CS319274

Data Integrations for a Construction Project

Liang Gong Clayco

Tomislav Zigo Clayco

Learning Objectives

- Learn how to process takeoffs, version comparisons, and asset management in Assemble and BIM 360
- Learn how to generate model-based schedules in Assemble Schedule Integrator
- Learn how to manage clashes via BIMTrack
- Learn how to mine data and visualize multiple data sets via Power BI

Description

This presentation will revolve around a large industrial project to demonstrate the data workflow from design through construction, as well as the site data gathering for data visualization. By using the following software platforms—BIM 360 software, Assemble, BIM Track, Primavera P6, and Microsoft Power BI—the information from this project's different components is visualized and combined in Power BI. Dax and M language in Power BI are utilized to manipulate raw data. Metric-based results in Power BI dashboards are organized tab by tab in accordance with different analytical functionality. We'll give detailed examples to represent the information cross-referencing between the disciplines. This presentation will help different stakeholders track the progress of projects from qualitative and quantitative perspectives based on locations.

Speaker(s)

Tomislav Zigo

Over the past two decades Tomislav has been an advocate of digital technology implementation as a researcher, designer and over past six years as a designer - builder. His experience includes work in the vanguard of BIM methodology implementation on large healthcare, institutional and industrial projects; research work in the field of Building Performance Analysis; optimization and use of mobile and immersive technology and mentorship positions in a number of local and national architectural firms during their transition toward BIM adoption. Currently he leads Clayco's VDC department and teaches at Washington University in St. Louis.

Liang Gong

Liang works as a VDC Senior Data Manager at Clayco. Liang works directly with the company's preconstruction/estimating department and VDC to develop accurate detailed project takeoffs and utilizes various programs to assist with other aspects of our business as needed including

project management, BIM development and coordination, 3 dimensional detail production, 5D development and earned value analysis protocols. Liang develops data analysis standards, works closely with project teams in solving problems through the use of digital production tools, and bridges the gap between the data captured in the field and project aspirations. Liang owns the data aggregation process and works as managing liaison between software manufacturers and internal development team. Liang got his Master of Engineering Management degree from Duke University and Bachelor in Civil Engineering degree from Tianjin University, China.

Data Integrations for a Construction Project





Tomislav Zigo -Vice President, VDC Clayco inc.

About the speaker

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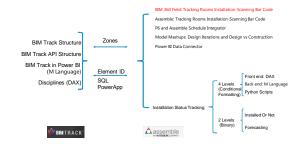
LIANG GONG -VDC Senior Data Manage Clayco

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To think as a VDC engineer



BIM 360 Field: Tracking Rooms Installation-Scanning Bar Code



BIM 360 Field: Tracking Rooms Installation-Scanning Bar Code

Question 1: How to integrate Barcodes into Revit?

Question 2: How to stand in center of a room when using "Show in Model"? (Out of a surprise)



BIM 360 Field: Tracking Rooms Installation-Scanning Bar Code

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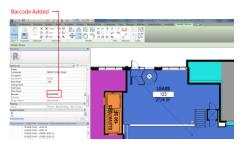
Read from Revit and write to Excel – To grasp all the room information



BIM 360 Field: Tracking Rooms Installation-Scanning Bar Code



BIM 360 Field: Tracking Rooms Installation-Scanning Bar Code

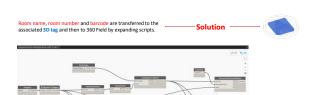


Question 2: How to stand in center of a room when using "Show in Model"?





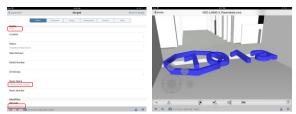
Where is the room?
The room is hidden by a wall or floor



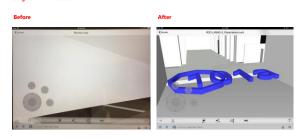
BIM 360 Field: Tracking Rooms Installation-Scanning Bar Code



Question 2: How to stand in center of a room when using "Show in Model"?

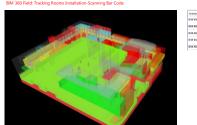


Question 2: How to stand in center of a room when using "Show in Model"?



