AUTODESK UNIVERSITY

How to Data Mine Revit, ABC and ACC for Your Benefits



Mike Bartyzel & Jose Fandos
Global BIM Lead | @michaelbartyzel
Head of Product | @josefandos

Mike Bartyzel

- Global BIM Lead @ Buro Happold
- Leading Network of Regional BIM Leads
- CIBSE Digital Engineering Steering Group member
- Society of Digital Engineering Vice-Chair
- LRUG (London Revit User Group) organizer
- Responsible for BIM Strategy & Implementation
- Autodesk KRM



Jose Fandos

- Founder and Head of Product at Kinship.io
- CIBSE BIM Steering Group member
- CIBSE Product Data Templates Chair
- LRUG (London Revit User Group) raconteur



BUROHAPPOLD – ONE WORLDWIDE DESIGN COMMUNITY

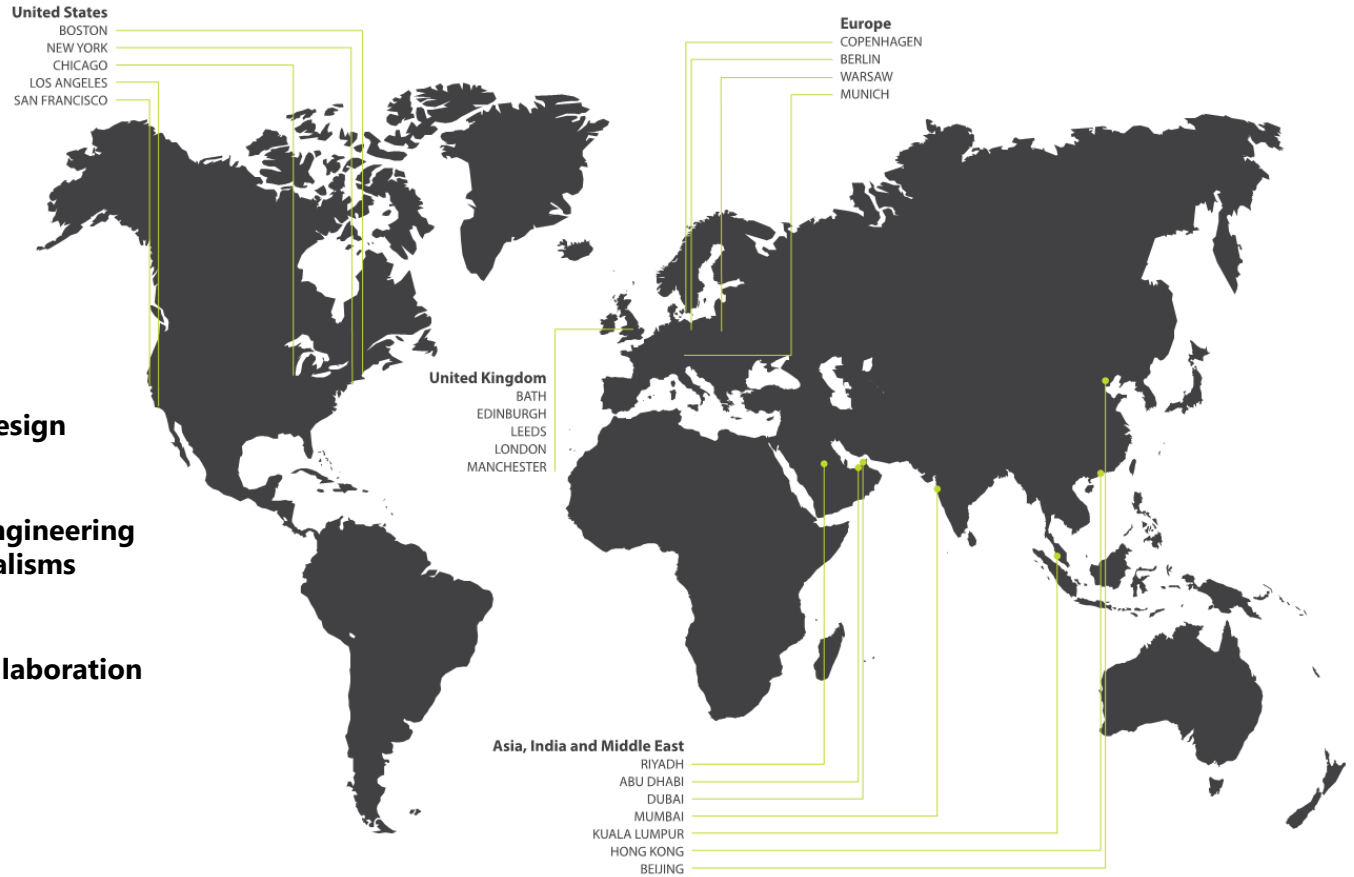
31 Office Locations

2500+ Staff

Pioneers in Digital Design

Covering all major Engineering disciplines and specialisms

Operating in One Collaboration Space



We are world-class at BIM and Digital



- **Museum of the Future**

Bespoke in-house optimization modelling

3D energy model in which all 12 disciplines interacted in real-time, with over 50 sustainable design decisions



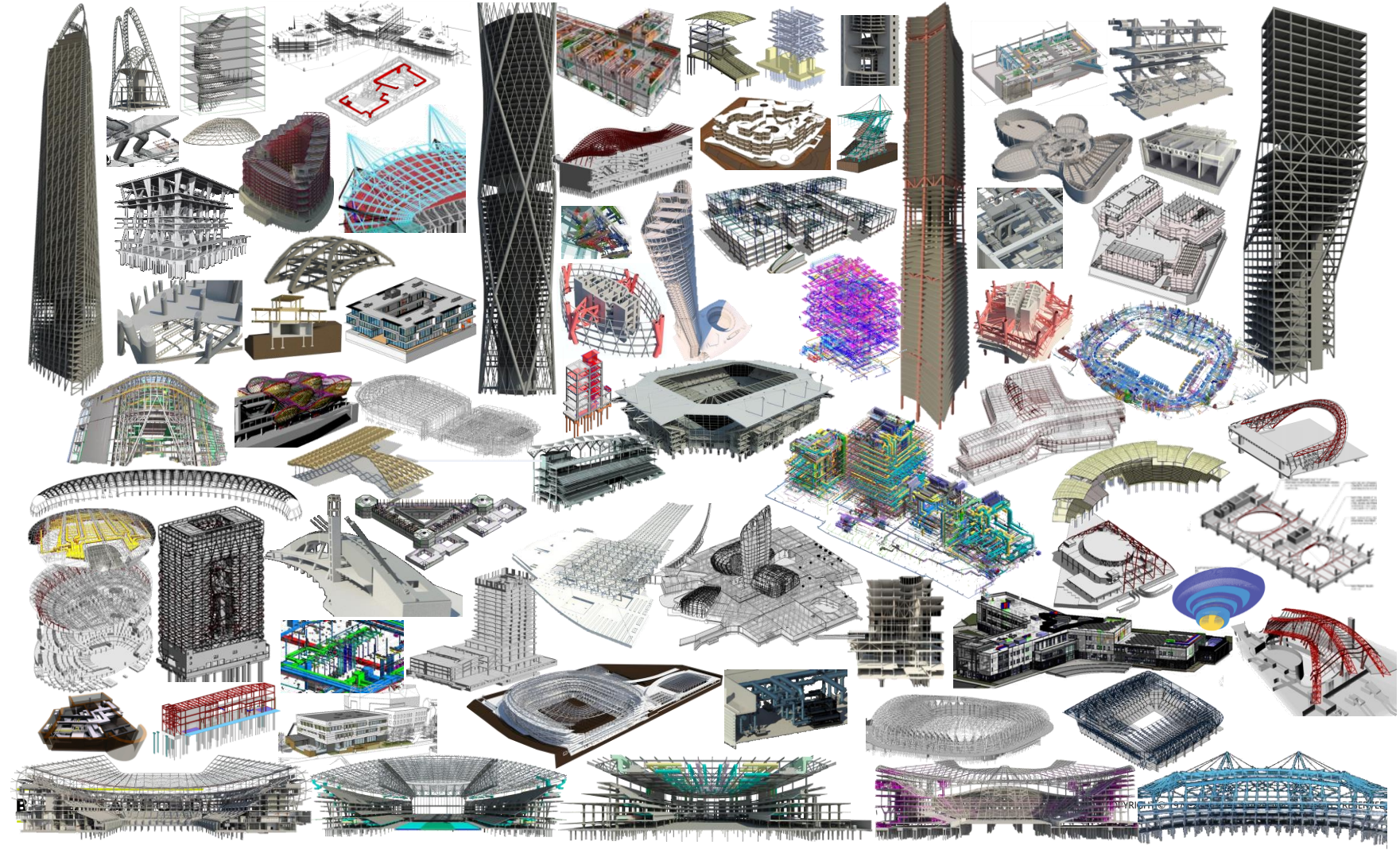
- **The Jewel (*tallest indoor waterfall in the world*)**

Used advanced BIM technology to optimize design that was beautiful, buildable and affordable



- **Academy Museum of Motion Picture**

A building of this complexity relied on advanced BIM technologies to coordinate designs, optimize engineering solutions, and define methodologies



Industry Recognition

CHARTERED INSTITUTE OF BUILDING SERVICES ENGINEERS (CIBSE) AWARDS

Building Performance Consultancy of the Year (over 1,000 employees) 5 times in a row!



