

# BLD473618

## Delivering the Value of BIM to Owners with a Digital Twin

**Robert Bray**

General Manager & Senior Director, Autodesk, Inc.

**Tim Kelly**

Senior Product Manager, Autodesk, Inc.



# About the Speakers



**Robert “Bob” Bray**

As the General Manager of Autodesk Tandem™, Bob is incubating a new business initiative within Autodesk. Our mission is to transform the built asset lifecycle with Digital Twin technology and solutions. In the past 23 years at Autodesk, Bob has served in several critical product development roles and has led the product development of BIM360 Design and Autodesk InfraWorks. Bob holds a BS in Computer Science from the University of Missouri.



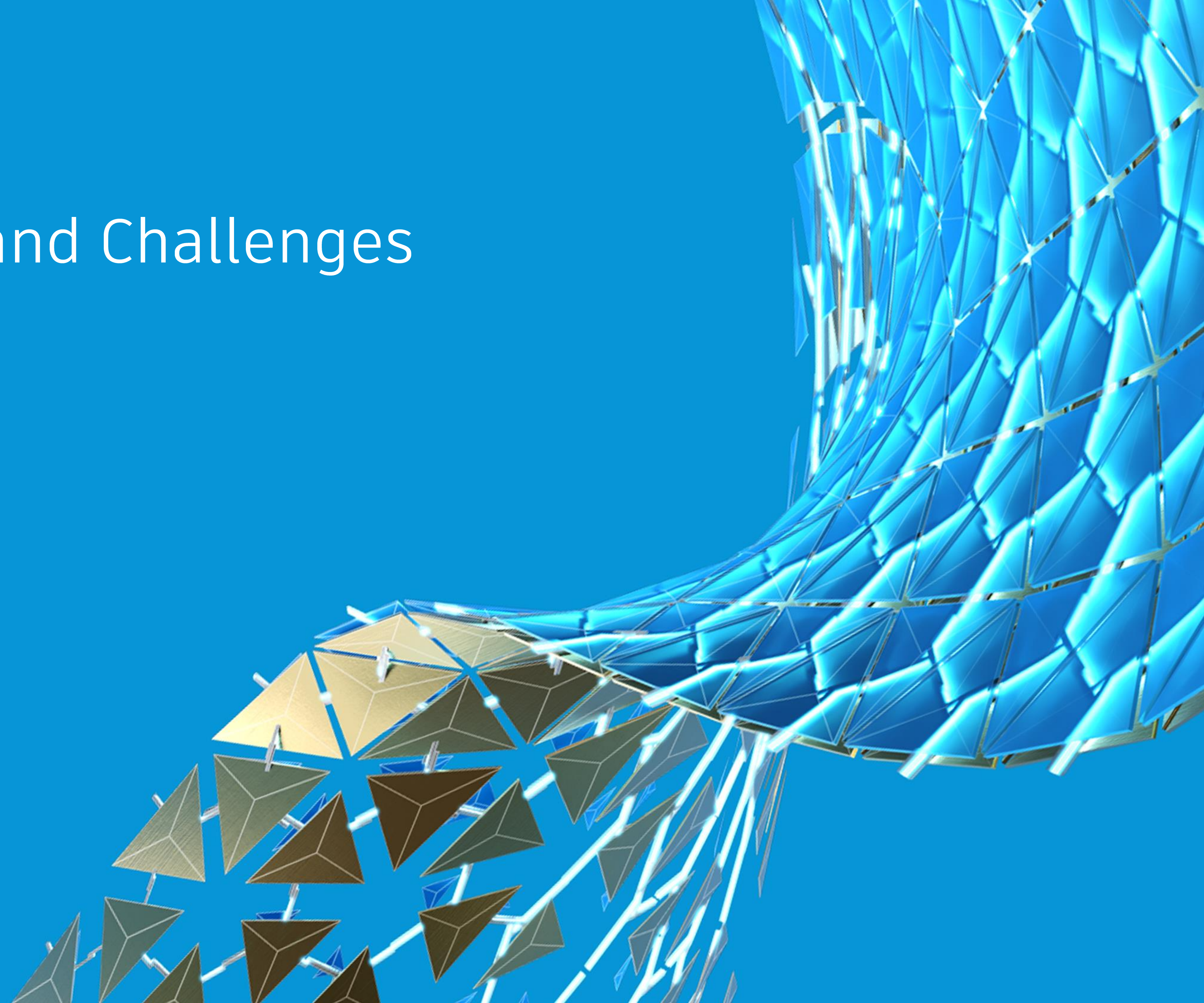
**Tim Kelly**

As the Product Manager of Autodesk Tandem™, Tim is responsible for shaping the product and workflows. Tim has a wealth of industry and product experience having worked as a BIM Manager for Satterfield & Pontikes Construction, and as a Product Manager at Assemble Systems and Autodesk. Tim holds a BS in Construction Science from Texas A&M University.



