

CITA Presentation – Digital Tools for Project Management

Jonathan Sutton

- **Intros**

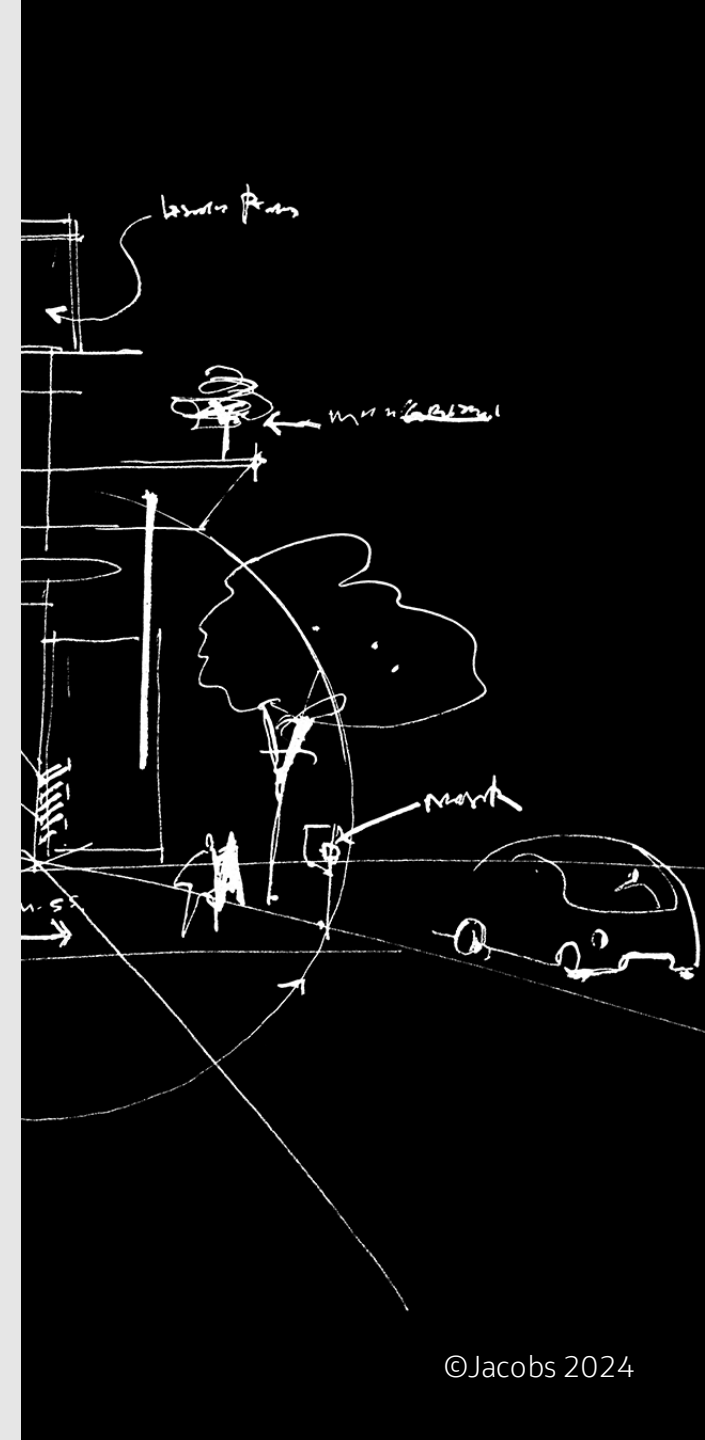
- Jonathan Sutton
- Jacobs
- Life Sciences

- **Digital Tools for Project Management**

- ACC as model hosting environment
- Revizto for Design Coordination
- Laser Scanning for Construction Verification
- MS Teams as our Digital Hub
- Power BI & Alluvial for Digital Reporting

- **Emerging Technology**

- Artificial Intelligence



Who are Jacobs?

Corporate Overview

Quick facts

1947
Founded by Joseph J. Jacobs



Headquartered in Dallas, Texas


Fortune's Most Admired

No. 1 for the second year in a row
Ranking high since 2006

ENR's Top Firms

#1 on Top 500 Design Firms in 2021
#2 on Top 200 Environmental Firms in 2021

Our Markets



People and Places Solutions



Critical Missions Solutions

Jacobs

Challenging today.
Reinventing tomorrow.

To create a more connected,
sustainable world.



We do things right.

We challenge the accepted.

We aim higher.

We live inclusion.

Our Sectors



Environmental



Transport and Infrastructure



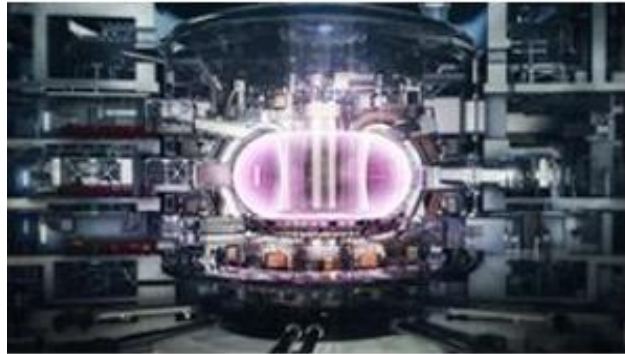
Mission Solutions



Advanced Facilities



CYBER



Power

Life Sciences Overview

Industry Leader in Drug Substance, Drug Product, Vaccine Manufacturing and Gene and Cell Therapy Manufacturing facilities

3,400 **20** **#1**

Global resources dedicated to Life Sciences work

ISPE Facility of the Year Award Winner since 2010, 6 in the past 5 years

ENR Overall & Design Firm Global and Pharmaceuticals

1.75 B \$ Revenue

Subject Matter Experts specialising in Process, Process Architecture, Technology and Regulatory Compliance

Solutions In:

- Advanced Planning / Consulting
- Site Selection, Master Planning
- Architecture & Engineering
- Process Design
- Single use technology
- Procurement
- Construction Management
- Regulatory Compliance
- Commissioning, Qualification & Validation
- On-site Contact Tracing
- Digital Twinning
- Cybersecurity
- Sustainability
- Environmental Studies
- Value Engineering
- 3D/4D/5D Design & BIM

For Facilities:



Research and Pilot



Vaccine Manufacturing



API



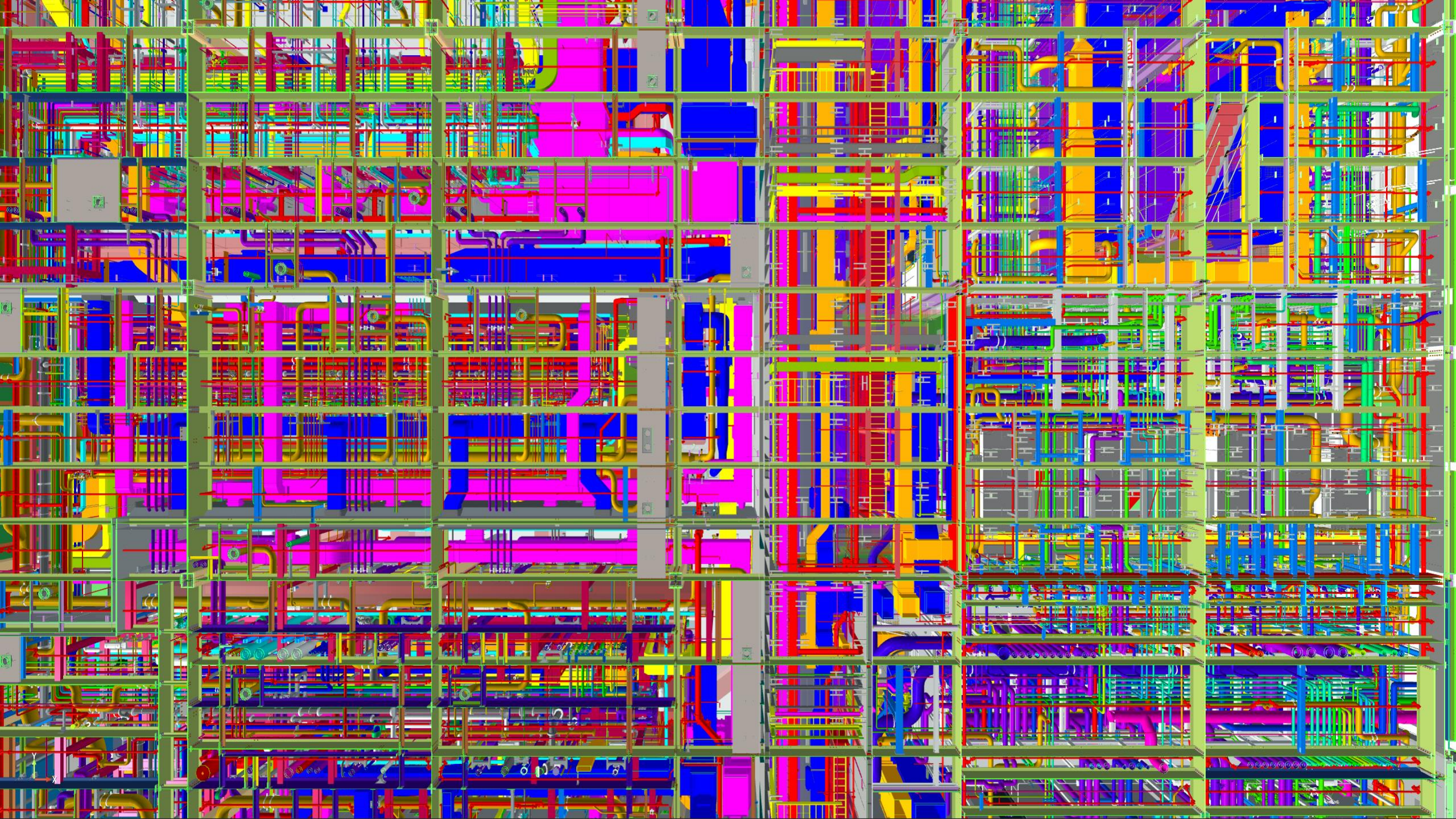
Biologics



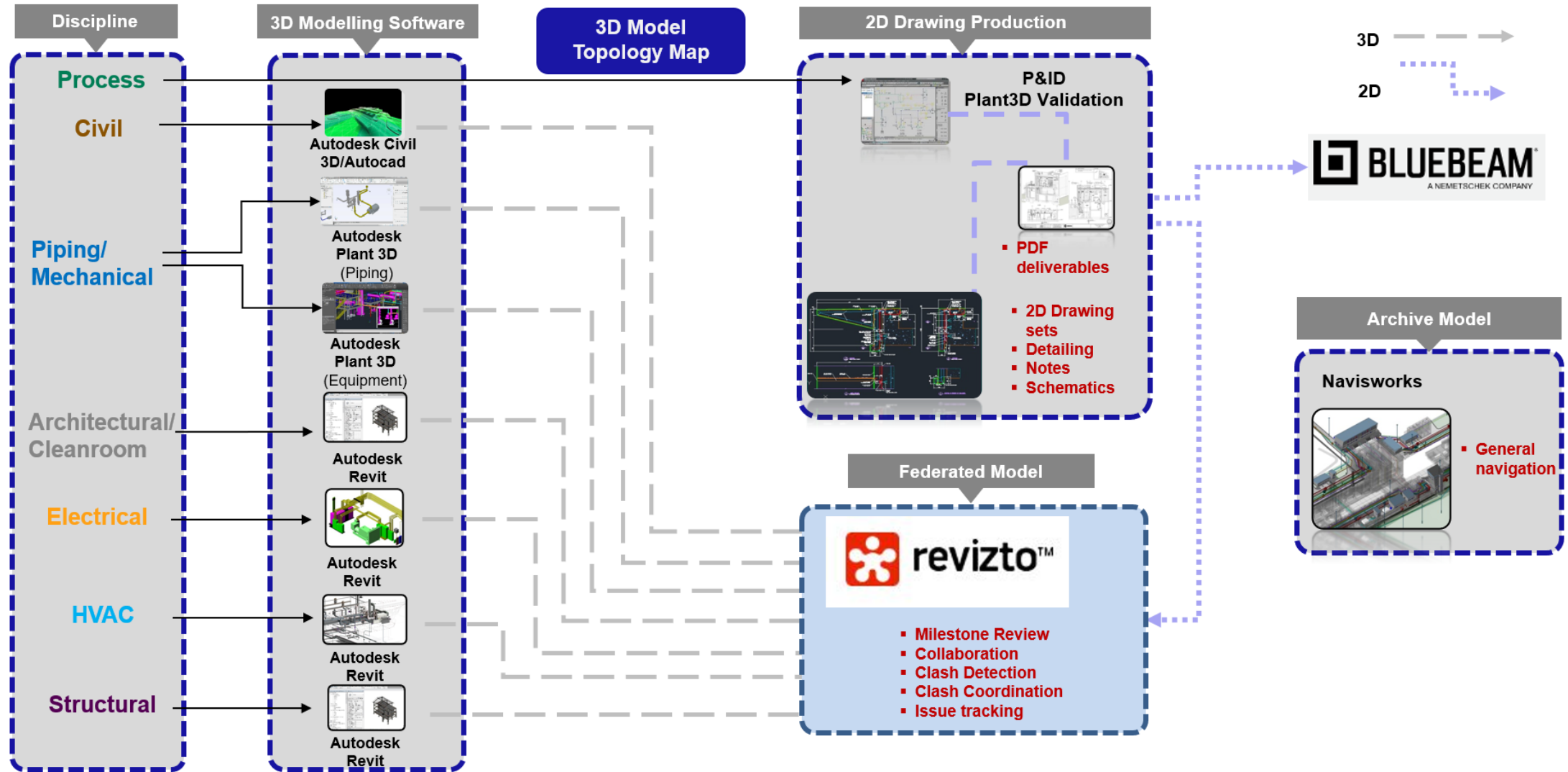
Cell & Gene Therapy



Fill Finish and OSD



What is Jacobs LS doing now?



AUTODESK CONSTRUCTION CLOUD Common Data Environment: Autodesk Construction Cloud

Design coordination technology



Single Source of Truth for Any Project

Central Hub for All Models

View the entire project by federating all intelligent BIM data including reality capture into a centralized user-friendly location and get all teams in-sync.

Real-time Issue Tracker

Easily standardize the way data moves through the project and effectively communicate model-based tasks with the team.

2D/3D Model Synergy

Leverage a unique 2D/3D combined view, easily compare 2D sheets and work with live CDE documentation seamlessly from inside Revizto.