CIBSE SOCIETY OF DIGITAL ENGINEERING AWARDS

Best Digital Engineering Consultancy

Best Innovation Award

Best Digital Engineer

Best Project



BURO HAPPOLD

A journey of better outcomes for clients, the planet, and the teams (...and reduced risks + higher profit shared)



31
OFFICES

450+
ACTIVE PROJECTS

2175+
MODELS IN THE CLOUD

10.5M
SYNCS/YEAR



Everything you need to manage your content, projects and team in Revit.

Product overview



For Teams Working in Revit

Best-in-class tool for the most widely used BIM package



Content Management

Put the right content at your team's fingertips



Project Tracking

See what's happening in all your projects and models



Analytics

Learn what's working, where to focus and how to improve

What sets Kinship apart?



Easy

Simple interface, easy to deploy, minimal setup and administration



Instant

Capture data in real time and have it available when/where you need



Intelligent

Use context and history to save time and make better decisions



Integrated

Bring together your content, project data and team all in one place


BUROHAPPOLD
ENGINEERING

Foster + Partners

SAR+

COX

Veev

BIG

LITTLE
DIVERSIFIED ARCHITECTURAL CONSULTING

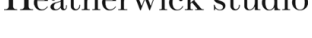
Billard Leece
Partnership

progressive ae

tp bennett

LEIGHTON

TR
CB.

FALK
BUILT

Heatherwick studio

PASCALL
+WATSON

WilkinsonEyre

STANTON
WILLIAMS
KIERAN TIMBERLAKE

architectus

BVN

bimco

SWECO

wood.

MJMA

kasian

NEUF
ARCHITECT(E)S

BDP.

RRMM
ARCHITECTS

Pollard
Thomas
Edwards

Hopkins Architects

Nickl & Partner

DELV
DESIGN

AFRY

OMICRON

OTJ

LAND

MASS.