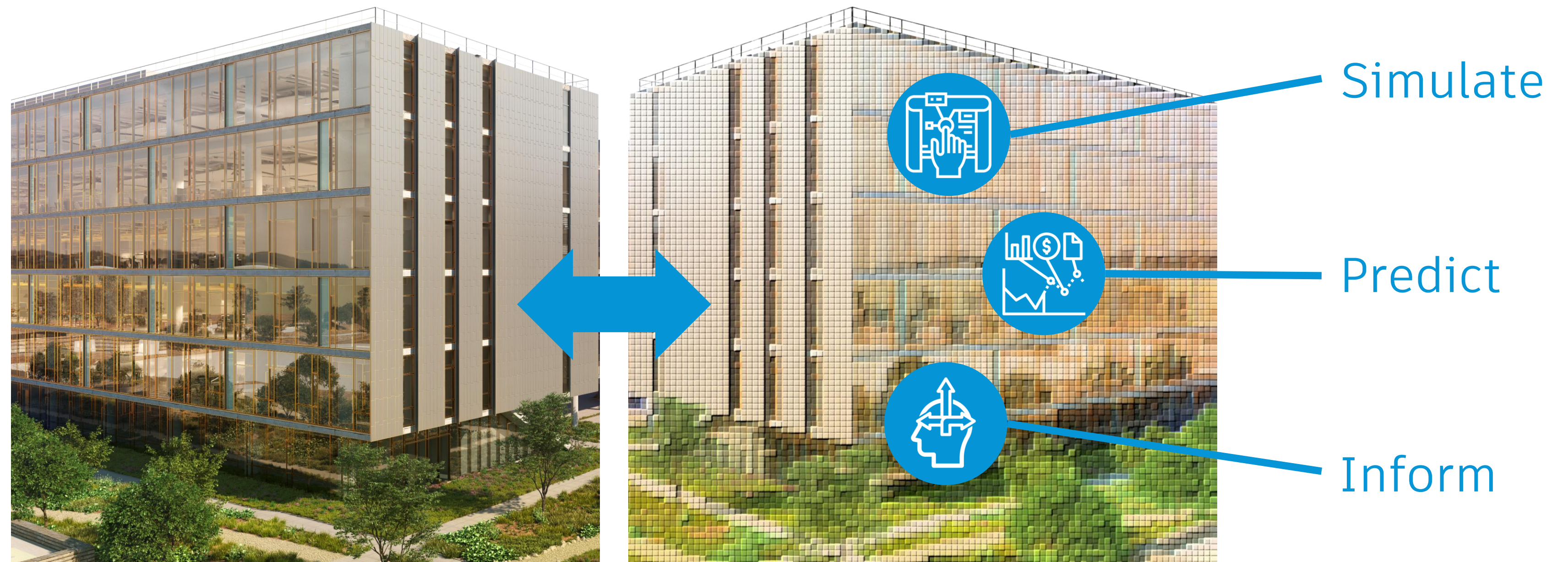
# Digital Twin

## Opportunities and Challenges



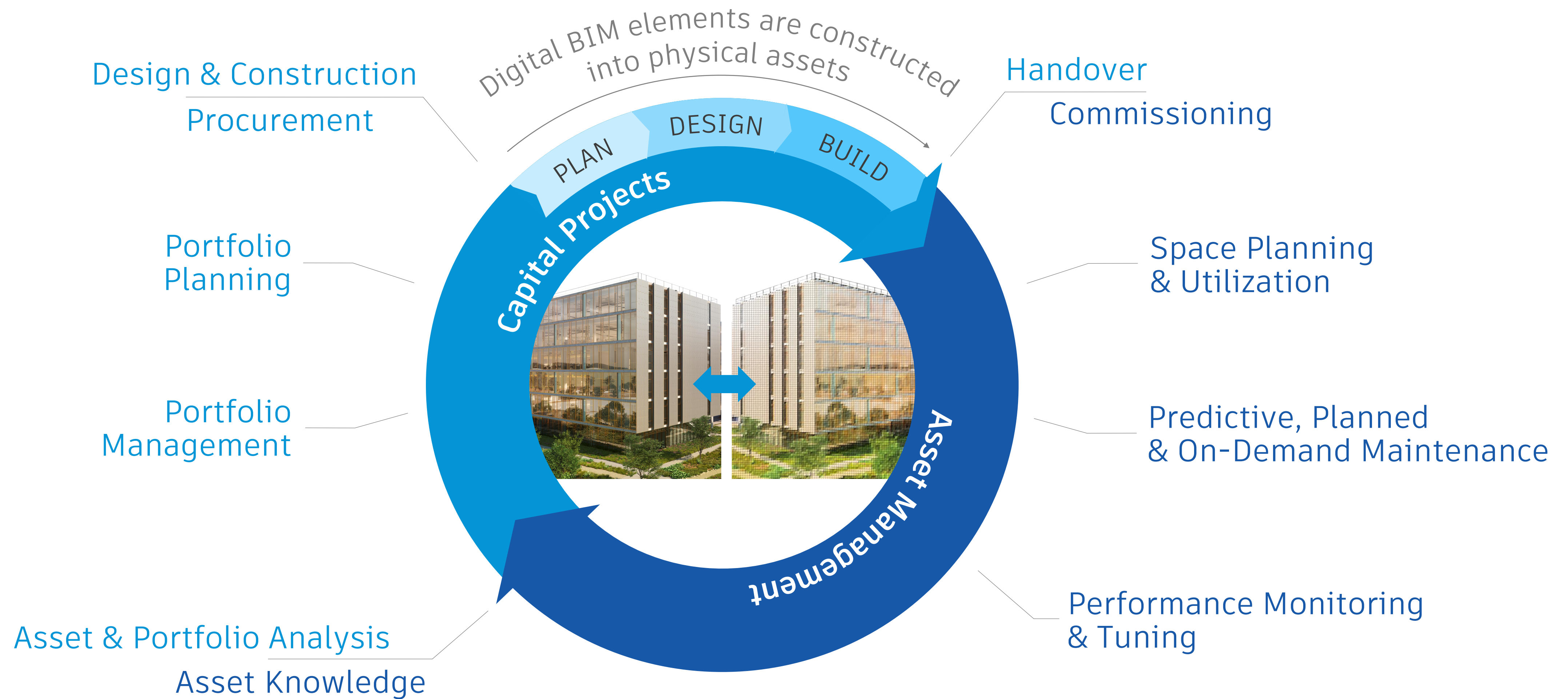


# What is a Digital Twin?

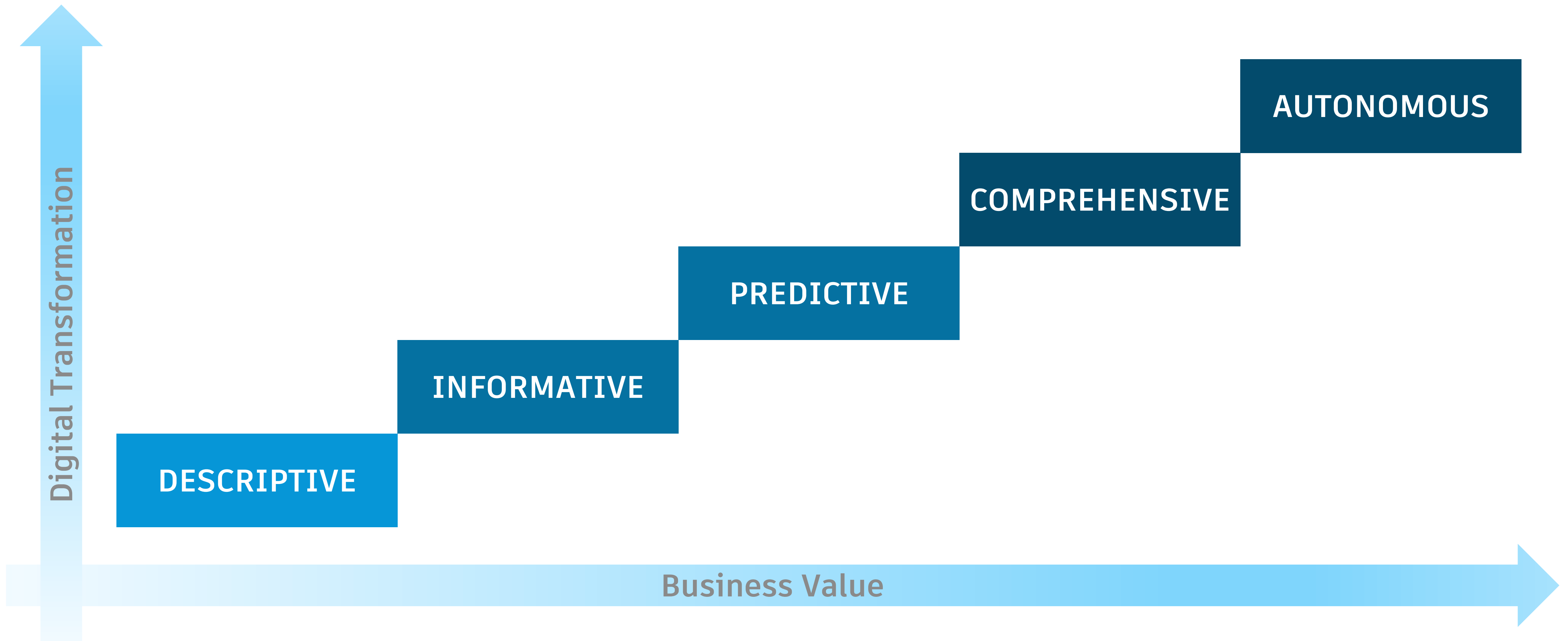




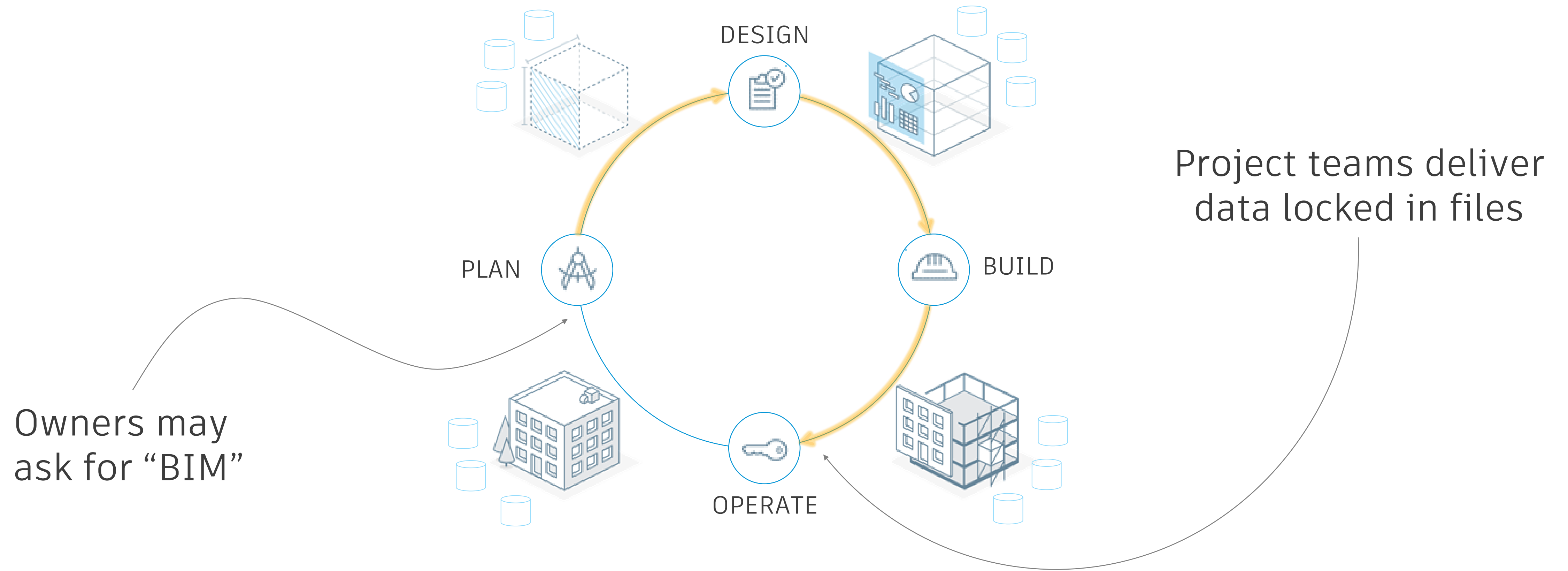
# Transforming the Asset Lifecycle with a Digital Twin



# Digital Twin Maturity Model



# Industry Challenge





# Industry Challenge

Owners receive this...



...when they need this!