Revizto Total Solution

VR Immersive Experience

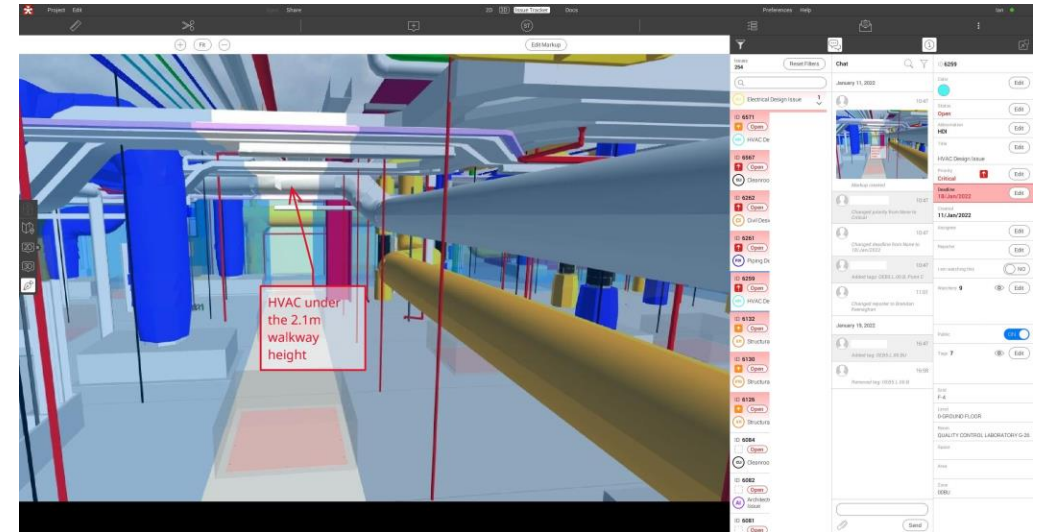
Explore real-model data and coordination issues by leveraging Revizto's immersive, true-to-scale VR experience within seconds!

Clash free projects

Import and manage all your clashes inside Revizto. View issues in native modeling software, assign accountability and track changes to ensure all clashes are quickly and fully resolved.

Collaboration from Anywhere

Contribute from the office or on-site. Keep all trades on task and monitor their progress in the field and access all the project data on a mobile device.



Design coordination technology

Clash Automation

Clash test: ME_vs_EL | Total: 259 | 258 | 1 | 12

Clash test is being edited by you. Only you can edit the clash test until you relinquish it. [Relinquish]

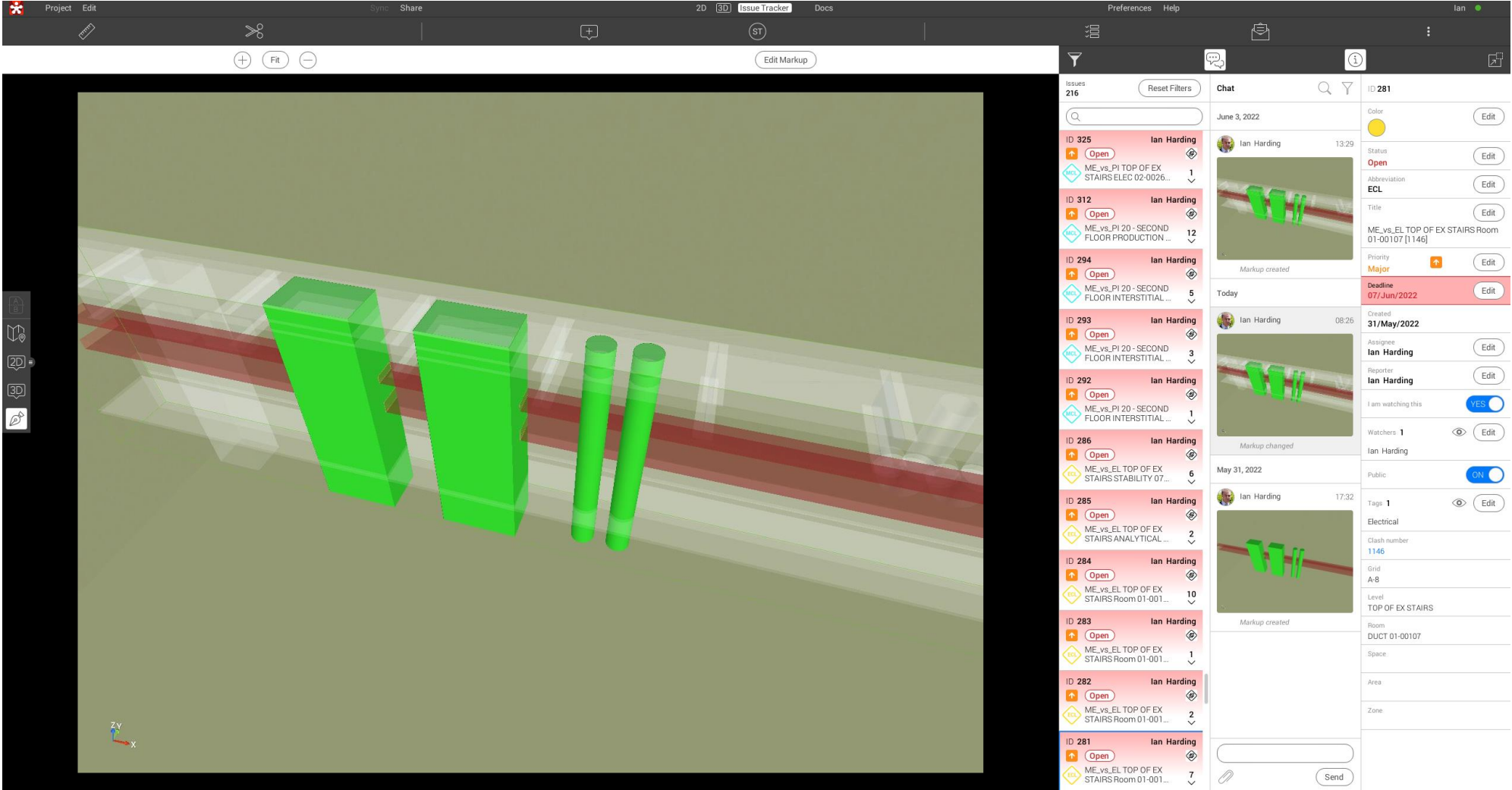
Filters: Clashing: All | New: All | Status: All | By selection: None | Search sets: None | Grid: All | More

