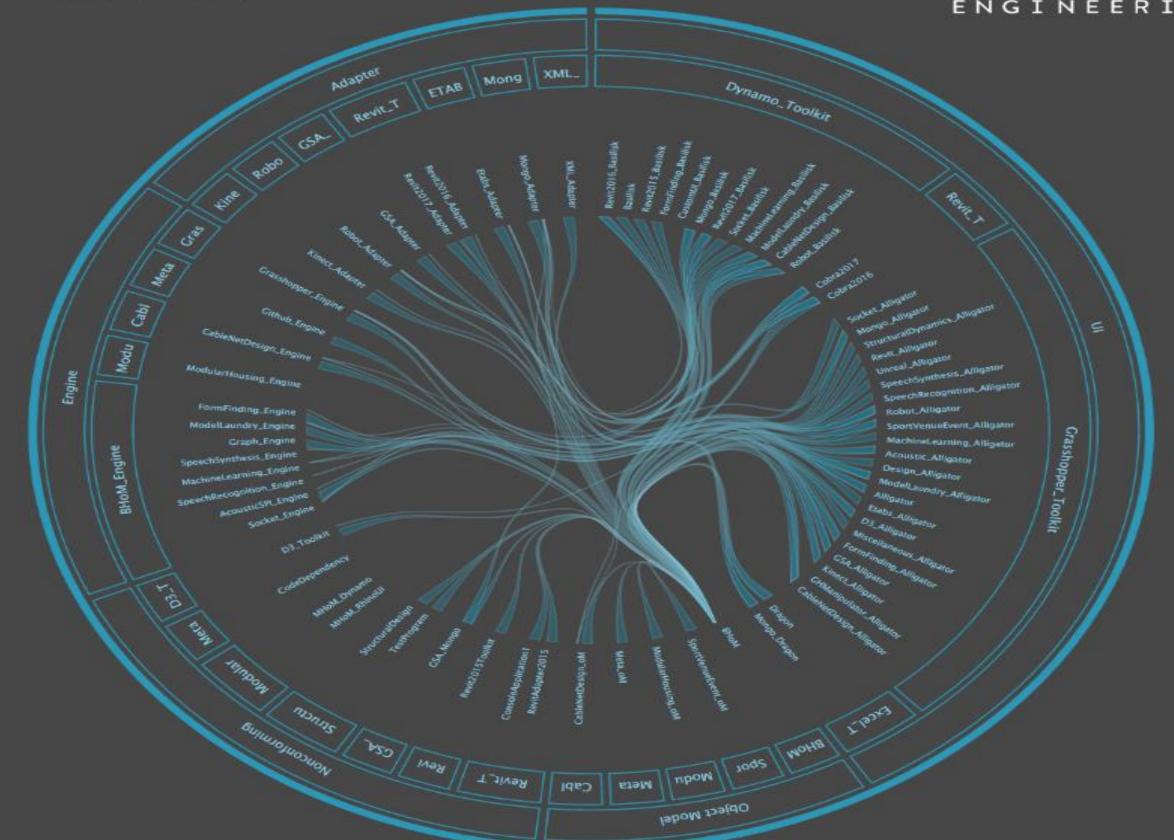codeType
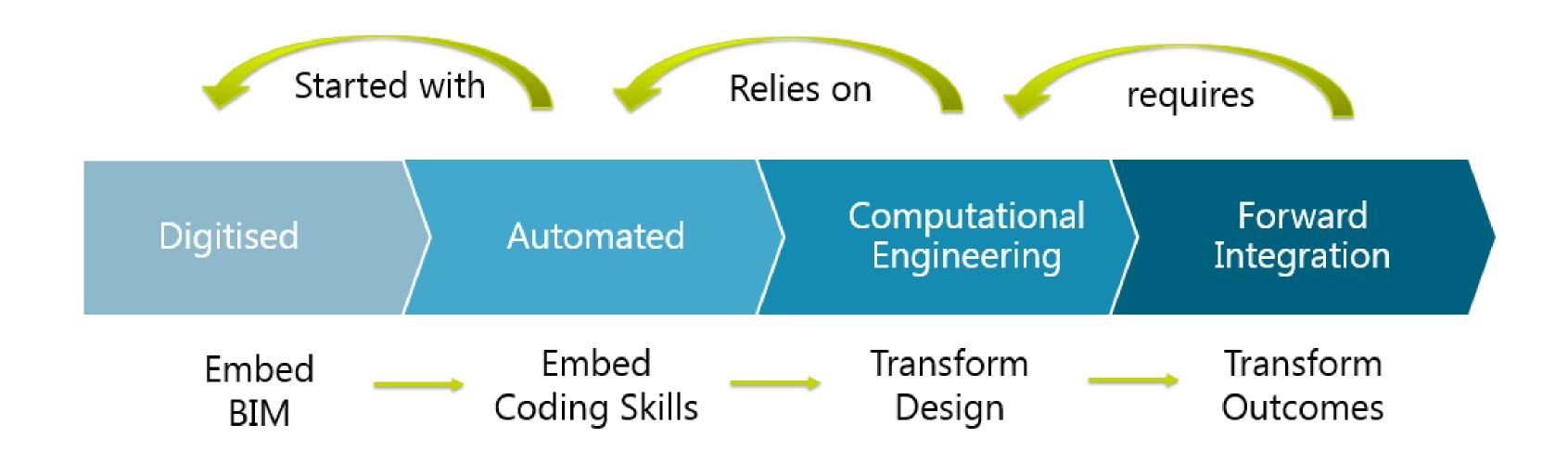All ▼
repo
All ▼