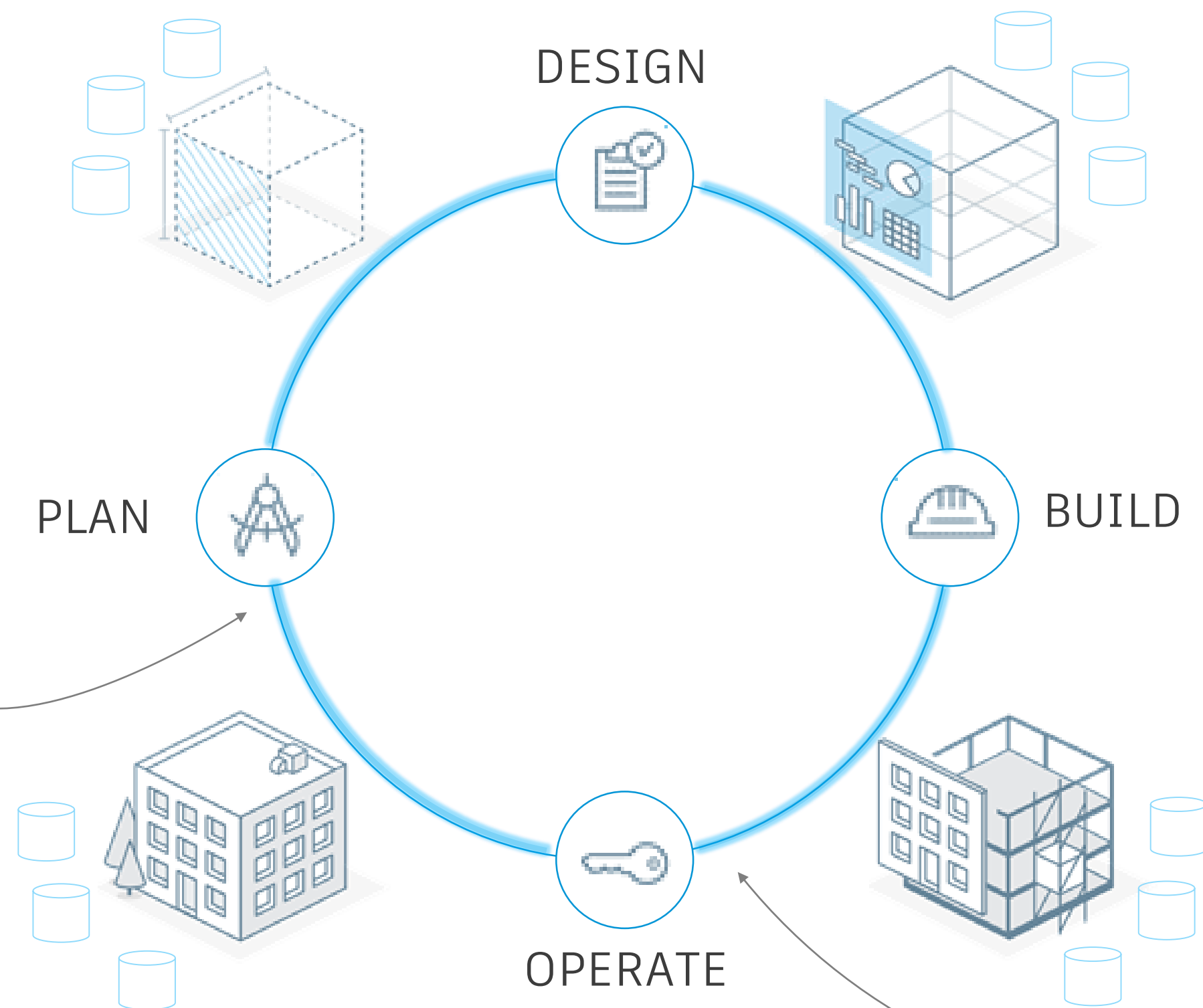




# Industry Challenge

**How do we deliver on BIM's promise of a data-centric workflow?**

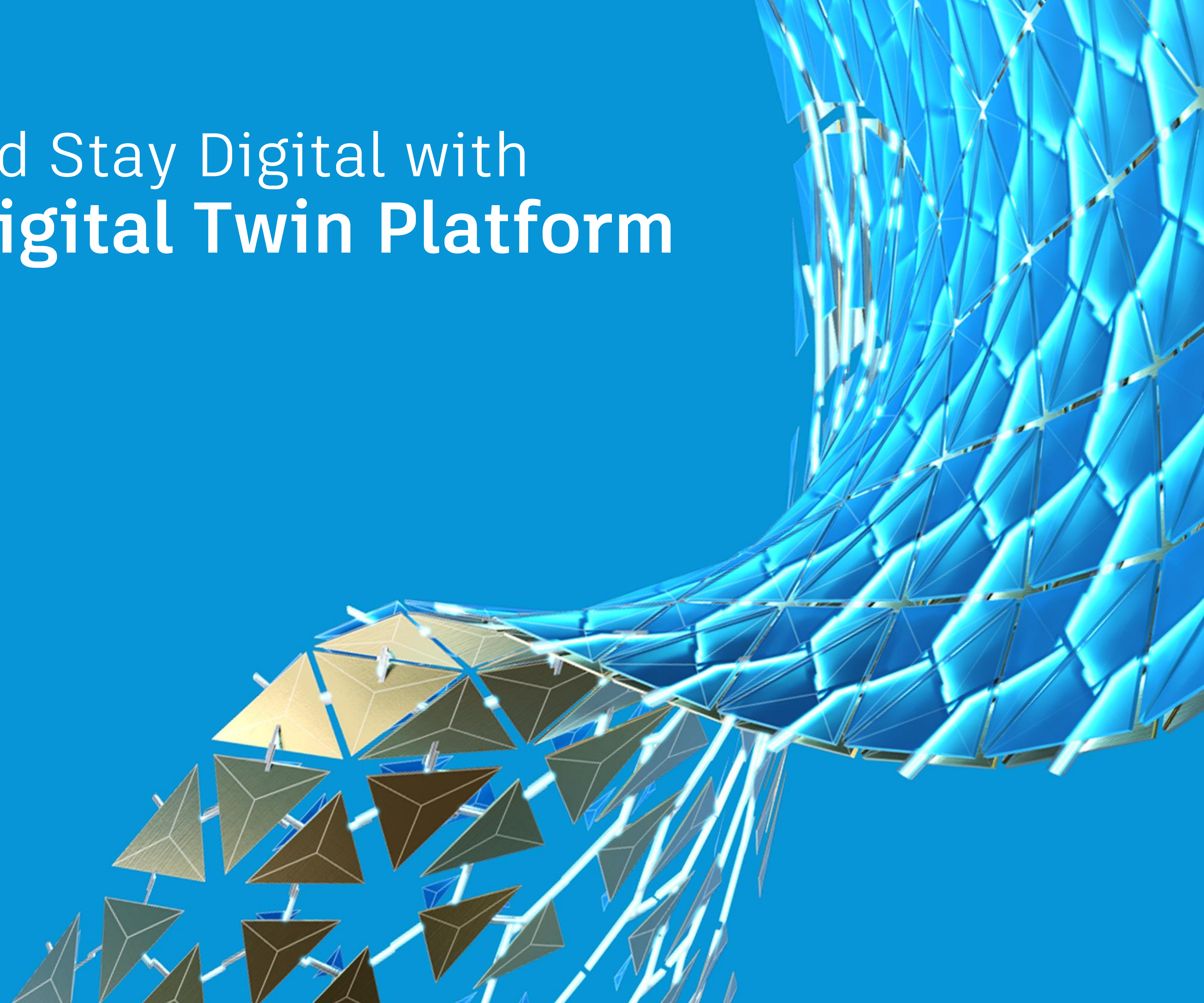
Owners may ask for "BIM"