BIM 360 Field: Tracking Rooms Installation-Scanning Bar Code





BIM Track Structure
BIM Track in Power BI
(M Language)
Disciplines (DAX)

SOL
Power App

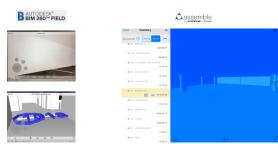
BIM TRACK

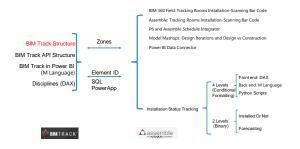
BIM Track in Power BI
(M Language)
Disciplines (DAX)

SOL
Power App

BIM Track in Power BI
(Conditional
BIM Track in Power BI

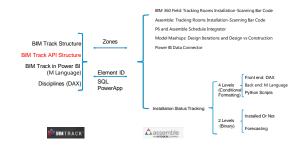
Tracking Rooms Installation-Scanning Bar Code-BIM 360 Field vs Assemble

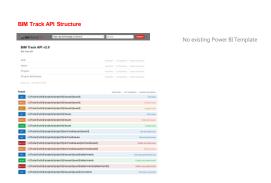


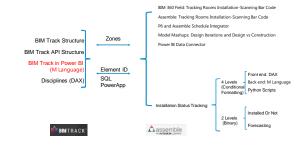


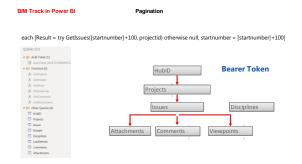


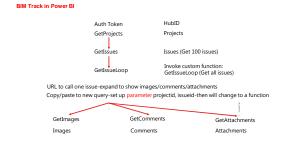


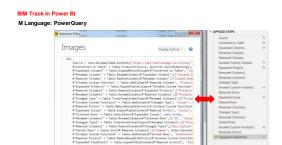




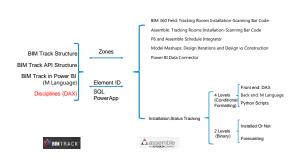


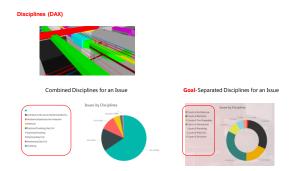






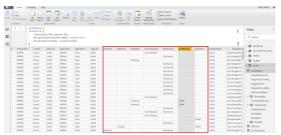






Disciplines (DAX)

Each Discipline is a New Column in Issues Table



Disciplines (DAX)

× ∨ ½	- Table.SelectRoss(#TReplaced Value4", each ([ProjectID] = "9138"))				
E. 121 Hudio	▼ ProjectiD	JF 121 InsuelD w	121 Disciplines.Name	# ⁸ E Disciplines.3d	
	4668 9538	618776	ru ru		nui
	4648 9138	618777	rui rui		nui
	4648 5138	619779	160		mi
4	4668 9138	618790	rei		nul
	4648, 9138	625827	190		mi
6	4645 5135	635638	16		mi
	4648 9138	627730	Electrical	Electrical	
8	4645, 5138	692092	Electrical	Electrical	
9	4668 9538	622652	Electrical	Electrical	
30	4645 5135	632633	SN/OWI	Ov6/59e	
	4645.7035	632634	Electrical	Electrical	
	4668 9538	622655	Electrical	Electrical	
13	4648 5138	632636	Electrical	Electrical	
34	4648 9138	642657	Electrical	Electrical	
25	4648 5138	632657	Plumbing	Plumbing	
16	4848 5138	632636	Electrical	Electrical	
	4648 9138	642650	Electrical	Electrical	
18	4648 5138	632600	Electrical	Electrical	
19	4668 9138	622603	Electrical	Electrical	
30	4645 9138	632662	Plumbing	Plumbing	
21	4645 5135	632803	Electrical	Electrical	
	466X 9138	622884	Electrical	Electrical	
23	4645 9138	632886	Electrical	Electrical	
24	4648 9138	612887	Electrical	Electrical	
25	4648 9138	632888	Electrical	Electrical	
26	4645 5135	632889	Electrical	Electrical	
	4648 9538	622890	Electrical	Electrical	

Set Up New Column for Each Discipline in <u>Issues Table</u> by using <u>Disciplines Table</u>

```
1 Architecture =
    'Disciplines'[Disciplines.Id], -
                                   → What to return?
   Disciplines[IssueID], Issues[IssueID] —
                                     → What to match?
```

VLOOKUP in Excel is different

=VLOOKUP (value, table, col_index, [range_lookup])

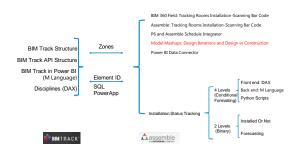
Arguments

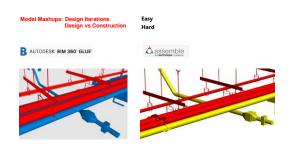
value - The value to look for in the first column of a table.

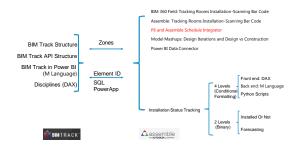
*table - The table from which to retrieve a value.

*col_index - The column in the table from which to retrieve a value.

*range_lookup - [optional] TRUE = approximate match (default). FALSE = exact match.