assar
inclusive architecture

Countries
15+

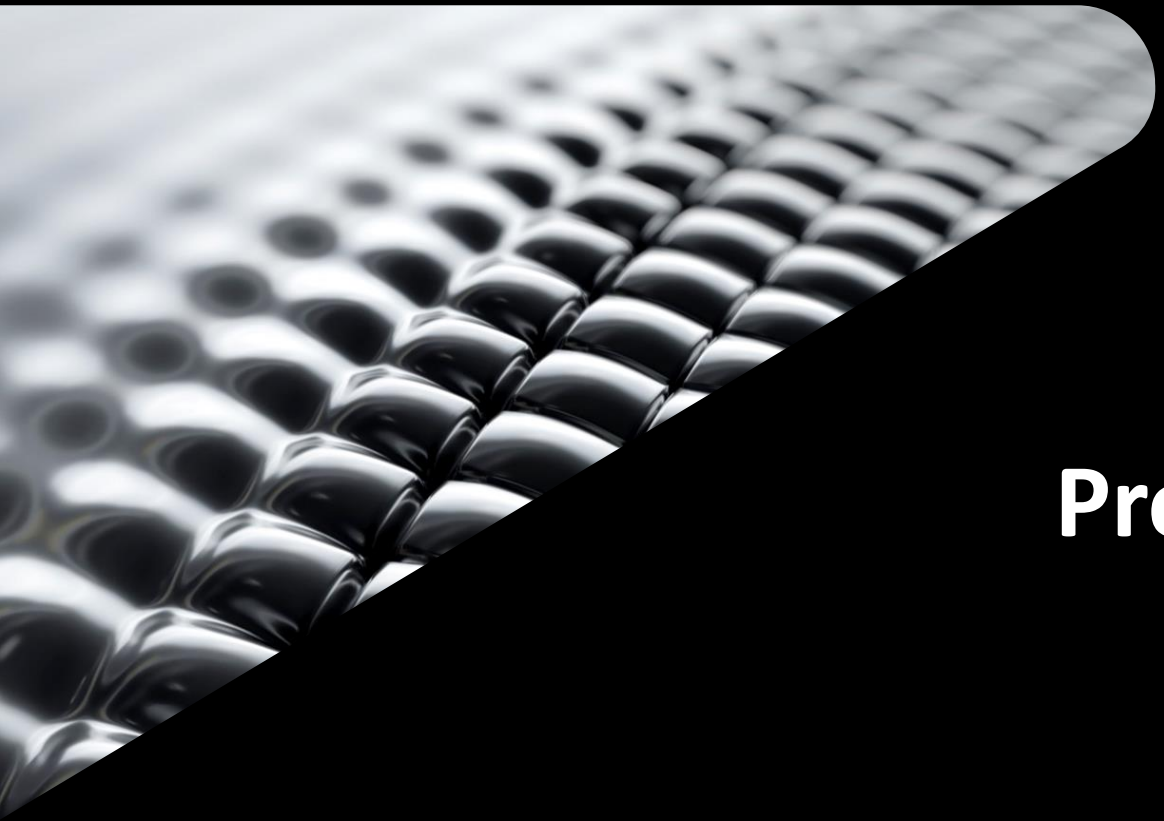
Firms
100+

Users
13k+

Models
70k+

Searches
500k+

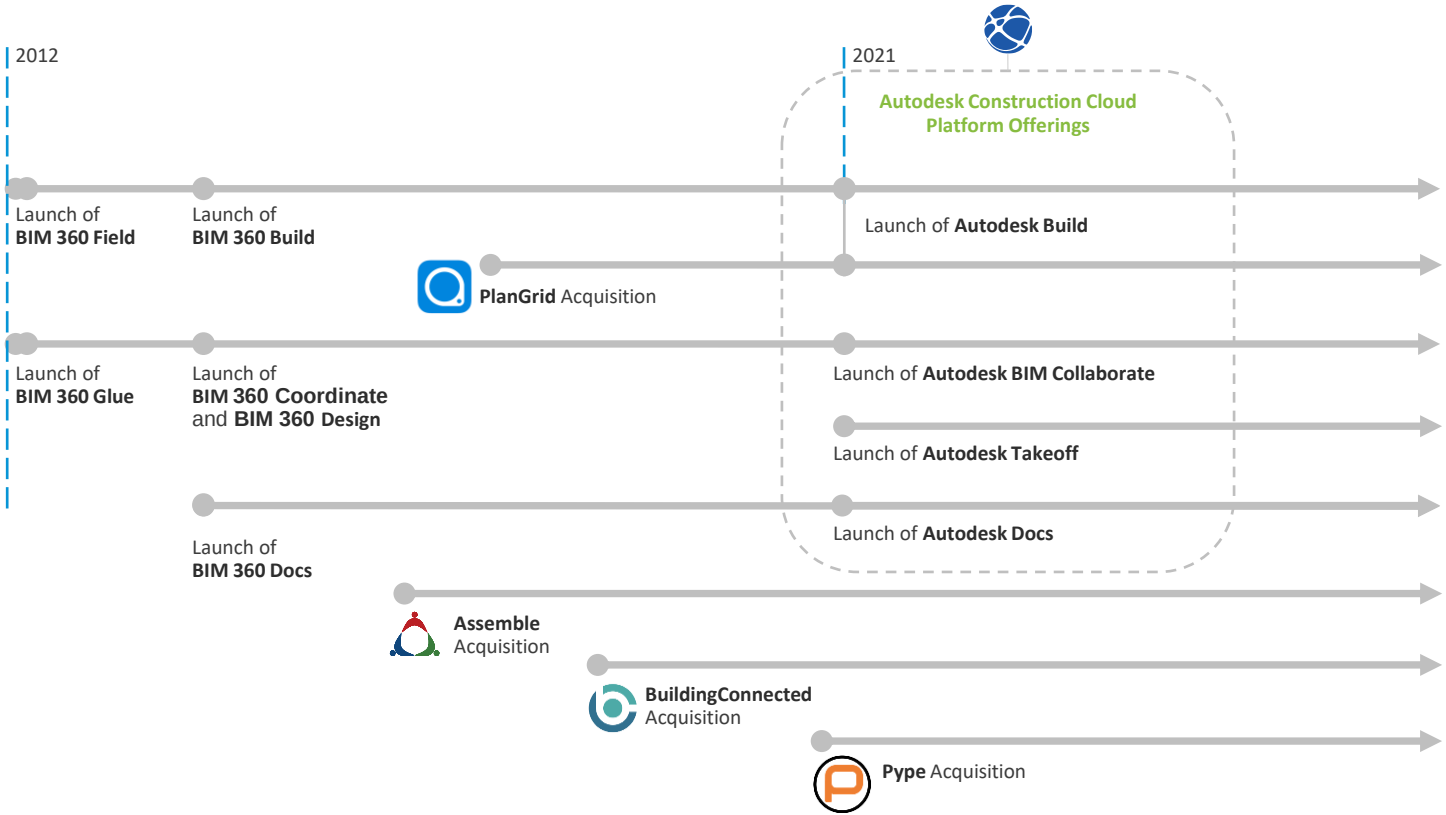
Content
23m+

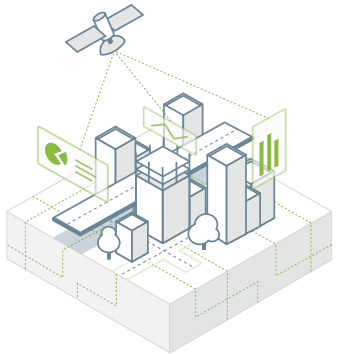


Product Evolution

Autodesk Construction Cloud Timeline

High Level Evolution



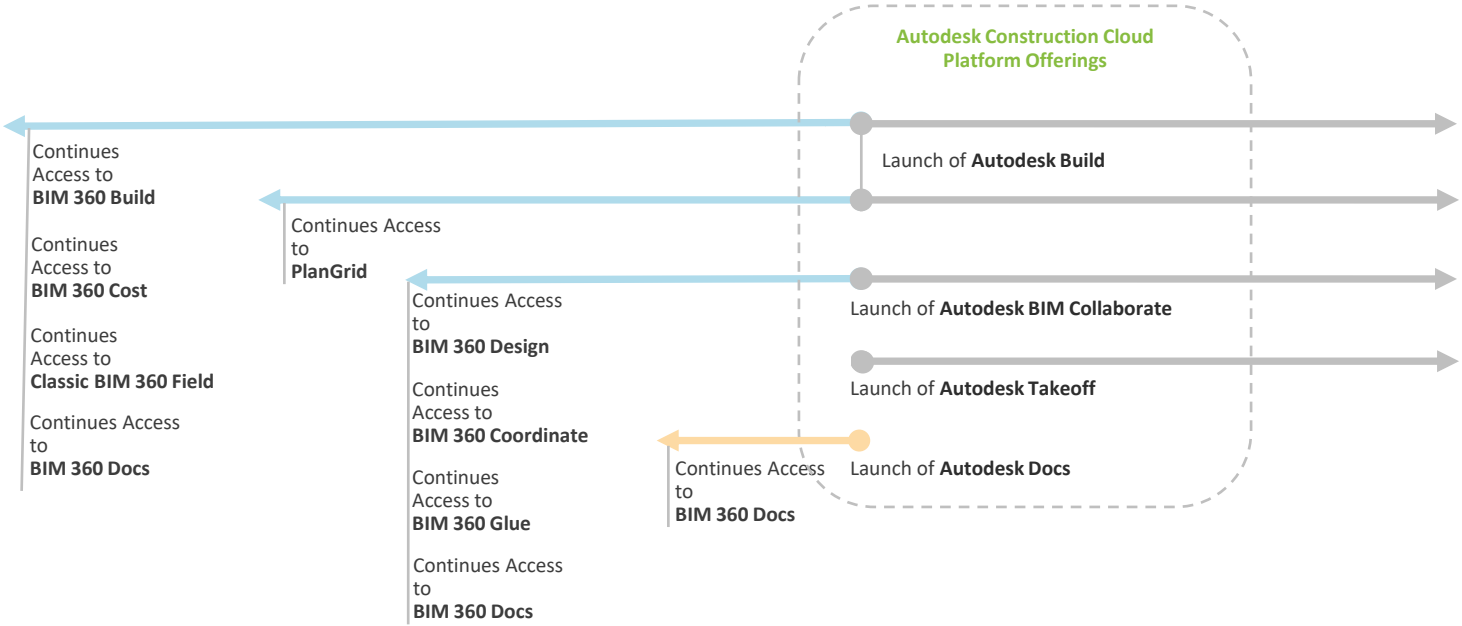


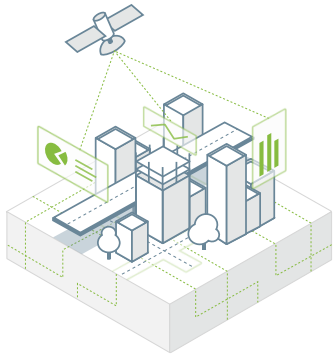
Unification

build a unified platform where all champion features come together under a single log-in for seamless adoption of features across the full digital building lifecycle

Autodesk Construction Cloud Timeline

Continues Access to Core Products



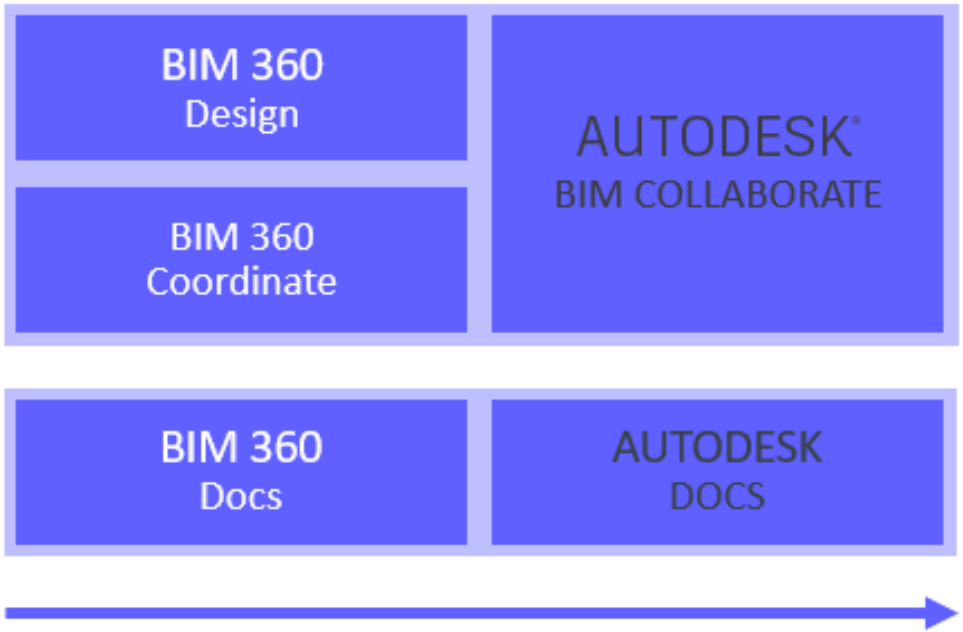


Unification

build a unified platform where all champion features come together under a single log-in for seamless adoption of features across the full digital building lifecycle

Autodesk Construction Cloud

Fairly Recent Product Name changes



Autodesk Construction Cloud | Product Mapping

Product Name	Capabilities / Features	ACC Product Name	Capabilities / Features	Notes
INSIGHT				Combined insight from both BIM 360 & ACC projects.
ADMINISTRATION				Combined project administration
BIM 360 Design	Design Collaboration Revit Cloud Work-sharing Collaboration for Civil 3D & Plant 3D	**Autodesk BIM Collaborate PRO**	• **Collaboration for Civil 3D & Plant 3D** • **Revit Cloud Work-sharing** • Design Collaboration • Automated Clash Detection • Aggregated Model Coordination • Issue Management	PRO includes access to the collaboration and work-sharing tools for Revit, Plant 3D and Civil 3D.
BIM 360 Coordinate	Automated Clash Detection Aggregated Model Coordination Issue Management	**Autodesk BIM Collaborate**		
BIM 360 Build	Project Management Field Management Safety Management Reporting & Analytics	**Autodesk Build**	• Project Management • Field Management • Safety Management • Quality Control • Schedule • Cost Management • Budget Control • Change Management • Pay Applications • Project Closeout • Reporting & Analytics	Capabilities from both BIM 360 Build and Cost, together with the best of PlanGrid
BIM 360 Cost	Cost Management Budget Control Change Management Pay Applications			
PlanGrid	Project Management Field Management Safety Management			
BIM 360 Docs	Document Management / CDE Version / Change Management Approvals / Design Reviews Metadata Management	**Autodesk Docs**	• Document Management / CDE • Version / Change Management • Approvals / Design Reviews • Metadata Management	Autodesk Docs is included in all the products
N/A		**Autodesk Takeoff**	• Scope Analysis • 2D Takeoff • 3D Takeoff	New 2D and 3D quantification tool

AUTODESK CONSTRUCTION CLOUD™

AUTODESK **BIM COLLABORATE** | AUTODESK **TAKEOFF** | AUTODESK **BUILD**

Capabilities	Design Collaboration	Coordination	Quantification	Project Management	Cost Management	Quality	Safety	Project Handover
Workflows	• Constructability Review • Change Visualization • Revit Cloud Worksharing • Collaboration for Civil 3D / Plant 3D	• Model Coordination • Constructability Review	• Scope Analysis • 2D/3D Takeoff	• RFIs • Submittals • Meeting Minutes • Daily Reports • Schedule • Progress Tracking (public beta)	• Contract Creation / Administration • Change Orders • Payment Applications • Forecasting	• Quality Planning • Quality Checking • Punchlists • Issue Management	• Safety Planning • Safety Training • Safety Observations • Safety Inspections	• Commissioning • Turnover Documentation • Final Completion • As-Built Survey
	Document Management	Document Control · Document Versioning · Document Approvals · Naming Standards						
Unified Data		Models · Drawings · Documents · Cost Items · Assets · As-Builts · Photos · Videos						
Insight		Dashboards · Reports · Construction IQ · Data Connector						
Admin		Admin Console · Permissions · Project Setup · Templates · Notifications						