Name	Count	Clashing	New	Status
> 20 - SECOND FLOOR L...	2143	3	3	NOT REVIEWED
> 20 - SECOND FLOOR L...	2147	2	2	NOT REVIEWED
> BOTTOM OF EXTER...	2170	2	2	NOT REVIEWED
> BOTTOM OF EXTER...	2178	1	1	NOT REVIEWED
> BOTTOM OF EXTER...	2195	1	1	NOT REVIEWED
> BOTTOM OF EXTER...	2197	4	4	NOT REVIEWED
> 20 - SECOND FLOOR L...	2204	2	2	NOT REVIEWED
> 20 - SECOND FLOOR L...	2214	2	2	NOT REVIEWED
> BOTTOM OF EXTER...	2224	4	4	NOT REVIEWED
> BOTTOM OF EXTER...	2233	8	8	NOT REVIEWED
> 20 - SECOND FLOOR L...	2262	2	2	NOT REVIEWED
> 10 - FIRST FLOOR GI...	2276	2	2	NOT REVIEWED
> 10 - FIRST FLOOR N...	2286	1	1	NOT REVIEWED
> 10 - FIRST FLOOR MA...	2297	4	4	NOT REVIEWED
> 20 - SECOND FLOOR L...	2304	2	2	NOT REVIEWED
> 20 - SECOND FLOOR L...	2307	3	3	NOT REVIEWED
> 10 - FIRST FLOOR PU...	2312	2	2	NOT REVIEWED
> 10 - FIRST FLOOR PU...	2315	1	1	NOT REVIEWED
> 20 - SECOND FLOOR L...	2320	5	5	NOT REVIEWED
> 10 - FIRST FLOOR PU...	2331	31	31	NOT REVIEWED
> 10 - FIRST FLOOR FL...	2340	19	19	NOT REVIEWED
> 20 - SECOND FLOOR L...	2387	9	9	NOT REVIEWED
> 20 - SECOND FLOOR L...	2402	4	4	NOT REVIEWED
> 20 - SECOND FLOOR L...	2412	8	8	NOT REVIEWED
> 20 - SECOND FLOOR L...	2421	2	2	NOT REVIEWED
> 20 - SECOND FLOOR L...	2424	2	2	NOT REVIEWED
> 20 - SECOND FLOOR L...	2427	2	2	NOT REVIEWED
> 20 - SECOND FLOOR L...	2430	1	1	NOT REVIEWED
> 20 - SECOND FLOOR...	2435	1	1	NOT REVIEWED
> TOP OF EX STAIRS S...	2437	10	10	NOT REVIEWED
> TOP OF EX STAIRS ...	2443	4	4	NOT REVIEWED
> TOP OF EX STAIRS BL...	2448	20	20	NOT REVIEWED
> TOP OF EX STAIRS BL...	2469	5	5	NOT REVIEWED
> TOP OF EX STAIRS BL...	2475	1	1	NOT REVIEWED
> TOP OF EX STAIRS BL...	2477	1	1	NOT REVIEWED

Selected 259 clashes | Total 259 clashes | 1020 subclasses

Rectangular Duct
Source File: B01-JAC-H-XX-XX-001.rvt
Layer: Level 1
Family: GS-Mitered Elbows / Taps
Category: Ducts

Design coordination technology



Construction Verification

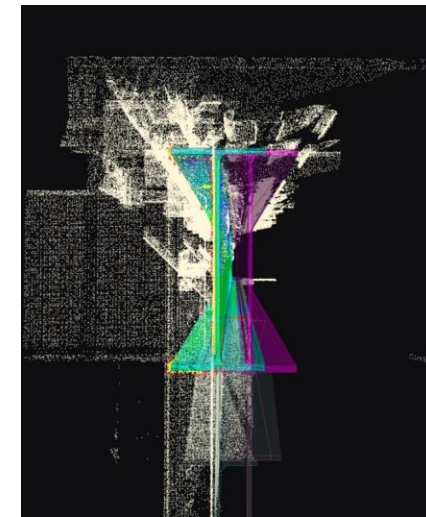
Verifying the work package is installed as per design

Pile No.	DESIGN CO-ORDINATES			AS-BUILT CO-ORDINATES		DEVIANCE FROM DESIGN TO AS-BUILT		
	Eastings	Northings	Cut-off Level	As Built Easting	As Built Northing	Δ Easting	Δ Northing	Res.
P12	129.311	107.545	28.195	128.183	107.552	-0.128	0.007	0.128
P13	130.111	99.680	28.195	130.034	99.666	-0.077	-0.014	0.078
P14	130.111	97.880	28.195	130.136	97.880	0.025	0.000	0.025
P16	129.311	97.880	28.195	129.311	97.862	0.000	-0.018	0.018
P17	130.111	91.815	28.195	130.174	91.757	0.063	-0.058	0.096
P18	130.111	90.015	28.195	130.110	89.990	-0.001	-0.025	0.026
P19	129.311	91.815	28.195	128.336	91.700	-0.025	-0.055	0.060
P20	129.311	90.015	28.195	129.412	90.035	0.101	0.020	0.105
P21	127.411	85.965	28.195	127.419	85.933	0.008	-0.032	0.033
P22	127.411	82.965	28.395	127.424	82.941	0.013	-0.024	0.027
P23	129.211	85.965	28.195	129.130	84.979	-0.081	-0.086	0.116
P24	129.211	82.965	28.195	129.243	82.967	0.032	0.002	0.032
P25	131.011	85.965	28.195	131.015	85.997	0.004	0.032	0.032
P26	131.011	82.965	28.195	131.045	82.965	0.034	0.000	0.034

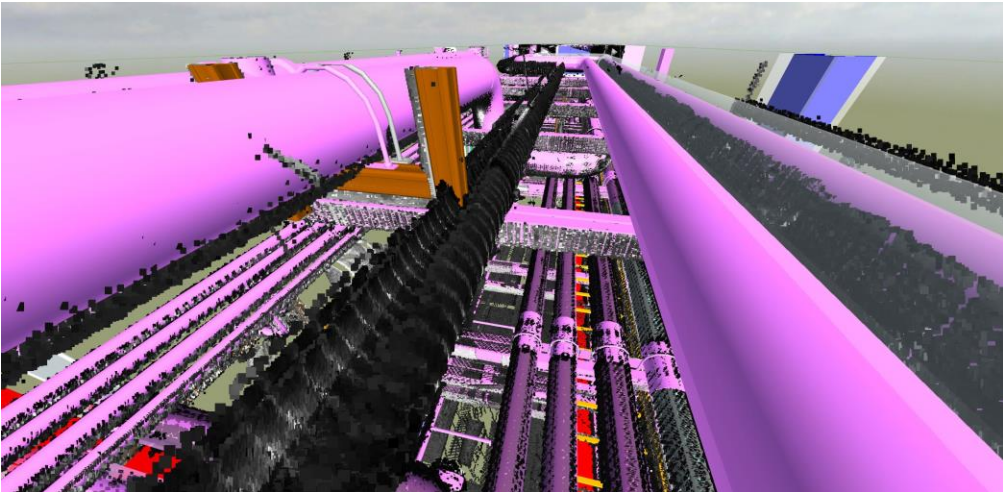
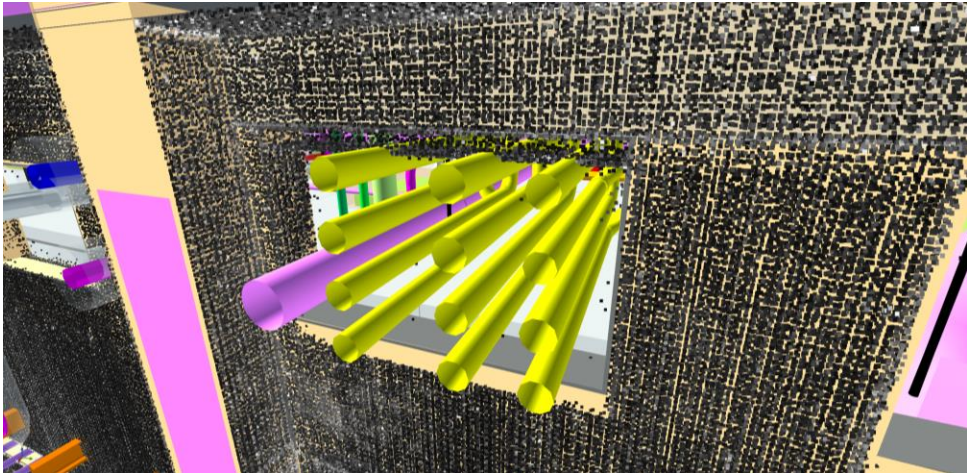
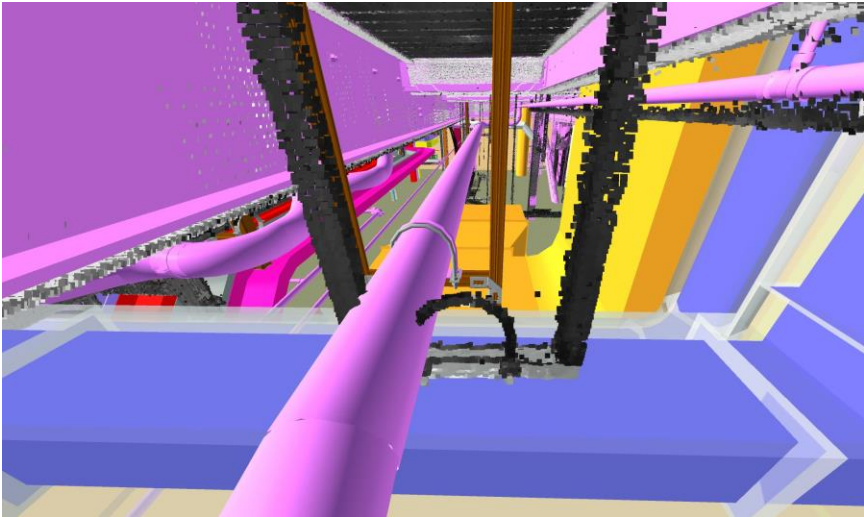
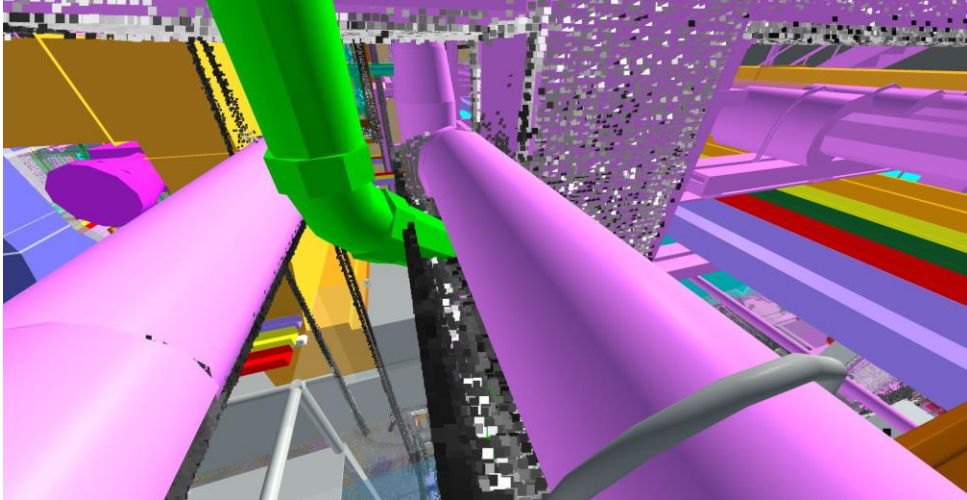