Project teams deliver data locked in files



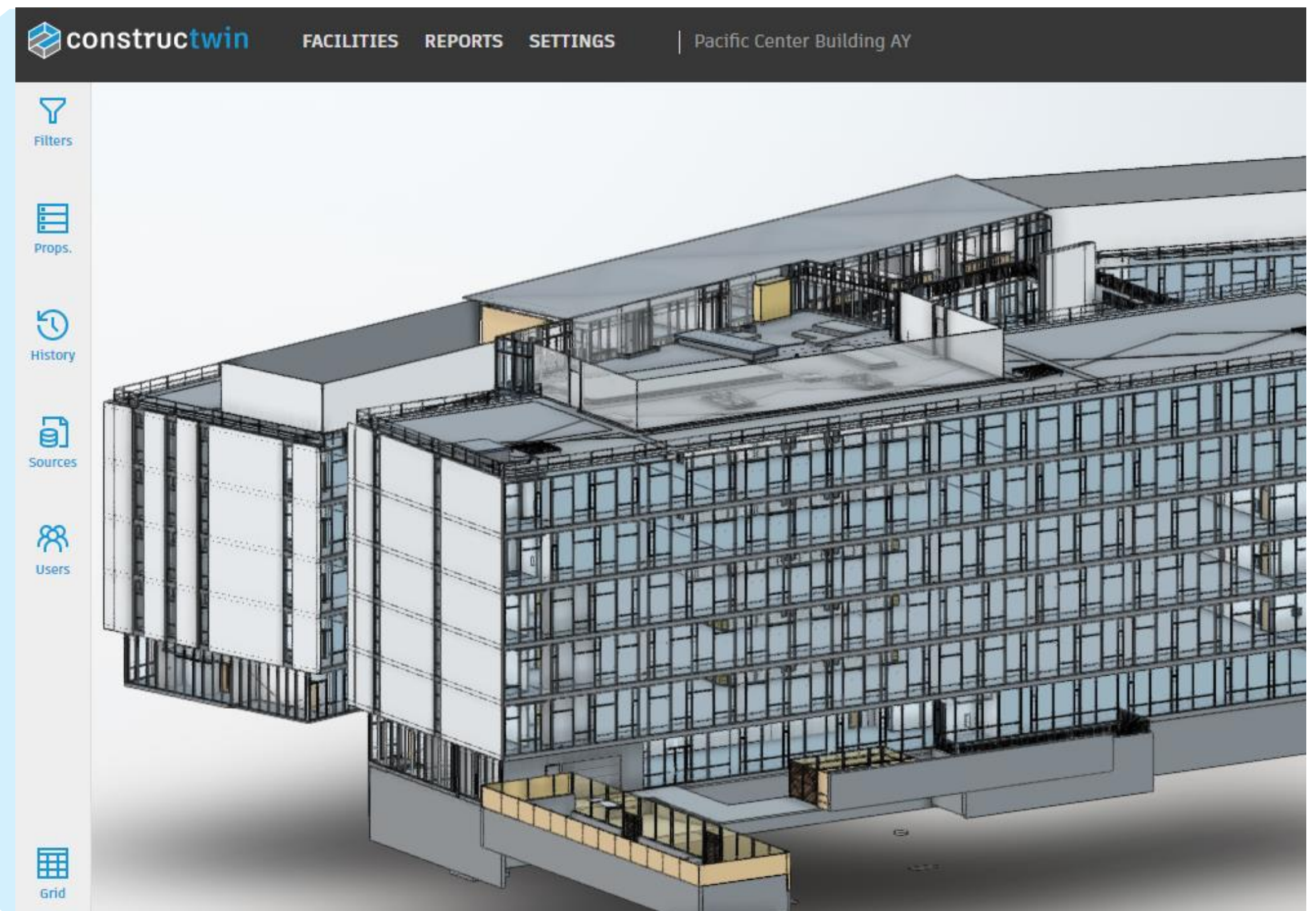
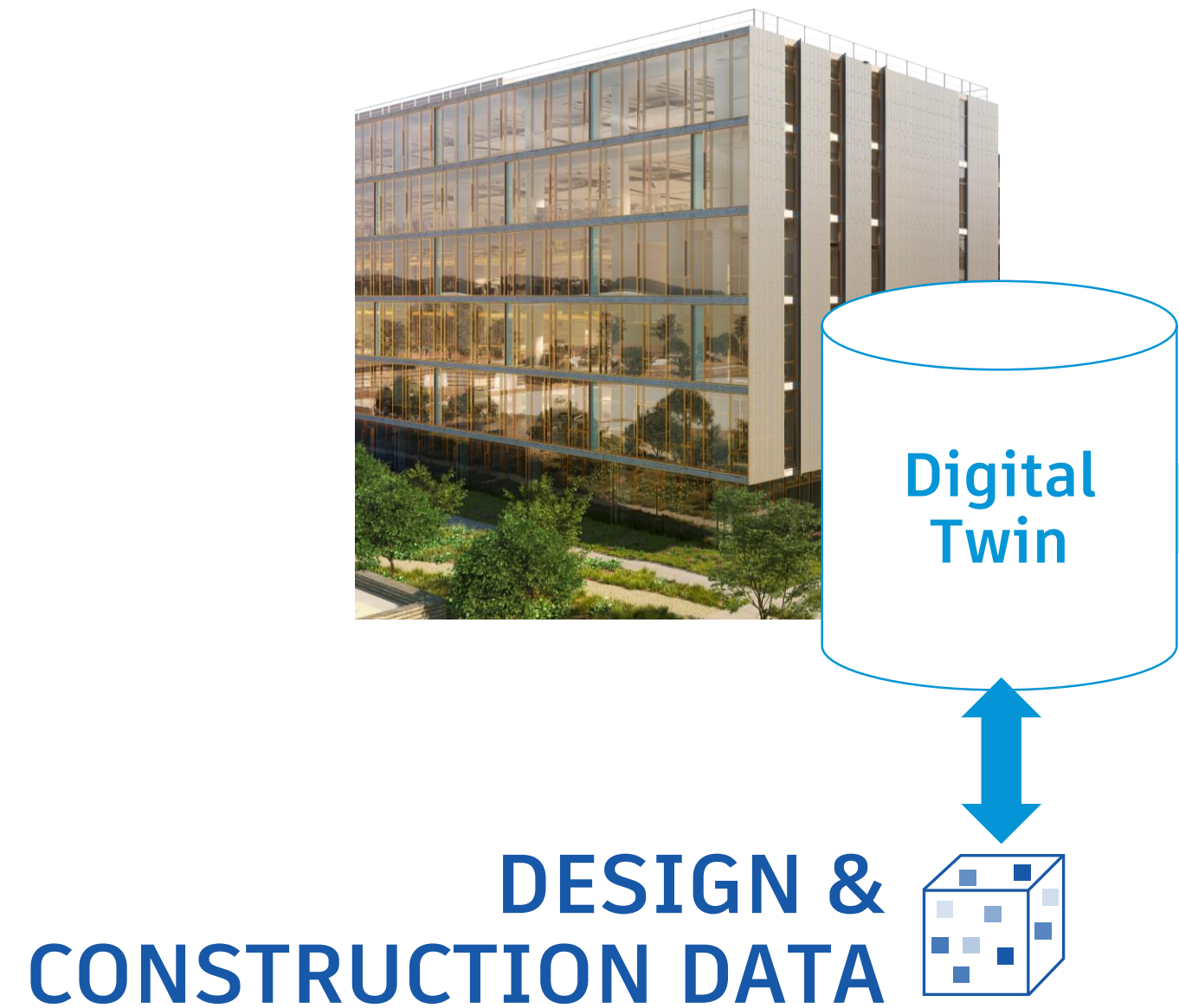
# Start Digital and Stay Digital with **Autodesk's Digital Twin Platform**





# Start Digital and Stay Digital

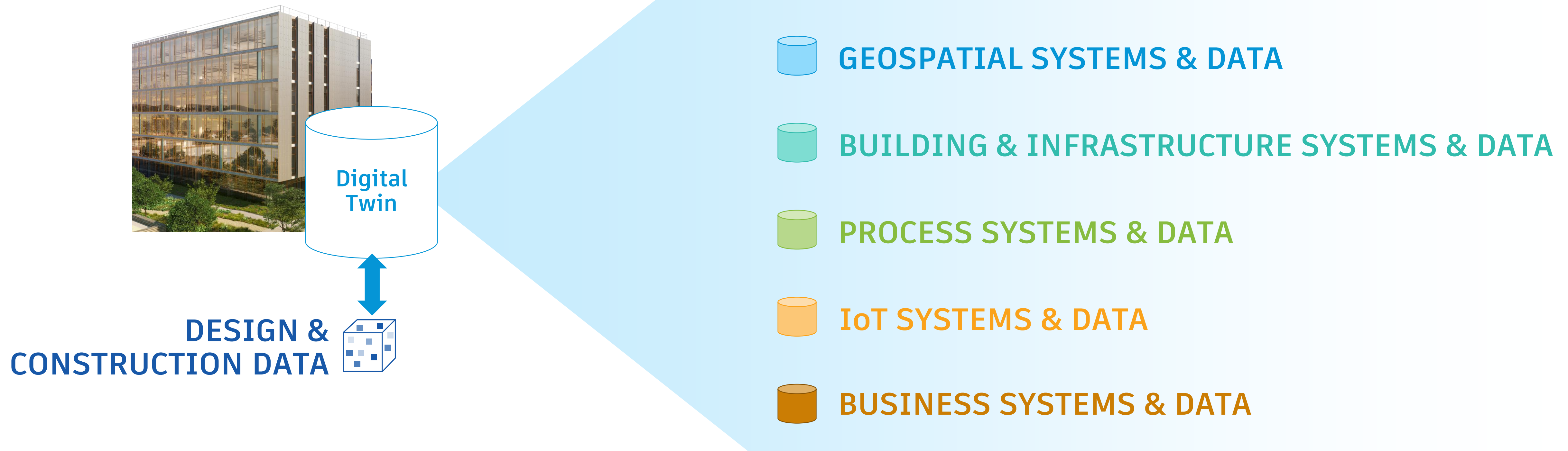
Autodesk **Tandem**<sup>™</sup> will normalize project data and track a **digital thread** of information for each component of a facility from the time it's designed to the day it's decommissioned





# Start Digital and Stay Digital

Autodesk **Tandem**<sup>™</sup> is a **digital hub** that can integrate with new and existing systems to connect the digital model to the operational and performance data of its physical counterpart