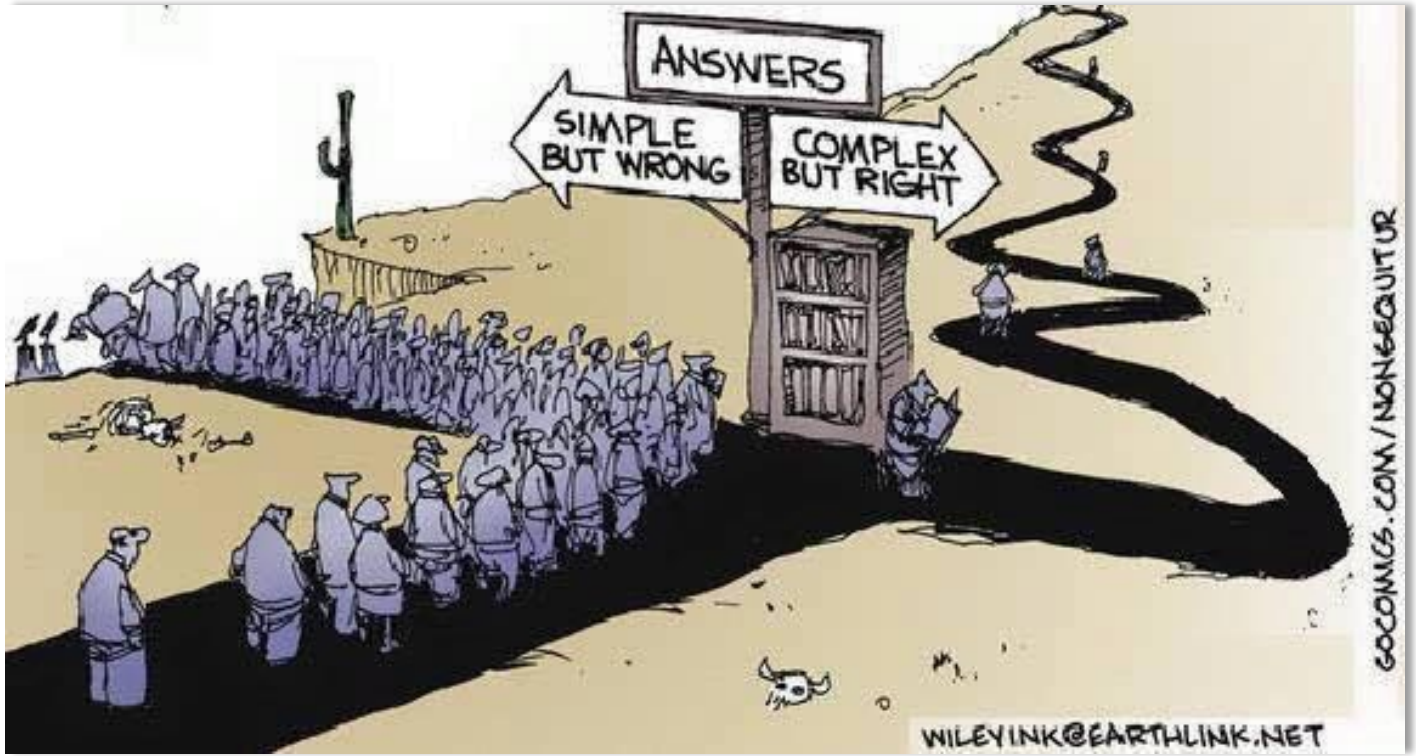
Autodesk Construction Cloud

Confused?




Others Struggle
The Built Environment
New innovations

We try to do it the right way



The Only Constant is Data

- We believe in the power of Data. These are some of the internal and external tools that we are using:
  - BIM Radar
  - Power BI
  - CQFlexMon Software Usage Tool
  - Kinship
  - Internal Scripting Tools



Buro Happold BIM Stages – our BIM Policy



Stage 0:
We're not using BIM



Stage 1:
3D Modelling/Document Based CDE Collaboration



Stage 2:
Object Based Modelling/Model Based CDE Collaboration/Data as a Deliverable



Stage 3:
Object Based Modelling/Network Based Integration/Data as a Consumable

Categories	Subject	Stage 0	Stage 1	Stage 2	Stage 3
Model Type	2D	Required	Required	Required	Required
	3D	Recommended	Required	Required	Required
	Object Based	N/A	Recommended	Required	Required
Contractual Requirements	BIM Stages recorded in CRM	Required	Required	Required	Required
	Contractual Requirement to Deliver BIM	N/A	N/A	Recommended	Required
Documentation	BIM Accounted for in Project Execution Plan (PEP)	N/A	Required	Required	Required
	Internal BIM Execution Plan (iBEP)	N/A	Required	Required	Required
	Model Production & Delivery Table (MPDT)	N/A	Recommended	Required	Required
	BIM Execution Plan (BEP) (External Requirement)	N/A	Recommended	Required	Required
	BIM QA Checklist	N/A	Recommended	Required	Required
	Data Quality Assurance Plan (Data QA Plan)	N/A	Recommended	Recommended	Required
	Employers Information Requirements (EIR) (External Requirement)	N/A	N/A	Required	Required
Roles and BIM QA Responsibilities	Regional BIM Lead (RBL)	N/A	Required	Required	Required
	Project BIM Lead (BIML)	N/A	Required	Required	Required
	Discipline BIM Coordinator (BIMC)	N/A	Recommended	Required	Required
	Information Manager (IM) (External Requirement)	N/A	N/A	Required	Required
Collaborative Environment	Internal Model Interoperability	N/A	Required	Required	Required
	Use of a formal CDE	N/A	Recommended	Required	Required
	Internal Live Model Collaboration	N/A	Recommended	Required	Required
	External Model Interoperability	N/A	N/A	Required	Required
	External Live Model Collaboration	N/A	N/A	Recommended	Recommended
Team Engagement	BIM Kick-Off Meetings	N/A	Required	Required	Required
	BIM Strategy Meetings	N/A	Recommended	Required	Required
	BIM Coordination Meetings	N/A	Recommended	Required	Required
	End of stage BIM Review	N/A	Recommended	Required	Required
Deliverables Format	2D Files and Documents	Required	Required	Required	Required
	3D Models	N/A	N/A	Recommended	Required
	Data Extracted from Models	N/A	N/A	Recommended	Required
	Data Embedded in Models	N/A	N/A	N/A	Required

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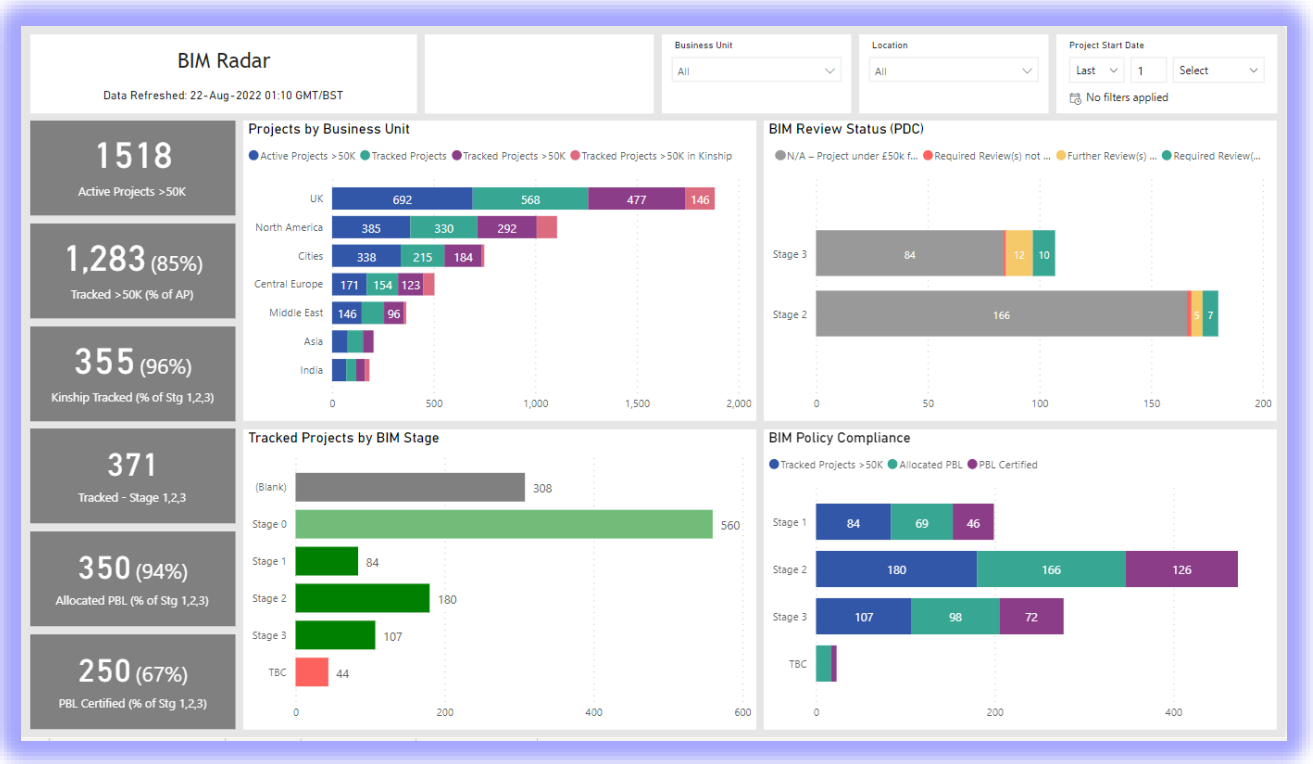
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What is BIM Radar?