Report Date: 04/11/2024
Client Name: [REDACTED]

As-Built Results	Design Information		As-Built Information				As-Built Results	Observation	
	Code	1:50 Design Model	Point ID	Code	1:50 Model or Setting	Setting			Horizontal
GRD	20/24/2021	129.311	107.545	28.195	128.183	107.552	-0.128	0.007	0.128
GRD	20/24/2021	130.111	99.680	28.195	130.034	99.666	-0.077	-0.014	0.078
GRD	20/24/2021	130.111	97.880	28.195	130.136	97.880	0.025	0.000	0.025
GRD	20/24/2021	129.311	97.880	28.195	129.311	97.862	0.000	-0.018	0.018
GRD	20/24/2021	130.111	91.815	28.195	130.174	91.757	0.063	-0.058	0.096
GRD	20/24/2021	130.111	90.015	28.195	130.110	89.990	-0.001	-0.025	0.026
GRD	20/24/2021	129.311	91.815	28.195	128.336	91.700	-0.025	-0.055	0.060
GRD	20/24/2021	129.311	90.015	28.195	129.412	90.035	0.101	0.020	0.105
GRD	20/24/2021	127.411	85.965	28.195	127.419	85.933	0.008	-0.032	0.033
GRD	20/24/2021	127.411	82.965	28.395	127.424	82.941	0.013	-0.024	0.027
GRD	20/24/2021	129.211	85.965	28.195	129.130	84.979	-0.081	-0.086	0.116
GRD	20/24/2021	129.211	82.965	28.195	129.243	82.967	0.032	0.002	0.032
GRD	20/24/2021	131.011	85.965	28.195	131.015	85.997	0.004	0.032	0.032
GRD	20/24/2021	131.011	82.965	28.195	131.045	82.965	0.034	0.000	0.034



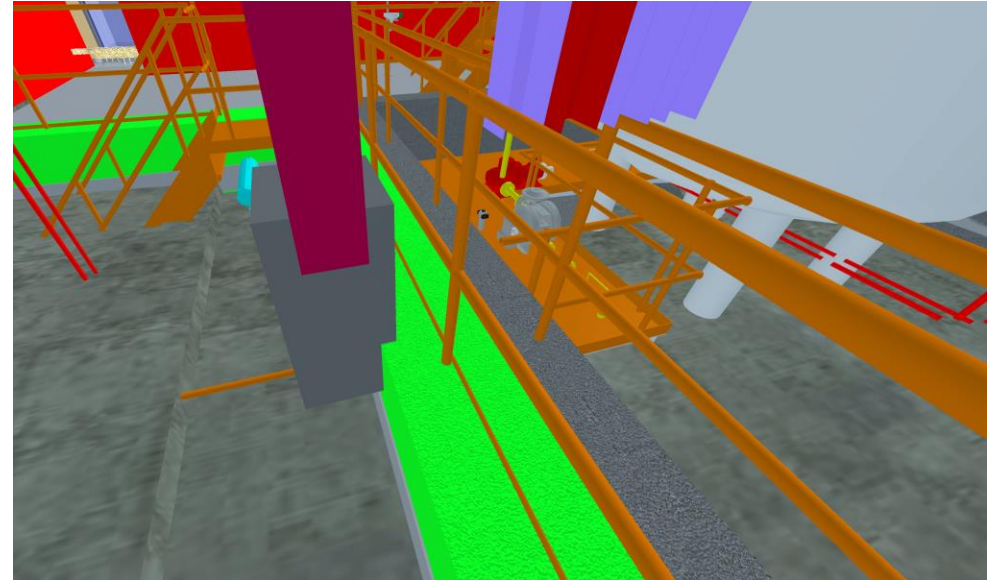
Construction Verification



Construction Verification

Foundation installation incident:

- Installed 300mm south of design
- Supporting external pipe rack (60m span)