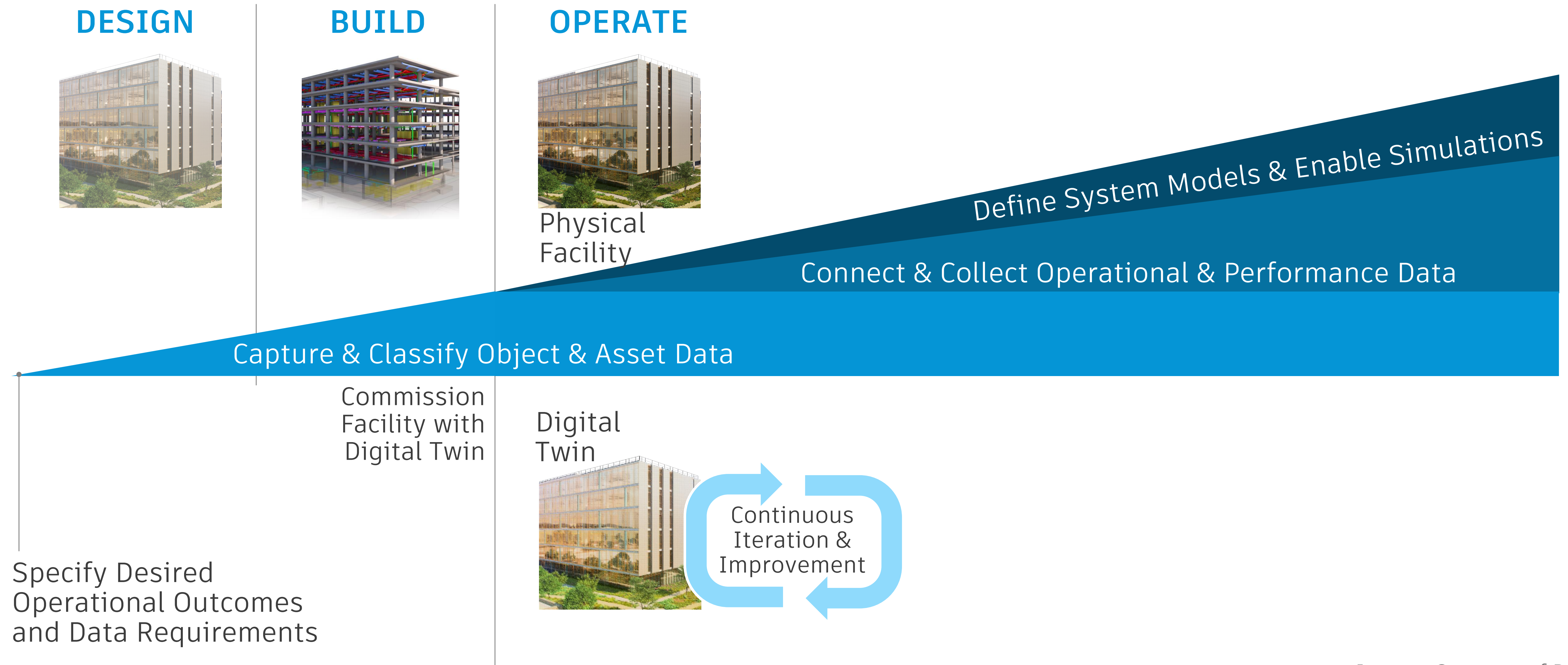








# Enabling a Digital Twin Lifecycle – New Facility





# Enabling a Digital Twin Lifecycle – Existing Facility

## OPERATE



Physical Facility

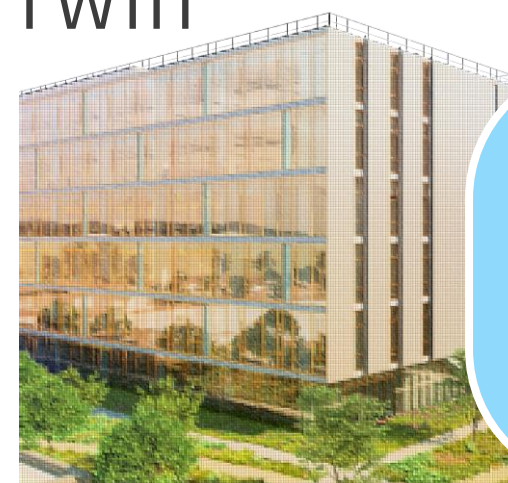
Scan & Model  
as built Facility



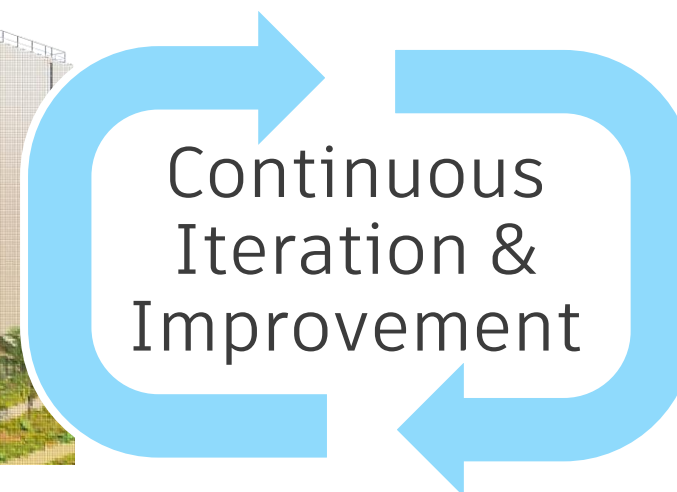
Capture & Classify Object & Asset Data

Commission  
Digital Twin

Digital  
Twin



Continuous  
Iteration &  
Improvement



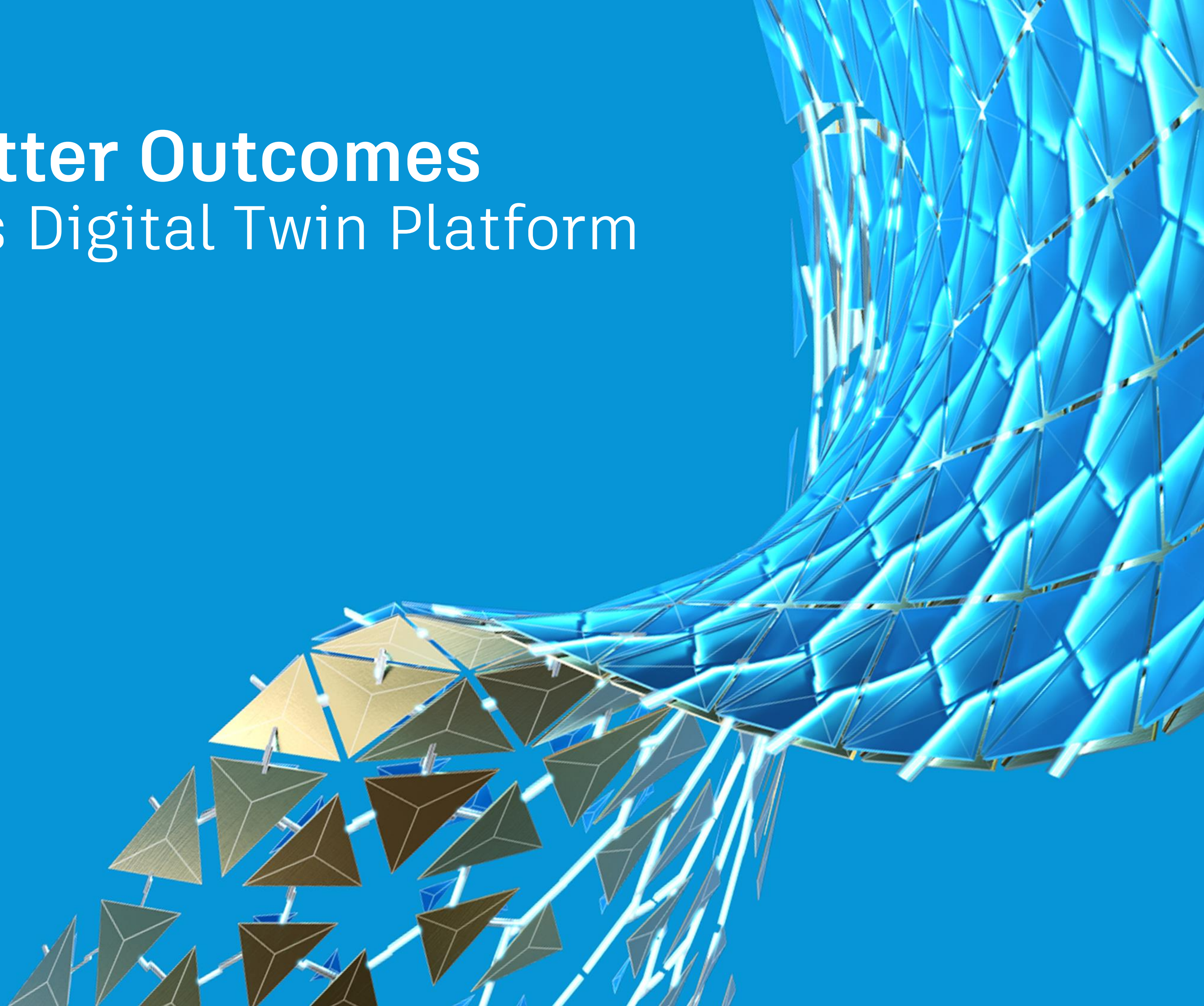
Define System Models & Enable Simulations