- Our own BH unique tool
- Updates daily
- First tool to look up ahead at risks on the projects
- It draws data from 4 sources:

1. Deltek
2. Kinship
3. BIM Trackers
4. ACC

- Measuring Top 5 Risk Points
- Access is open to all



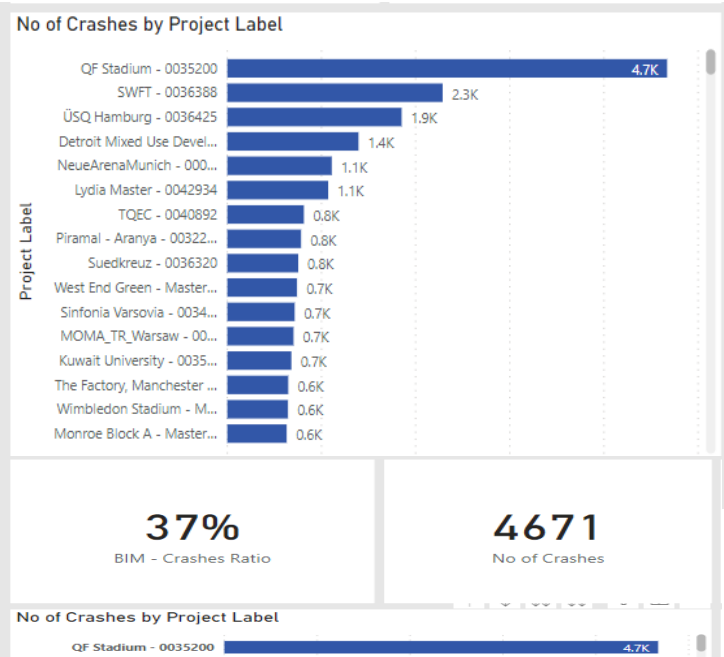
BIM Radar Benefits



- Acts as an early warning for Project Leads – de risking our key deliverable information
- Tracked parameters include Model Size, Family Size, Crashes, Family Naming, Warnings Score
- Highlights potential problems even before they fully develop on the project
- Promotes better project planning with open nature and comparisons between the projects
- Encourages consistency and higher quality on our projects
- Groups projects in easy to understand Traffic Lights banding

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BIM Radar Benefits



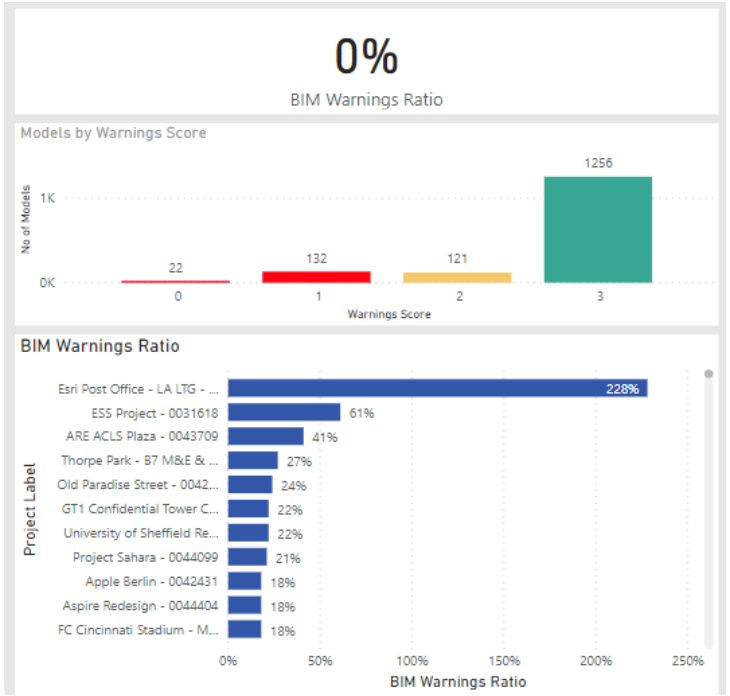
- Delivers daily health insights for projects – data is refreshed every 24 hours
- Provides business intelligence through data interrogation
- Complementary to the Discipline Dashboards
- Reduces the risk of crashes to the models
- Offers historical insights for lessons learnt and benchmarking

Project	File Name	Last Synced	Rvt Version	Model size (MB)	BIM warnings	BIM elements	No of Crashes	Crashes Ratio
0035200 - QF Stadium	C05-JPQ-M-STA-C-FP-AL-AZ-0000.RVT	26/09/2019	2017	100.13	0	73327	258	1.53
0035200 - QF Stadium	C05-JPQ-M-STA-C-ME-AL-AZ-0000.RVT	04/09/2019	2017	300.61	0	81595	1613	5.39
0035200 - QF Stadium	C05-JPQ-M-CAC-C-AD-AL-AZ-0000.RVT	01/08/2019	2017	219.92	0	20569	361	0.9
0035200 - QF Stadium	C05-JPQ-M-STA-C-CT-AL-AZ-0000.RVT	26/07/2019	2017	308.05	0	30650	357	1.79
0035200 - QF Stadium	C05-JPQ-M-STA-C-ME-AL-AZ-0001.RVT	23/06/2019	2017	73.64	0	13134	323	1.24

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BIM Radar Benefits

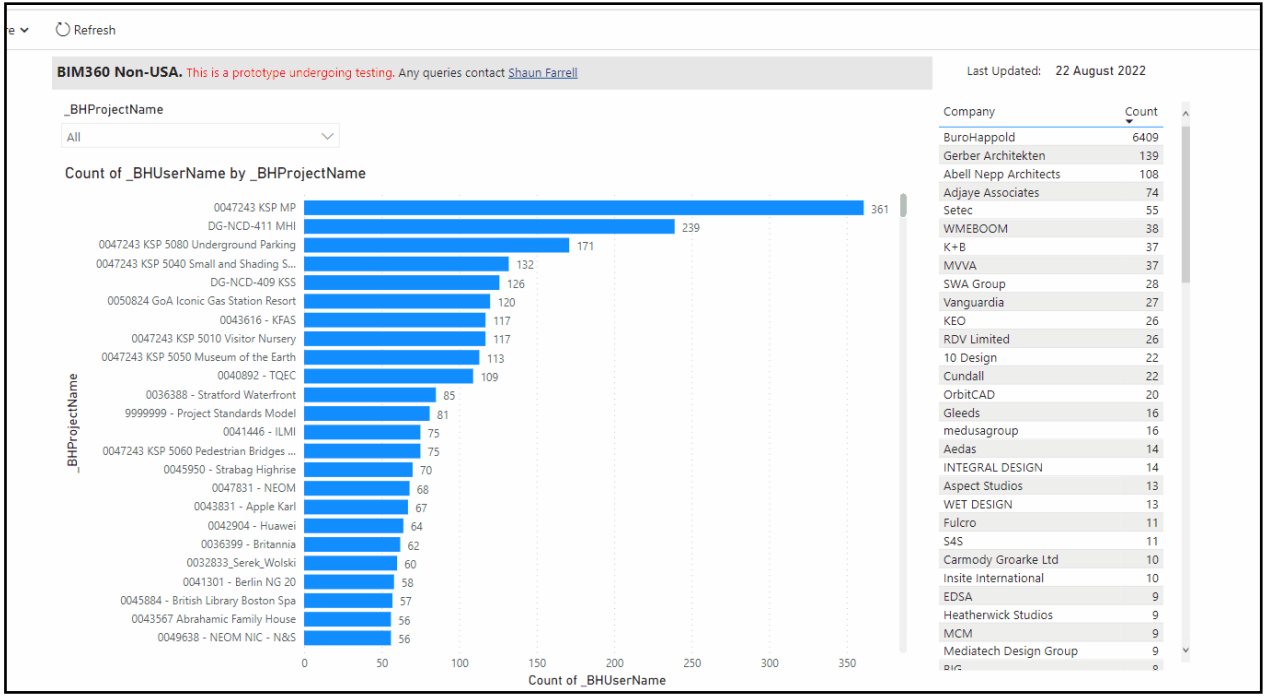
- Decreases the amount of abortive work
- Cuts time needed for interrogation of problems
- Pinpoints even on the model level to the sources of errors
- Very easy to build on in the future
- Easy to quantify monetary benefit - there are several examples from the past of time lost where this tool would have prevented extensive problems - from accessing the models to frequent crashes – it took 2 weeks to fix one project with 50 people experiencing severe delays



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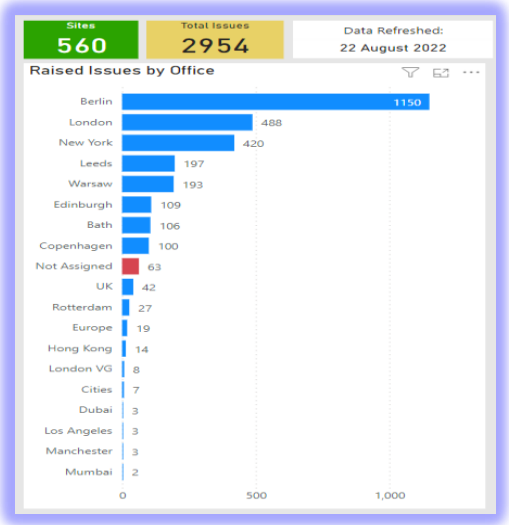
ACC Power BI Dashboards

- We initially used the Autodesk Templates
- Updates weekly
- Gives us the best usage insights
- We can see who the project members are, and the offices sharing the project
- We can quickly identify projects needing backup
- Great to see the licences usage and the actual use case adoption



ACC Power BI Dashboards

- Use Cases have their own ROI
- Each one has a priory for the implementation
- It is easy to calculate the savings once you have the usage data



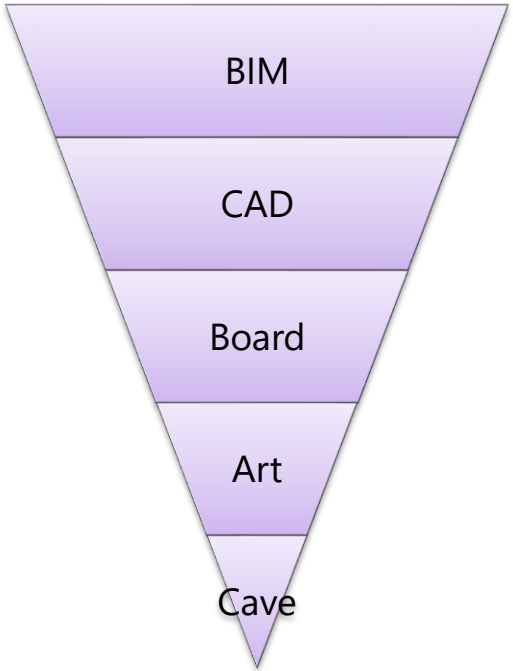
Use Case	Status Feb 2021	Priority	ROI Mechanism
Model Sharing	**Embedded**	Very High	Speed up model Synchronisation
BIM 360 Docs - Buildings	**Embedded**	High	Saved time on upload/download/opening of model in viewer
BIM 360 – Cities (Docs + Sharing)	**Pilot**	High	Saved time on upload/download/opening of model in viewer
Design Coordination	**Available**	High	Faster resolution of design coordination issues
RFI/Issue Management	**Embedded**	High	Easier issue communication leads to quicker RFI closure

Reporting & Dashboards

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Evolution, revolution as innovation?