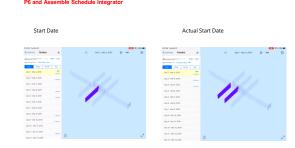


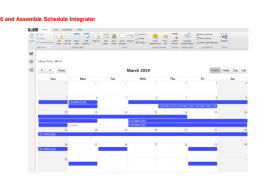




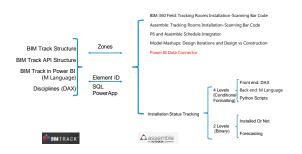


P6 and Assemble Schedule Integrator ScheduleIntegrator S





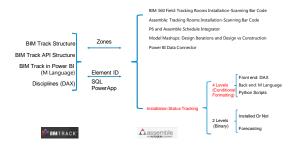




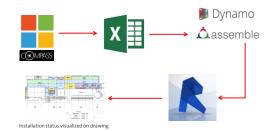


Power BI Data Connector



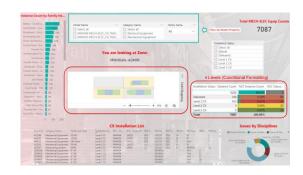


Installation Status Tracking 4 Level





(4.E)-



4 Levels (Conditional Formatting)

Front end DAX method_%GTInstance Count



4 Levels (Conditional Formatting)

Back end M Language method_VDC Status Tracking Back End

"Added Conditional Column" = Table AddColumn(ill"Changed Type1", "VDC Status Tracking Back End", each if [Installation Status] = "Delivered then 90 else if [Installation Status] = and then 0 else if [Installation Status] = "Level 1 C'X" then 10 else if [Installation Status] = "Level 2 CX" then 2 dee if [Installation Status] = Level 3 CX" then 30 dies most service services and services and services and services are services and services and services are services and services and services are services are services and services are services and services are services are services are services and services are services and services are services are services are services are services are services and services are services are services are services are services are services and services are s



4 Levels (Conditional Formatting)

Back end M Language method_VDC Status Tracking Back End

Background color - VDC Status Tracking Back End



4 Levels (Conditional Formatting)

Back end M Language method_VDC Status Tracking Back End

M - language used in PowerQuery in Excel

DAX - VBA in Excel

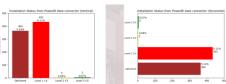
4 Levels (Conditional Formatting)

Python Scripts



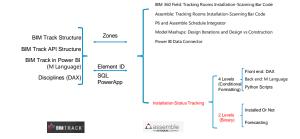
4 Levels (Conditional Formatting) **Python Scripts**





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CLAYCO THE ART & SCIENCE OF BUILDING

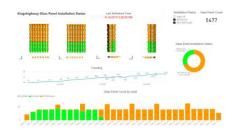
100 Kingshighway will be a 36-story, luxury apartment tower overlooking Forest Park.

Once complete, tower will be tallest residential building in the city of St. Louis. Along with the building size, another striking feature will be the project incredible modernist exterior, designed by Studio Gang. The large expanses of glass facade are intended to give the building's residents a range of natural lighting and sweeping views of the park and city. Clayor's subsidiary, Ventana was selected to design, manufacture, and install the exterior window systems.

The base of the tower will be a mix of retail space, apartment amenity space, and parking. The parking garage will have a 185-vehicle capacity. Concrete Strategies is providing the reinforced concrete structure. The tower itself will contain 316 apartment units. The project broke ground in the Spring of 2018.



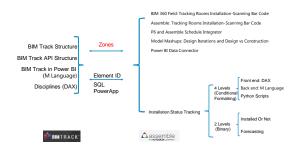
2 Levels (Binary) Installed Or Not



2 Levels (Binary)

Condition











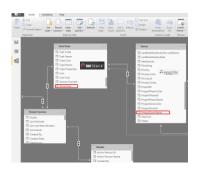
Zones

Your first dashboard



https://forge.autodesk.com/

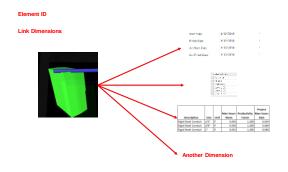
Zones

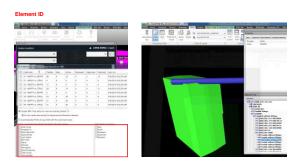




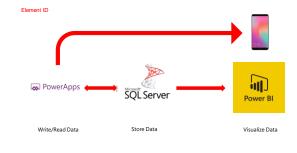
For a specific COLO, if the installation status is shown 100% while there are still active issues, then it indicates site installation is not following BIM coordination.



















Element ID Could use phone to scan code-Cell layout





Element ID



Q & A

Thank You!



Austrials and the Austrials tops are replaced frederinsks or indicated, loc., and/or the substitions and/or difficus in the USA entire other courses. All other force courses, and other force courses courses are considered as the course of the course course courses are courses of the course course course courses are courses of the course course course courses are courses of the course course courses are courses are course and other courses are course courses are courses are course courses are course courses are courses are course and other courses.