Connect & Collect Operational & Performance Data

Specify Desired  
Operational Outcomes  
and Data Requirements

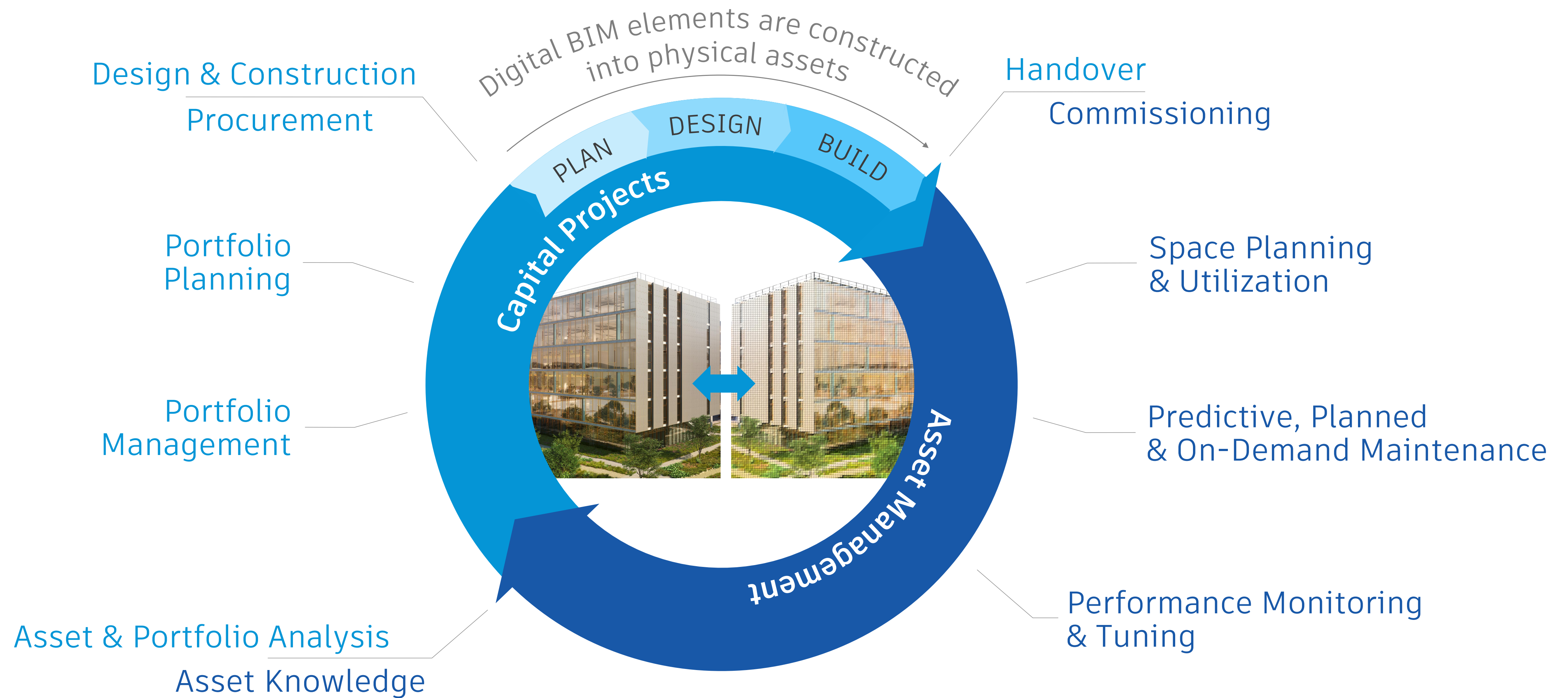


# Achieving Better Outcomes with Autodesk's Digital Twin Platform



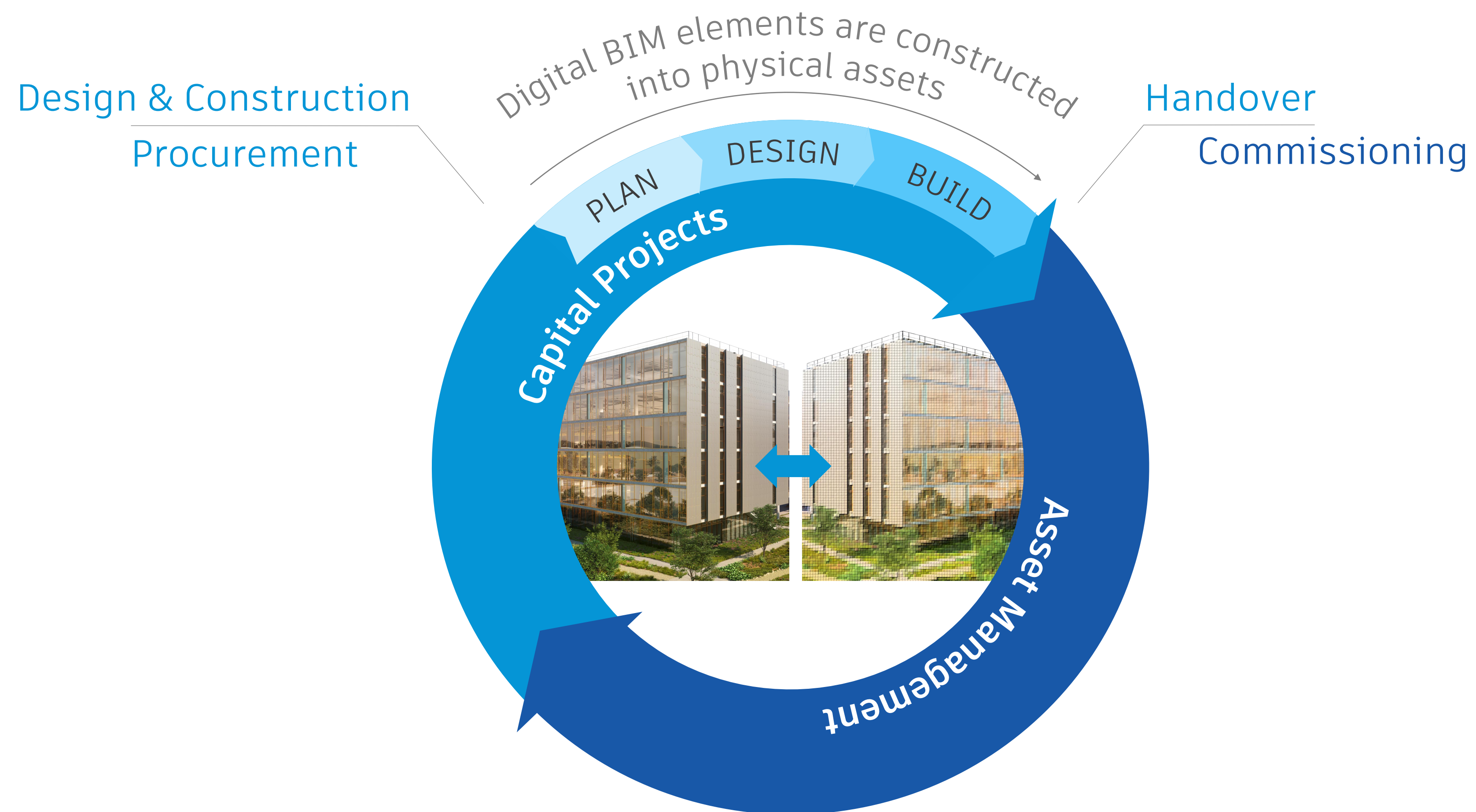


# Digital Handover





# Digital Handover





# Digital Handover



**Capture** and **Verify** the data in Autodesk Tandem during design and construction



**Specify** the desired operational outcomes and data requirements in Autodesk Tandem



**Commission** the facility and leverage Autodesk Tandem to accelerate operational readiness

Design & Construction  
Procurement

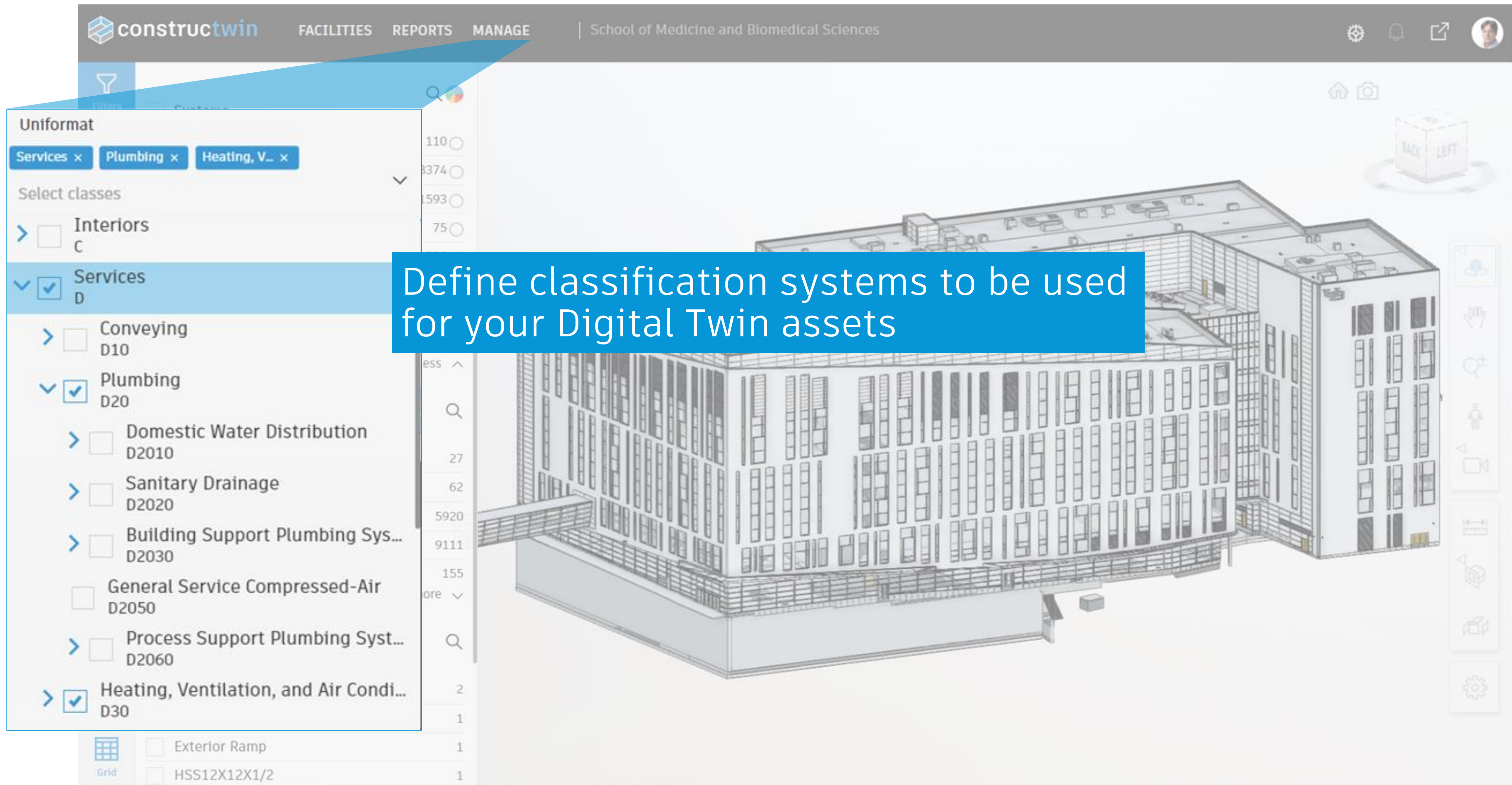
Digital BIM elements are constructed into physical assets