Late 20th and now 21st

Mid 20th and now 21st

Early 18th and still in the 21st

Early 10K BC and still in 21st

Early 35K BC and still in 21st

37,000 Years

How far have we really progressed in the actual activity? Digitisation vs Digitalisation?

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Two methods of organising information







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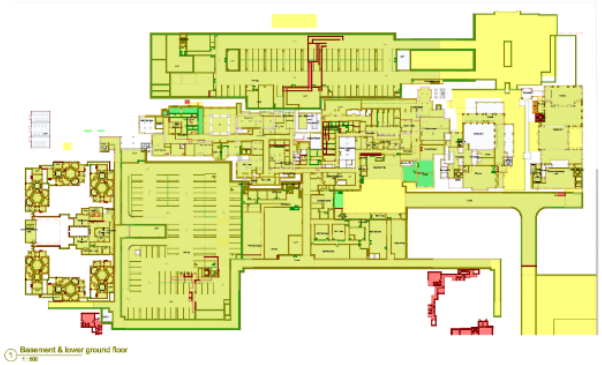
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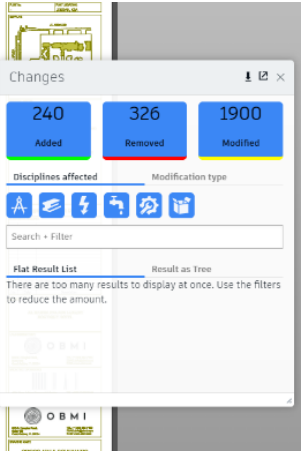
Reporting & Dashboards

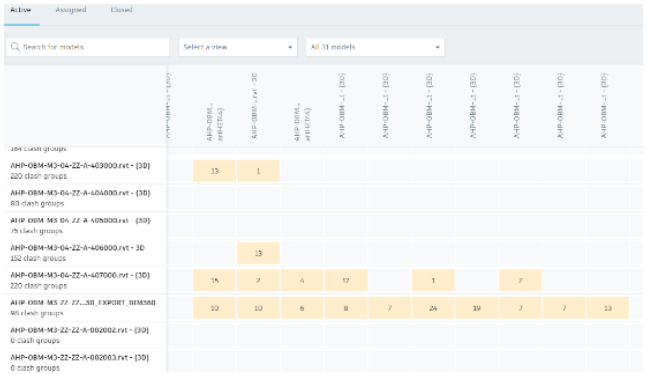
Onboarding Reporting
- Number onboarded
- Documents Distributed
- Key members

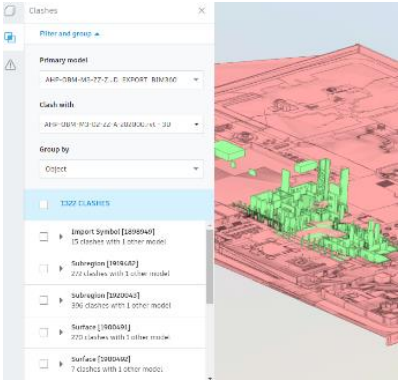
Model Checking
- Quality and coordination.
- Level of Information Need
- Data Validation
- Area Schedule analysis
- Progress
- Changes

Information Delivery
- Information Exchanges
- Milestone Deliverables Completeness
- Overview of all activities through the CDE.
- Design Progression









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Reporting & Dashboards

Onboarding Reporting
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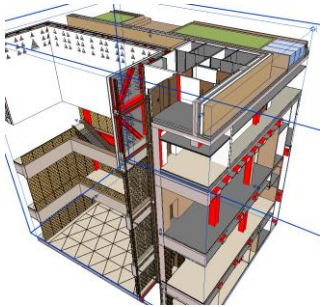
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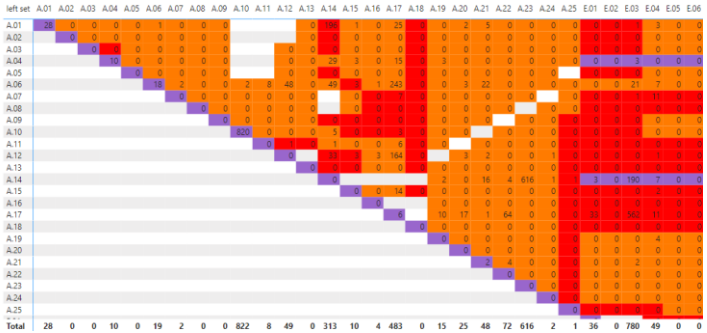
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Clash detection analysis

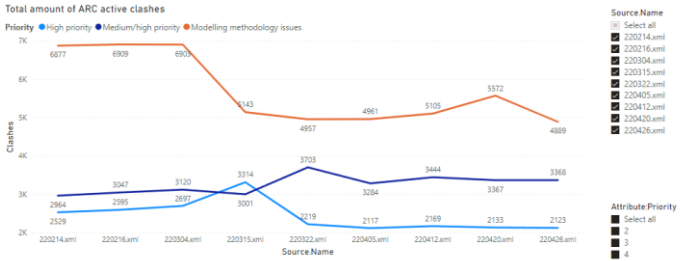
From cloud data to data analysis



Clash test Name	Attribute:test_type	Test Priority	Lastest clash
A.06 - A.17 Floors vs Walls	hard	2	2908
A.17 - S.06 Walls vs Structural Framing	hard	2	2155
A.17 - M.08 Walls vs Ducts	hard	3	2079
A.17 - P.08 Walls vs Pipes	hard	3	1770
A.17 - S.03 Walls vs Structural Columns	hard	2	1038
A.17 - E.03 Walls vs Cable Trays	hard	3	1003
A.06 - P.08 Floors vs Pipes	hard	1	736
A.06 - S.03 Floors vs Structural Columns	hard	2	703
M.08 - S.06 Ducts vs Structural Framing	hard	3	669
A.12 - A.17 Roofs vs Walls	hard	2	359
P.08 - S.06 Pipes vs Structural Framing	hard	3	316
E.03 - M.08 Cable Trays vs Ducts	hard	3	307
M.08 - P.08 Ducts vs Pipes	hard	3	287
E.03 - S.06 Cable Trays vs Structural Framing	hard	3	267
A.17 - M.03 Walls vs Duct Fittings	hard	3	229
A.06 - M.08 Floors vs Ducts	hard	3	218





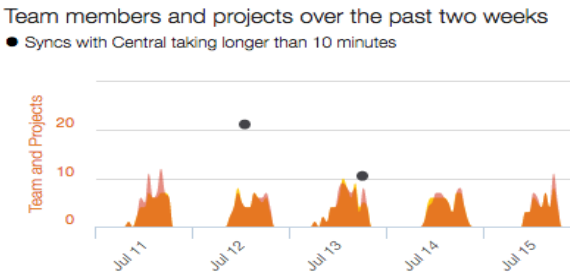


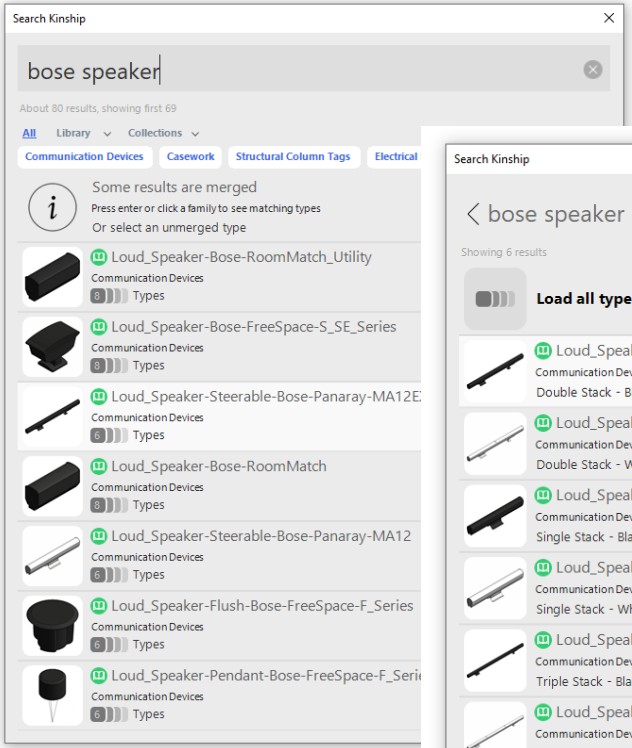
Clash priority analysis from 1 (ignored) to 4 (high priority) over time