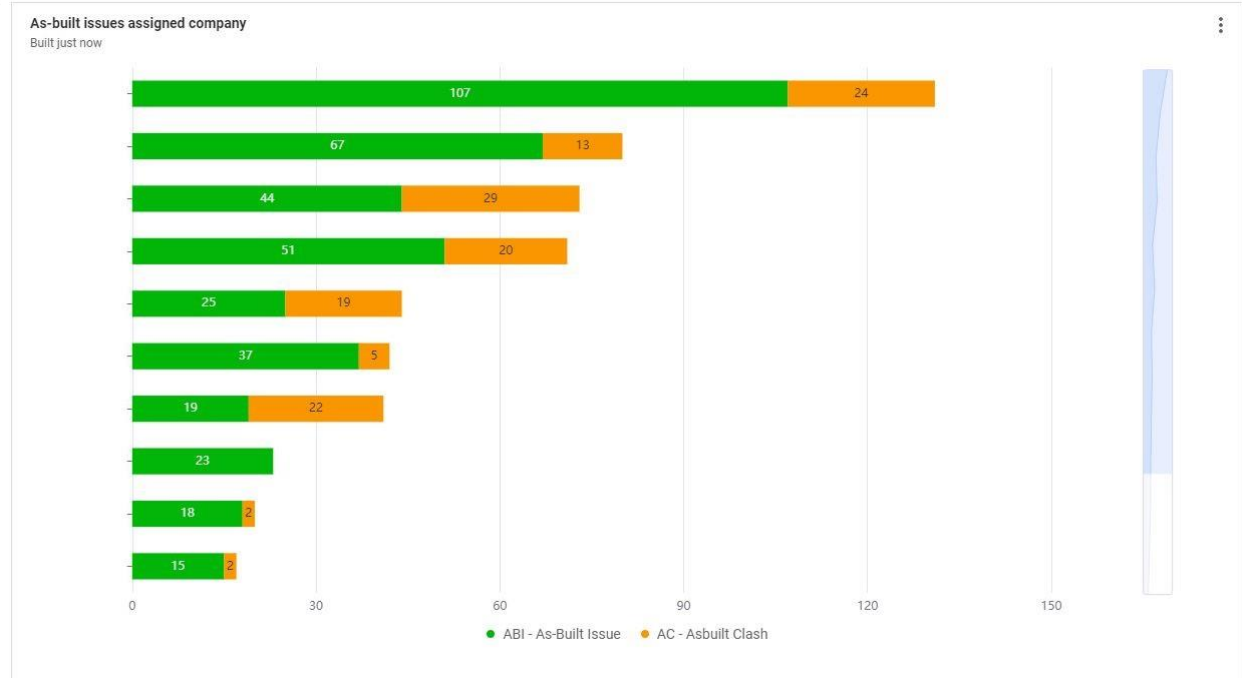
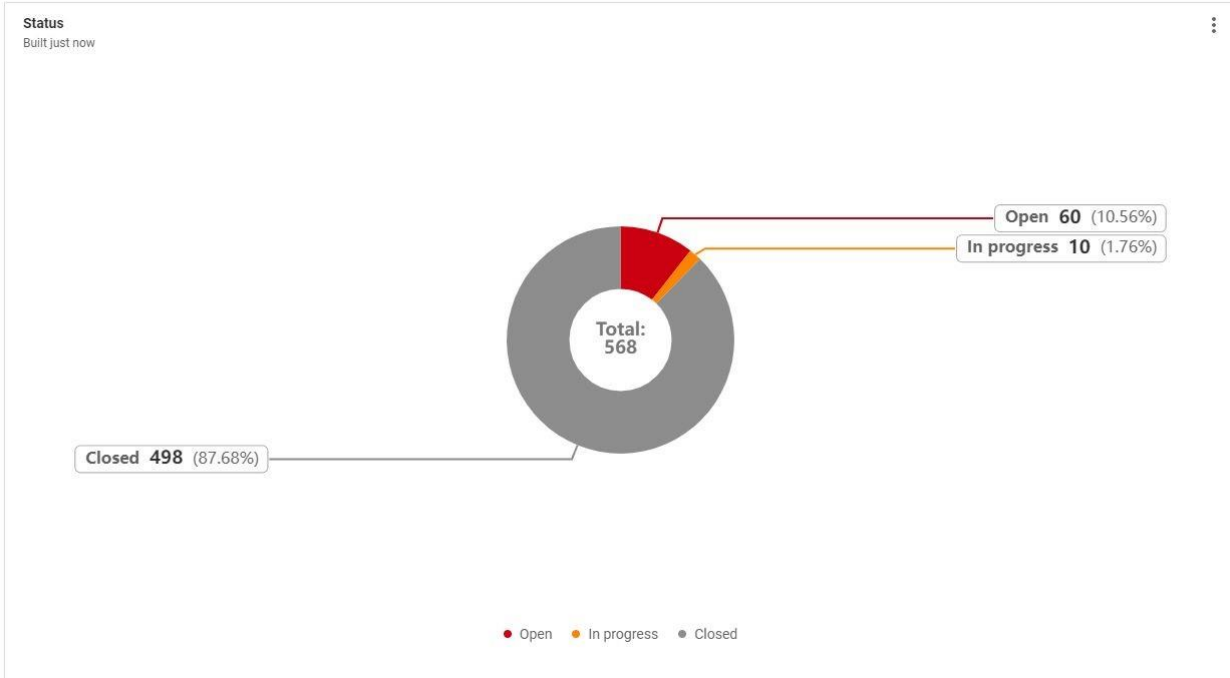
Actual Impact:

- Design changes made to piperack
- €10,000 to redesign

Unrealised Impact:

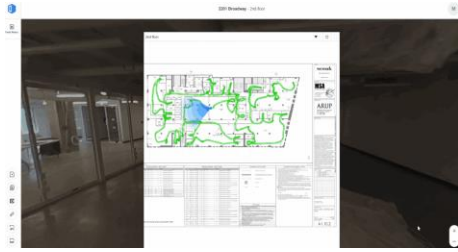
- Approx. €600k in rework
- Eight week schedule impact
- Increase in resource requirements

Revizto - Metrics



Digital Hub Space – improving communication and collaboration

Site Camera with BIM 4D Integration

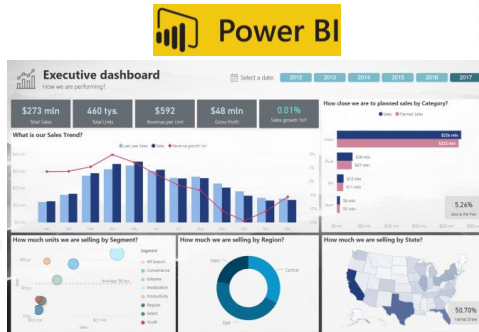


Ability to limit access to Channels

IPD Team in one environment



Client CDE



M U R A L



Communication & Shared Calendar Centralised



Control access and collaborate on single source files



Birds eye visual of the project.



Data capture and tracking apps.



Record & Collaborate on meeting notes

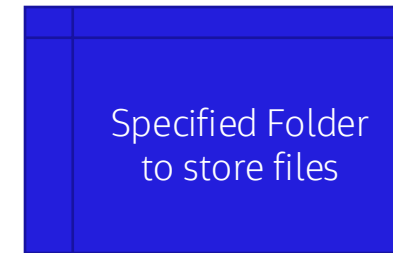
BCON Near Real-time Reporting – using Robotic Process Automation (RPA)



Schedule reports from data source software.



A Power Automate workflow downloads the attachments from the emails, renames the files and saves them into the specified folder. This workflow is scheduled to run at a specific time twice daily.



25-105mins of time saved/wk and report updated daily, every 4-8hrs.