Handover  
Commissioning





# Digital Handover – Specify





# Digital Handover – Specify

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School of Medicine and Biomedical Sciences

Filters

Props.

History

Sources

Users

Reports

Grid

COBie Pumps

DeleteResetRead Only

Name	Data type	Measure	Unit	Symbol	Precision	Description	Restricted?
Name	Text	-	-	-	-	Common Name and Location	<input type="checkbox"/>
Type	Text	-	-	-	-		<input type="checkbox"/>
Specification Set	Text	-	-	-	-		<input type="checkbox"/>
Location	Text	-	-	-	-	Space Name	<input type="checkbox"/>
Current	Integer	Current	Amper	A	-	Amps	<input type="checkbox"/>
Volts	Integer	Power	Volt a	VA	-	Volts	<input type="checkbox"/>
Frequency	Integer	Frequ	Hertz	Hz	-	Hertz	<input type="checkbox"/>
Flow Rate	Integer	Flow	Liters	L/s	-	Flow Rate	<input type="checkbox"/>

Define the parameters to be captured for specific asset types within your Digital Twin



# Digital Handover – Capture and Verify

The screenshot displays the Constructwinn platform interface. On the left, a sidebar contains navigation icons for Filters, Props., History, Sources (highlighted), Users, Reports, and Grid. The main content area is divided into two panels. The left panel, titled 'DATA SOURCES', lists various building components and their corresponding RVT files, all updated 1 month ago. The right panel shows a 3D architectural rendering of a multi-story building with a grid of windows. A blue text box is overlaid on the right side of the interface.

Category	File Name	Updated
Core Structure	SBSMBS-HOK-CORE-STRUCTURE-central.rvt	Updated 1 month ago
Furniture	SBSMBS-Furniture-Central.rvt	Updated 1 month ago
HVAC	SBSMBS-RGV_MEP-Central_V14.rvt	Updated 1 month ago
Interior	SBSMBS-HOK-I-central.rvt	Updated 1 month ago
Lighting	SBSMBS-HOK-C-L-central.rvt	Updated 1 month ago
Plumbing	SBSMBS-RGV-P-Central_V14.rvt	Updated 1 month ago
Shell	SBSMBS-HOK-Shell-central.rvt	Updated 1 month ago
Site	SBSMBS-HOK-L-central.rvt	Updated 1 month ago

Aggregate data from multiple federated sources into your Digital Twin

Model Courtesy of HOK



# Digital Handover – Capture and Verify

The screenshot displays the Constructwinn software interface. On the left, a sidebar contains navigation icons for Filters, Props., History, Sources, Users, Reports, and Grid. The main area features a 3D model of a building's mechanical systems, including pipes and red pumps. A semi-transparent filter overlay is positioned in the center, listing various categories and their counts. The 'Floors' section includes 'PLATFORM' (640), 'BASEMENT 2' (14829), 'BASEMENT 1- ZONING PL...', 'MSK-006 - RISER DIAGRA (CAD LINK MODEL)', and 'NFTA SUBSTATION' (72). The 'Systems' section includes 'B. Shell' (1), 'D20. Piping' (7973), 'D30. HVAC' (17003), 'D40. Fire' (1), and 'D50. Electrical' (3752). A blue text box is overlaid on the filter, stating: 'Filter to display and interact with specific spaces and assets in your Digital Twin'.

constructwinn

medical Sciences

Filter to display and interact with specific spaces and assets in your Digital Twin

**Floors**

- ☐ PLATFORM 640
- ☒ BASEMENT 2 14829
- ☐ BASEMENT 1- ZONING PL...
- ☐ MSK-006 - RISER DIAGRA (CAD LINK MODEL)
- ☐ NFTA SUBSTATION 72

more ▾

**Systems**

- ☐ B. Shell 1
- ☒ D20. Piping 7973
- ☒ D30. HVAC 17003
- ☐ D40. Fire 1
- ☐ D50. Electrical 3752

more ▾



# Digital Handover – Capture and Verify

The screenshot displays the Constructw@re software interface. On the left is a vertical navigation menu with icons for Filters, Props., History, Sources, Users, Reports, and Grid. The main area shows a table titled "COBie Pumps" with columns for various parameters and their values.

COBie Pumps	
BasisOfDesign-Manufacturer	Bell & Gossett
BasisOfDesign-ModelNumber	
BasisOfDesign-Notes	
Churn Pressure	10
Controller Type	
Current	50 A
Flow Rate	2015 L/s
Frequency	0 Hz
Location	Basement 2
Name	Pump 5
Spacial Placement	
Specification Set	
Type	Double Suction Centrifugal Pumps
Volts	460 VA

A blue callout box with white text is overlaid on the right side of the screen, stating: "Capture and edit parameter data in either the property panel, in tabular format, or in external tools like Microsoft Excel". Below the table, a 3D CAD model of industrial piping and pumps is visible, with one pump highlighted in blue.



# Digital Handover – Capture and Verify

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Classification  
Level BASEMENT 2  
MasterFormat Heating, Ventilati...  
Uniformat Select class  
COBie Pumps  
BasisOfDesign-Manufacturer Bell & Gossett  
BasisOfDesign-ModelNumber e-HSC  
BasisOfDesign-Notes  
Churn P  
Control  
Current  
Flow Ra  
Frequen  
Location  
Name  
Special  
Specific  
Type  
Volts

Capture and edit parameter data in either the property panel, in tabular format, or in external tools like Microsoft Excel

INVENTORY 3 filters Export Import X

Name	Level	MasterFor...	Uniformat	BasisOfDesig...	BasisOfDes...	BasisOfDes...	Churn Pre...	Controller Co	Current	Flow Rate	Frequency
BG-VSX_Double S...	BASEMENT 2	23 00 00	D3040	Bell & Gossett	e-HSC		1034		50	2015	
BG-VSX_Double S...	BASEMENT 2		D3040	Bell & Gossett	e-HSC		1034		50	2015	
BG-VSX_Double S...	BASEMENT 2		D3040	Bell & Gossett	e-HSC		1034		50	2015	
BG-VSX_Double S...	BASEMENT 2		D3040	Bell & Gossett	e-HSC		1034		50	2015	
BG_Base Mounted			D3040				0		0	0	

Double Suction Centrifugal Pumps  
460 VA

BG-VSX\_Double S... BASEMENT 2 D3040 Bell & Gossett e-HSC 1034 50 2015  
BG\_Base Mounted D3040 0 0  
BG\_Base Mounted D3040 0 0



# Digital Handover – Capture and Verify

construct

Filters

Props.