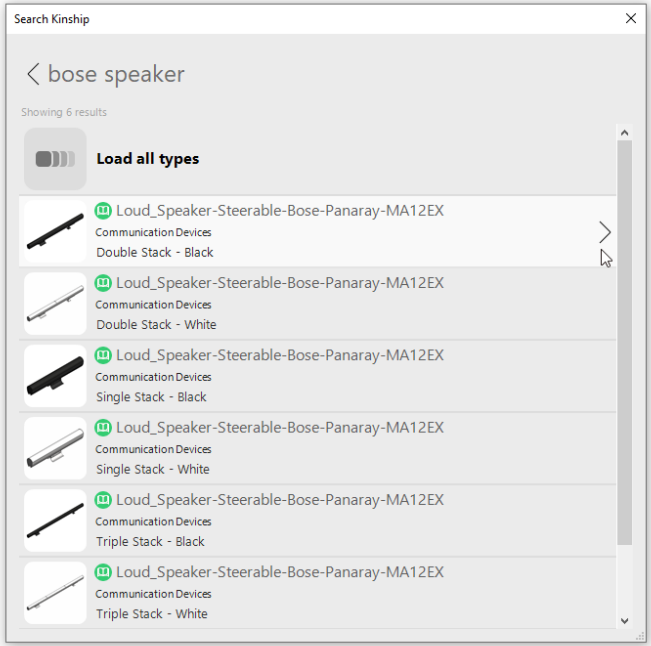
DEPLOYING BIM ANALYTICS

Kinship

- Better Content and Projects
- Insight into Your Data
- Over 1500 Users in BH
- Every Revit Project Tracked
- Project Health Insights



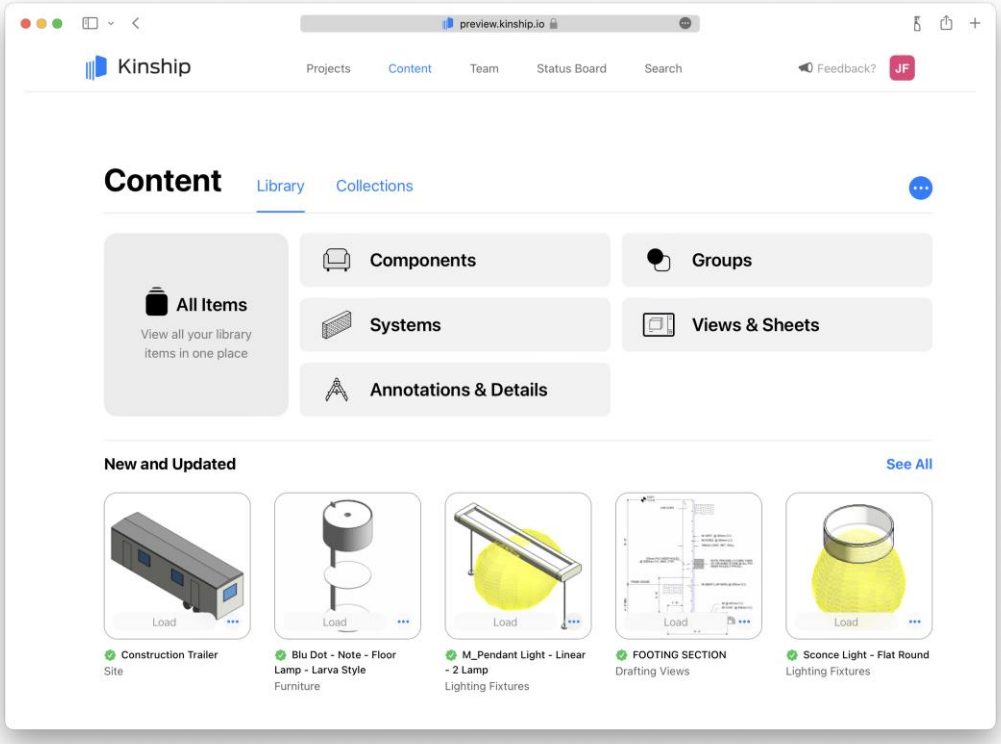




DEPLOYING BIM ANALYTICS

Kinship

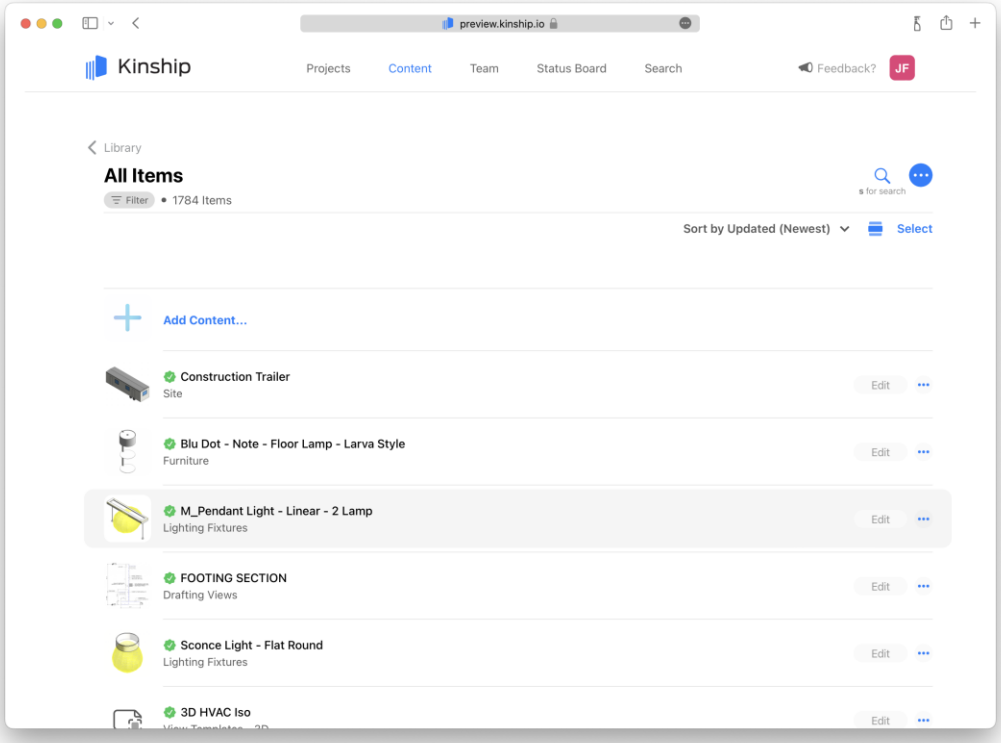
- Better Content and Projects
- Insight into Your Data
- Over 1500 Users in BH
- Every Revit Project Tracked
- Project Health Insights