Power BI report scheduled to refresh data at specified times (twice daily)

Power BI report created and linked to source data files in specified cloud folder



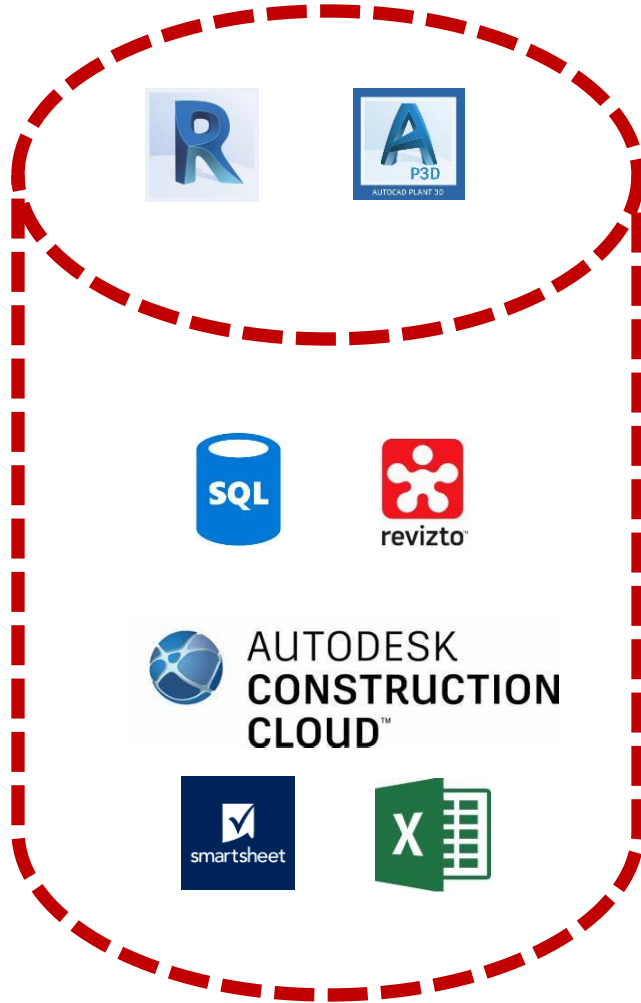
Power BI report data updated approx. every 4 hours.

Power BI report Linked into MS Teams Site for all stakeholders to access.

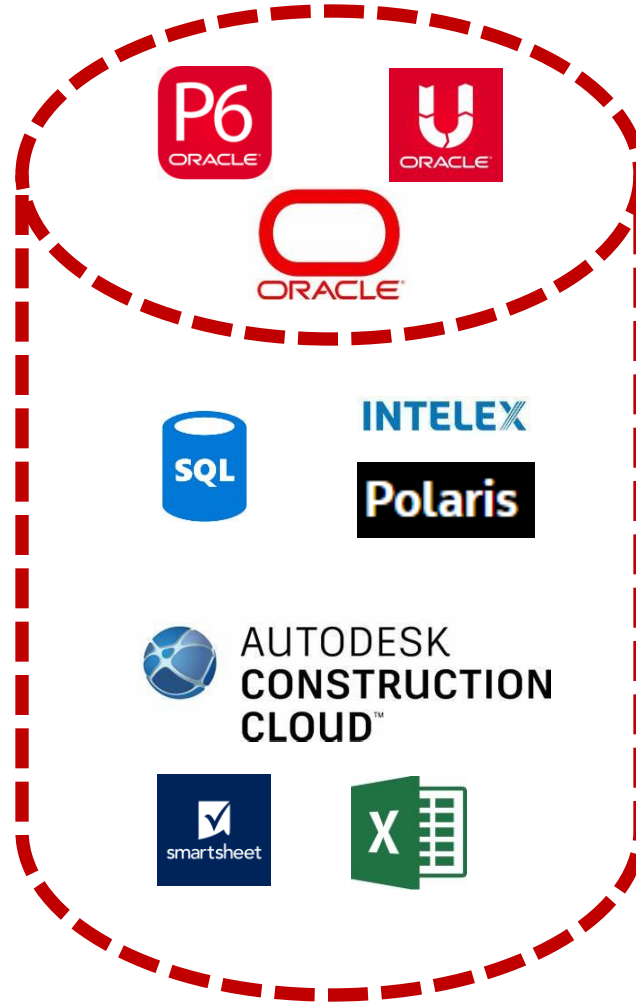


Data Analytics – Types of Data

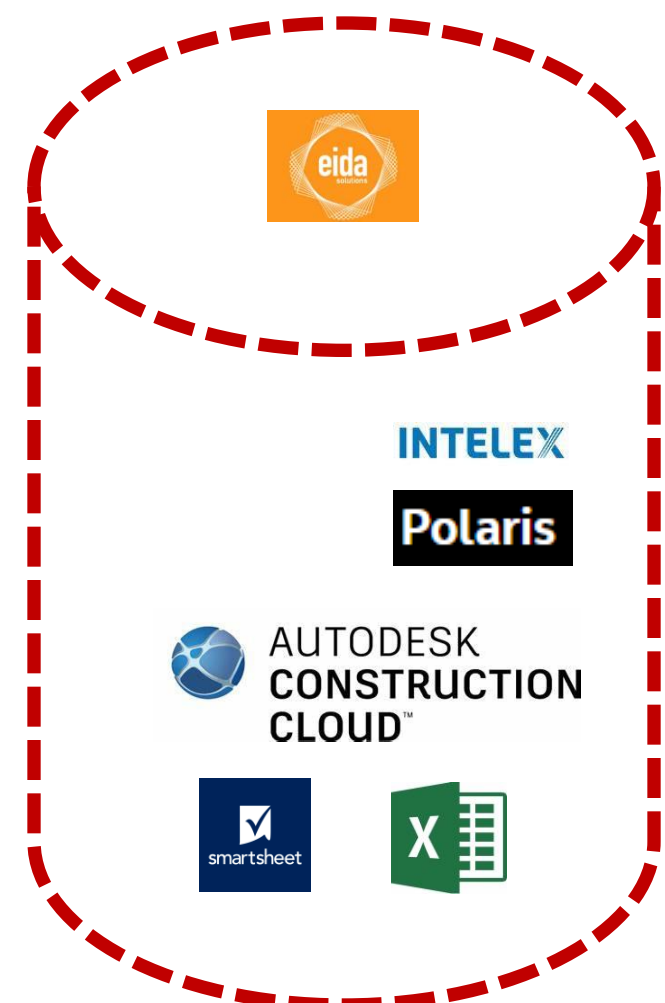
Design



Project Services



Construction

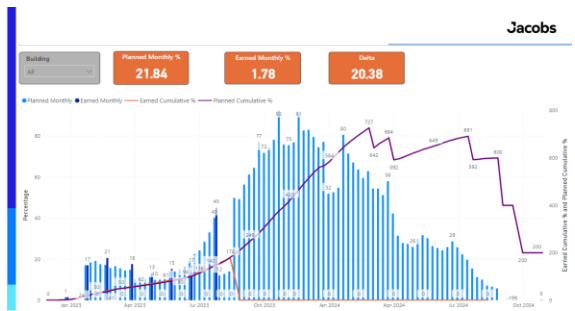


Digital Interactive Reporting

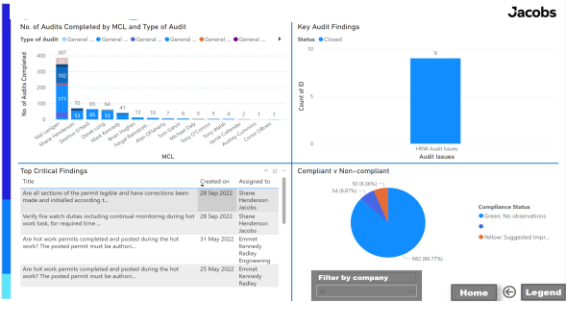


■ revolutionizes collaboration ■ streamlines communication ■ simplifies access to resources

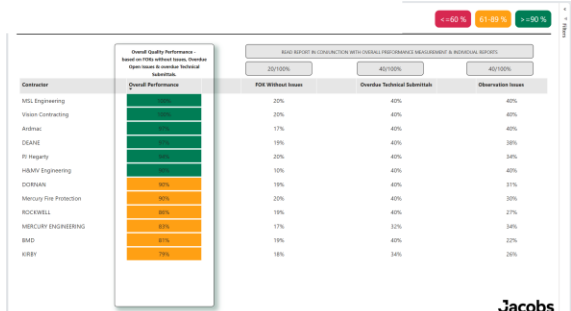
Schedule



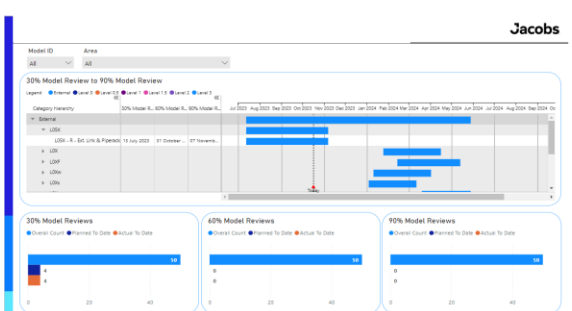
Safety



Quality & Turnover



Engineering



Artificial Intelligence (AI)

Opportunity

This technology has the capability today to assist us in improving efficiency in our daily routine both at work and at home.