History

Sources

Users

Reports

Grid

Classification

Level

MasterFormat

Uniformat

COBie Pumps

BasisOfDesign-Manufacturer

BasisOfDesign-ModelNumber

BasisOfDesign-Notes

Churn Pressure

Controller Type

Current

Flow Rate

Frequency

Location

Name

Spacial Place

Specification

Type

Volts

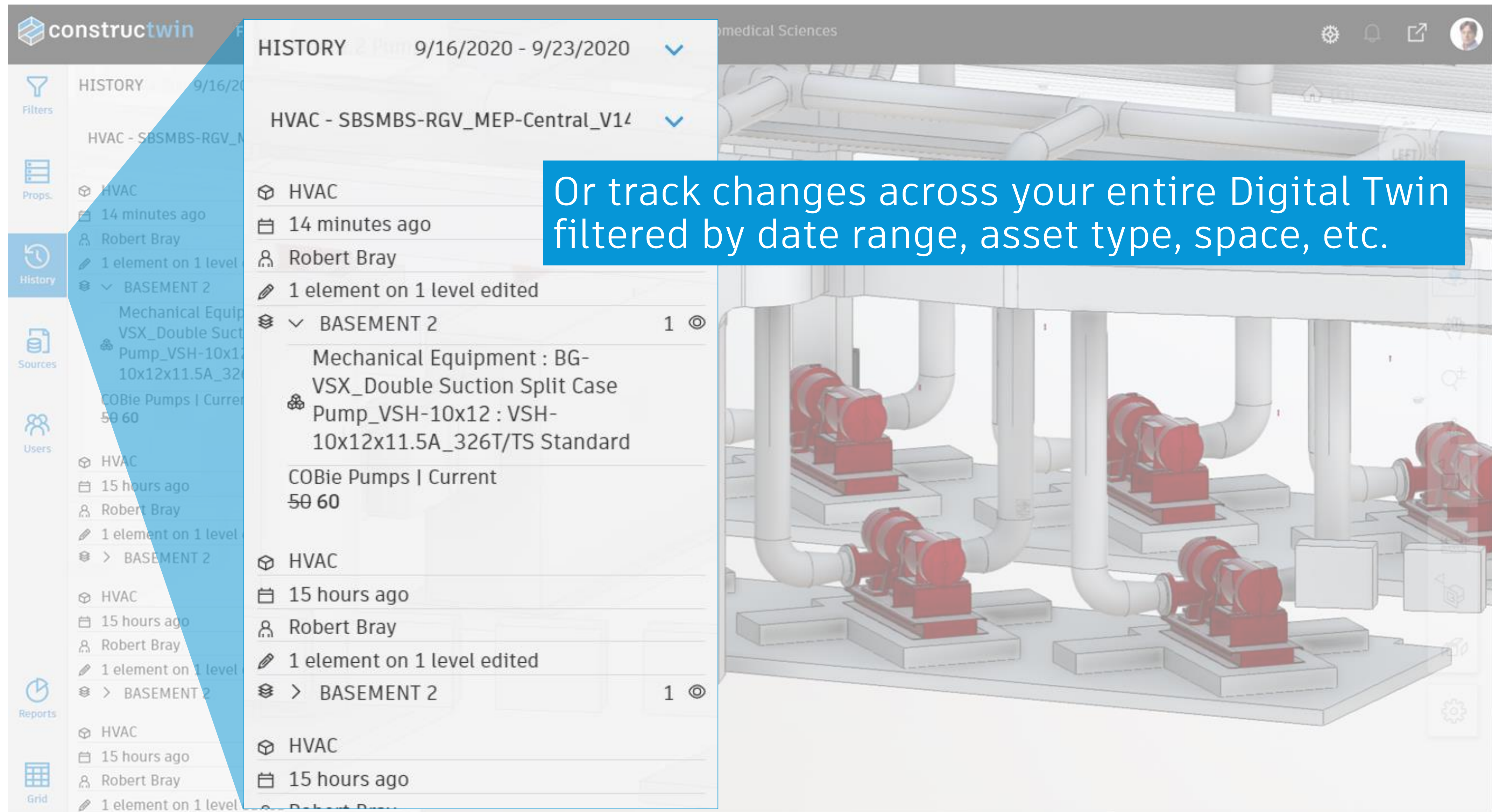
Classification		
Level	BASEMENT 2	Robert Bray 15 hours ago
MasterFormat		
Uniformat	D3040	svc-dt-importer 1 month ago
COBie Pumps		
BasisOfDesign-Manufacturer	Bell & Gossett	Robert Bray 15 hours ago
BasisOfDesign-ModelNumber	e-HSC	Robert Bray 15 hours ago
BasisOfDesign-Notes		
Churn Pressure	1034	Robert Bray 15 hours ago
Controller Type		
Current	60	Robert Bray 2 minutes ago
	50	Robert Bray 15 hours ago
Flow Rate	2015	Robert Bray 15 hours ago
Frequency	0	
Location		

Track changes to your Digital Twin for an individual asset





# Digital Handover – Capture and Verify



The screenshot displays the Constructwinn software interface. On the left is a navigation sidebar with icons for Filters, Props., History, Sources, Users, Reports, and Grid. The main area is divided into a left pane showing a hierarchical tree of assets (HVAC, BASEMENT 2, Mechanical Equipment) and a right pane showing a detailed history log for a selected asset. The history log includes columns for asset type, timestamp, user, and action. A blue callout box is overlaid on the history log, containing the text: "Or track changes across your entire Digital Twin filtered by date range, asset type, space, etc." The background of the interface shows a 3D CAD model of a mechanical room with various pipes, valves, and pumps.

**constructwinn**

HISTORY 9/16/2020 - 9/23/2020

HVAC - SBSMBS-RGV\_MEP-Central\_V14

Or track changes across your entire Digital Twin filtered by date range, asset type, space, etc.

HISTORY

9/16/2020 - 9/23/2020

HVAC - SBSMBS-RGV\_MEP-Central\_V14

HVAC

14 minutes ago

Robert Bray

1 element on 1 level

BASEMENT 2

Mechanical Equipment : BG-VSX\_Double Suction Split Case Pump\_VSH-10x12 : VSH-10x12x11.5A\_326T/TS Standard

COBie Pumps | Current 50 60

HVAC

15 hours ago

Robert Bray

1 element on 1 level

BASEMENT 2

HVAC

15 hours ago

Robert Bray

1 element on 1 level

BASEMENT 2

HVAC

15 hours ago

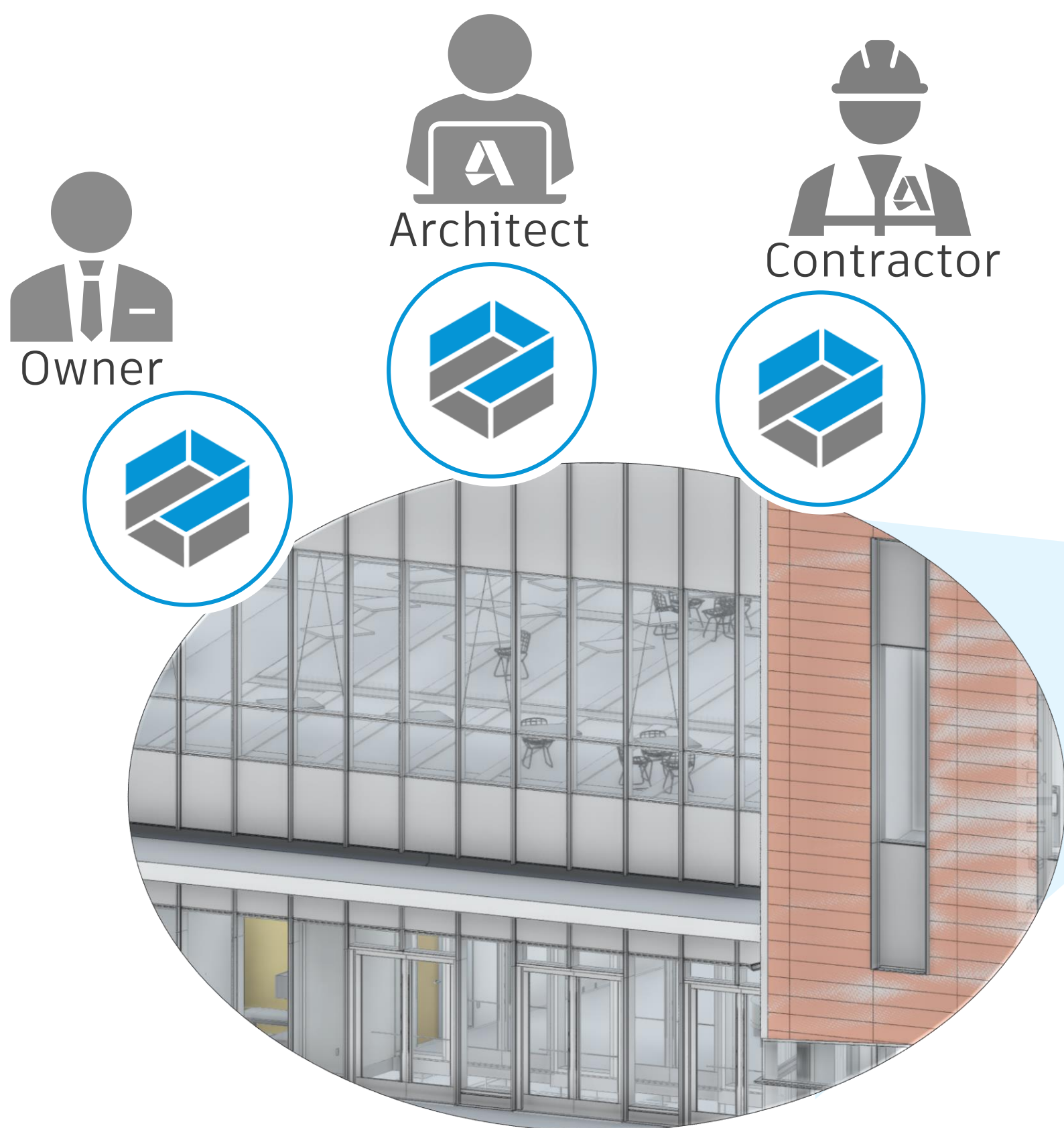
Robert Bray

1 element on 1 level



# Digital Handover

Transparent collaboration to improve decision making and reduce rework



Accelerate operational readiness by providing easy access to detailed facility information





# Together we can Achieve Better Outcomes

## Autodesk **Tandem** Community Program



Monthly  
Webinars



Discussion  
Forums



Quarterly  
Updates







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