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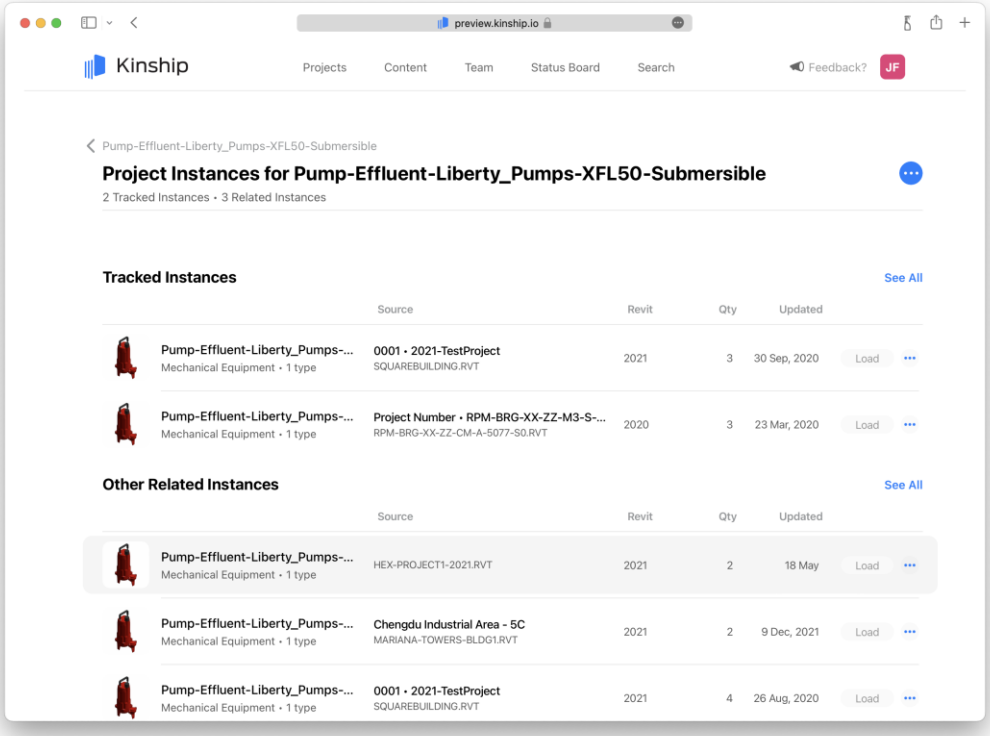
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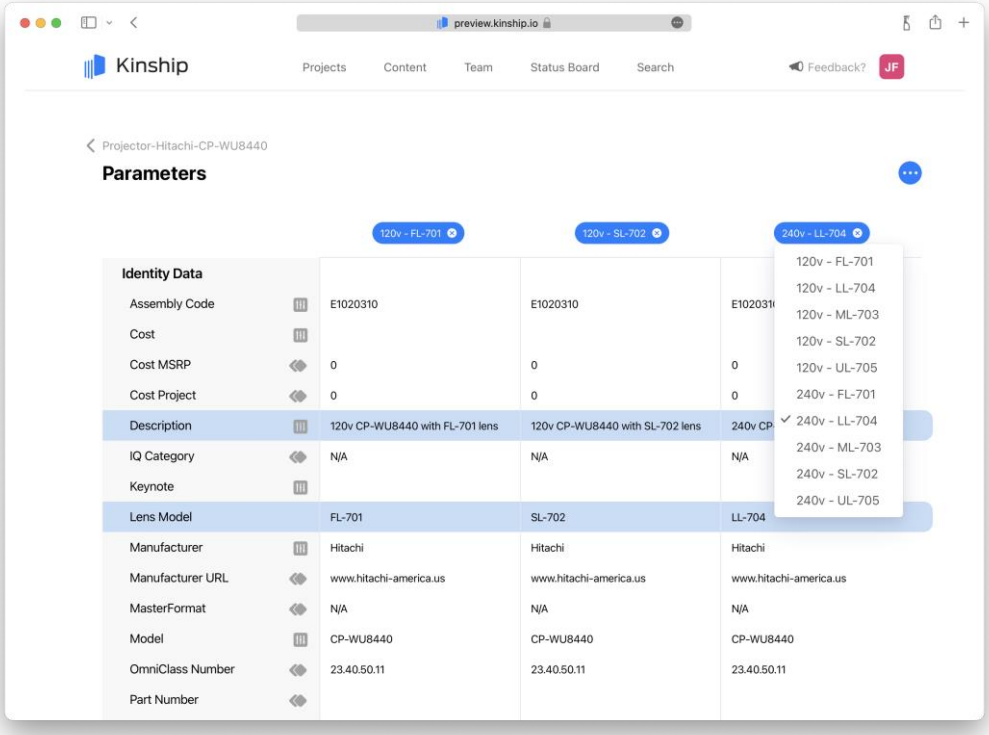
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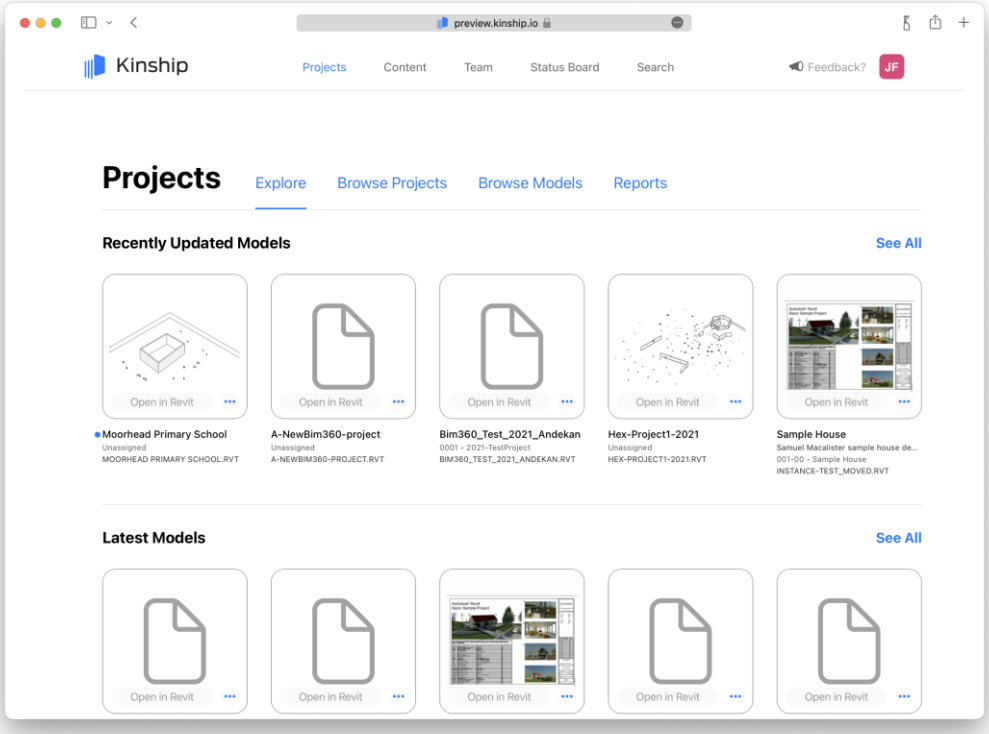
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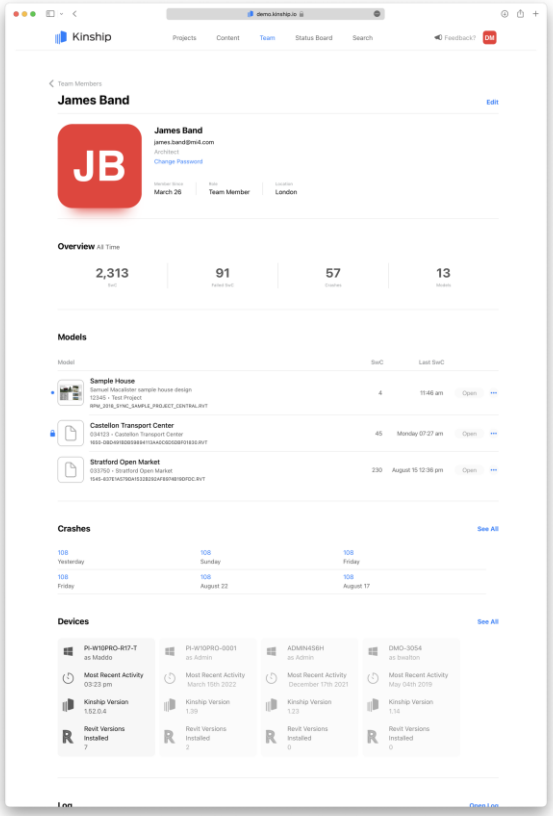
Kinship

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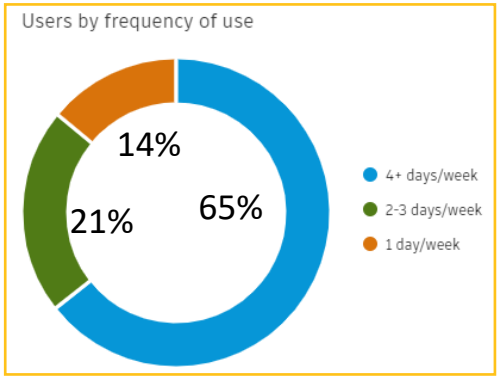
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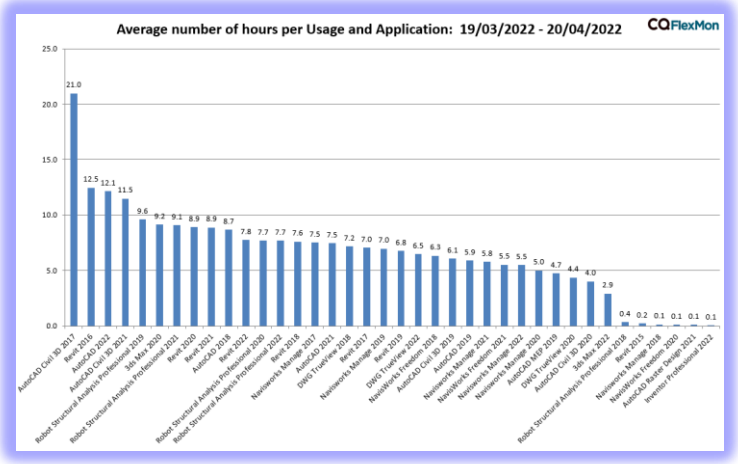
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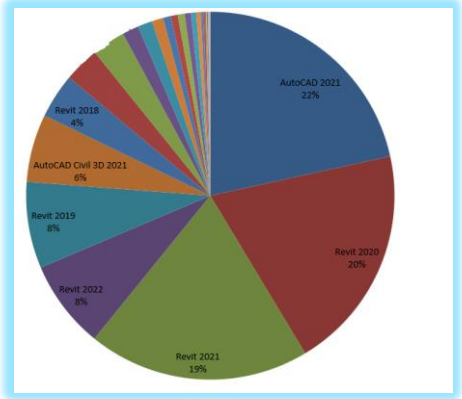


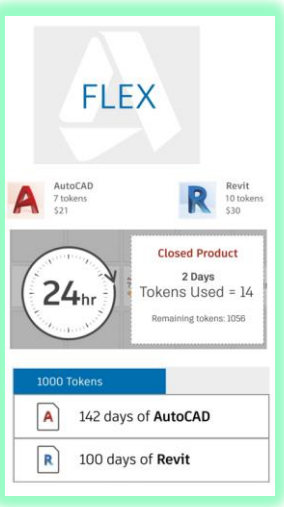
CQFlexMon Software Usage Tool

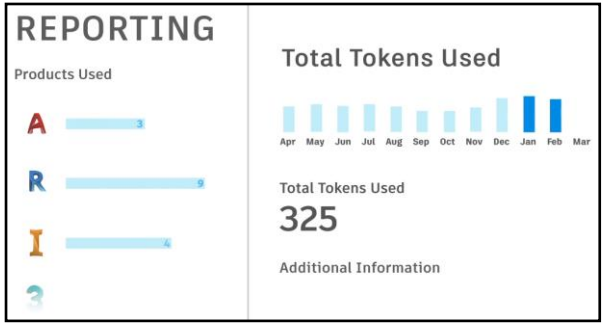
- This tool is a must to determine the software usage
- Live Data
- Main software to help with deciding if to go with the long-term licences or Flex Licences











Autodesk Construction Cloud Benefits



Centralized Access

Our teams can seamlessly access model data at a central location



Integrated Project Delivery

We are moving towards a common data environment



Collaboration with external teams

Revit Server brings complexities- Access/ Firewalls/ Security



Data Exchange

Exploring more efficient workflows



Return On Investment

We see fivefold return on our Investment



Buro Happold

making the vision viable

#digitally

follow @burohappold





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