•**Nick Bostrom:** *“Machine intelligence is the last invention that humanity will ever need to make.”*

 OpenAI
ChatGPT

 OpenAI
DALL·E 2

Google



 OpenAI



 Copilot

Case Studies – Work out Excel formulas or simple scripts.



You

I need an excel formula that will vlookup the input for a cell if a cell contains "1" or will input the contents of another cell.



ChatGPT

You can use the following formula to achieve this:

SCSS

Copy code

```
=IF(A1=1,VLOOKUP(B1,Table,2,FALSE),C1)
```



You

How do I extract a list of files, including file paths and file size, from a folder directory to excel using PowerShell



ChatGPT

To extract a list of files, including file paths and file sizes, from a folder directory and save it to Excel using PowerShell, you can follow these steps:

1. Open PowerShell: Press the Windows key, type "PowerShell," and click on "Windows PowerShell" or "PowerShell" to open the PowerShell command-line interface.
2. Navigate to the desired folder: Use the "cd" command to navigate to the folder directory you want to extract the file list from. For example, if the folder is located on the desktop, you can type the following command and hit Enter:

powershell

Copy code

```
cd C:\Users\YourUsername\Desktop
```

Replace "YourUsername" with your actual username.


1. Run the PowerShell command to generate the file list: Use the following command in PowerShell to generate a list of files, including their paths and file sizes:

powershell


Copy code

```
Get-ChildItem -File -Recurse | Select-Object FullName, Length | Export-
```

Case Studies – Used to work out DAX formulas in Power BI.

 You

I am trying to write a DAX formula that will only count the latest revision of documents in a data set

 ChatGPT


To count only the latest revision of documents in a DAX formula, you can use the following approach:

1. First, you need to identify the latest revision for each document. You can achieve this using the MAXX function in DAX. Assuming you have a table named "Documents" with columns "DocumentID" and "RevisionDate", you can create a new table that lists the latest revision date for each document using the following formula:

```
LatestRevisions = SUMMARIZE(Documents, Documents[DocumentID], "LatestRe
```

 You

how do I create a new table in Power BI that merges the info from two other tables in power bi?

 ChatGPT

To create a new table in Power BI that merges the information from two other tables, you would typically use the "Merge Queries" feature in Power Query Editor. Here's a step-by-step guide on how to achieve this:

1. **Load the First Table:**

- Import the first table into Power BI by connecting to your data source.

2. **Load the Second Table:**

- Import the second table into Power BI as well.

3. **Merge Queries:**

- Go to the "Home" tab in Power BI.
- Click on "Transform data." This opens the Power Query Editor.

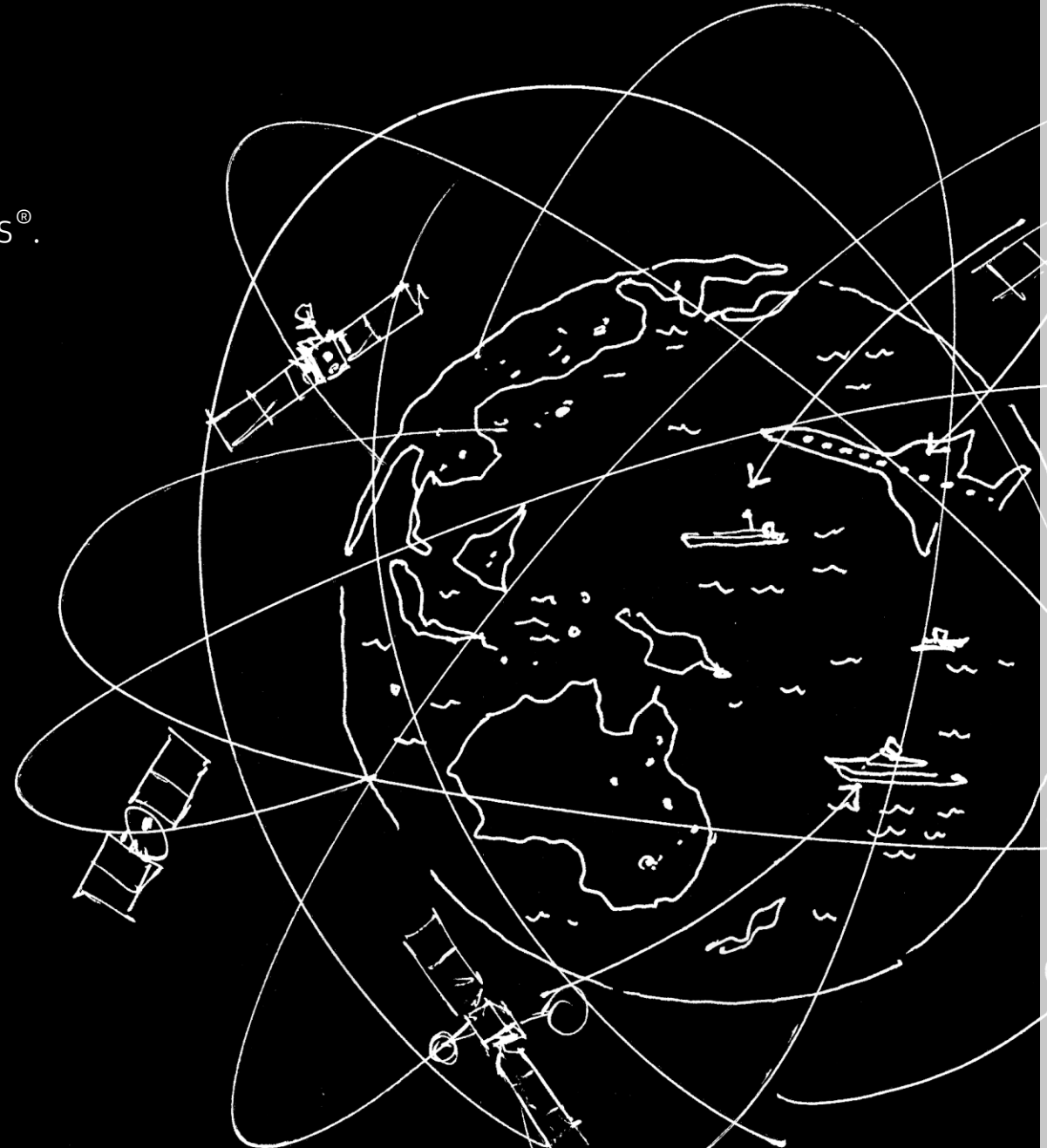
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Thank you

Let's re-imagine tomorrow

Jacobs

Challenging today.
Reinventing tomorrow.