People ↑↓
discipline
None ▼
office
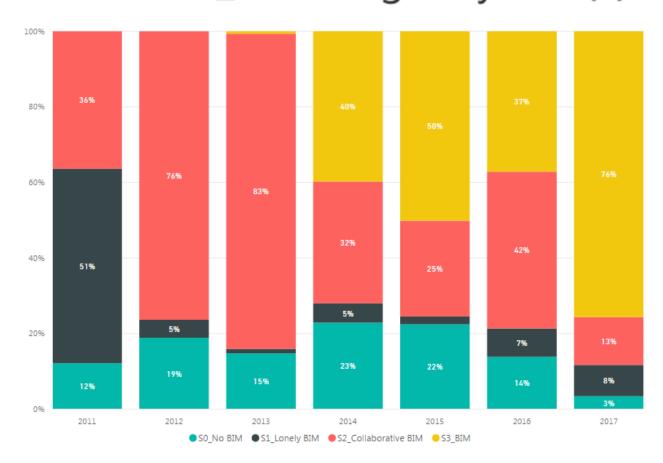All ▼

Links
☑ People-People
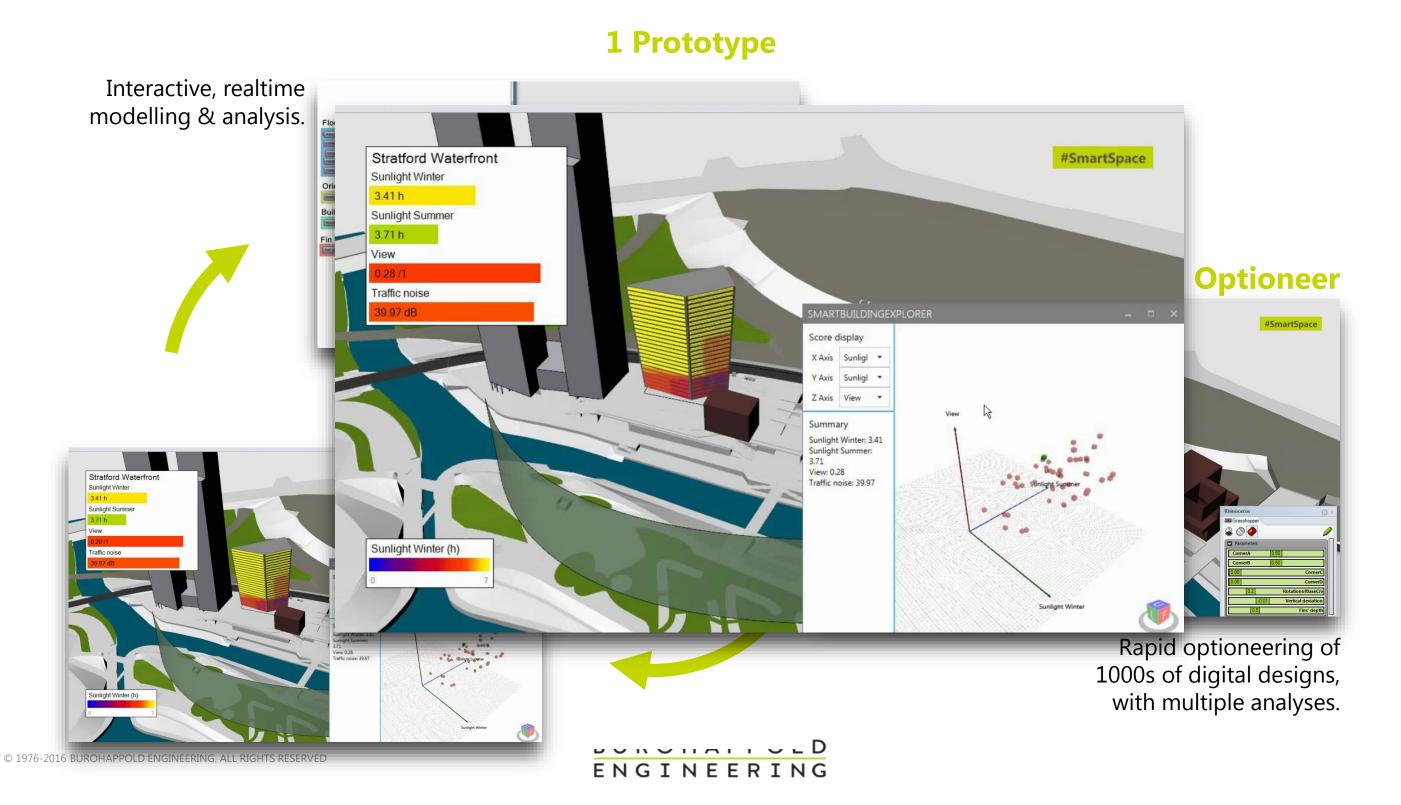☑ Code-Code
☑ Code-People

How do we build a good plan?

Summary

- Have a Plan – Make Mining Data Business AS Usual (BAU)

- Create a Change Project – Win Hearts and Minds

- Launch Initiatives around:

1) Data Policy

2) People

3) Process

4) Technology

- Measure and Track Progress

GLOBAL_ BIM Stages by Fee (£)

DECIDE WITH MACHINE AUGMENTED OPTIONEERING

1 Prototype

Interactive, realtime modelling & analysis.

Optioneer

Rapid optioneering of 1000s of digital designs, with multiple analyses.

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ENGINEERING

BuroHappold Engineering

making the vision viable

#digitally

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AUTODESK

Make anything.