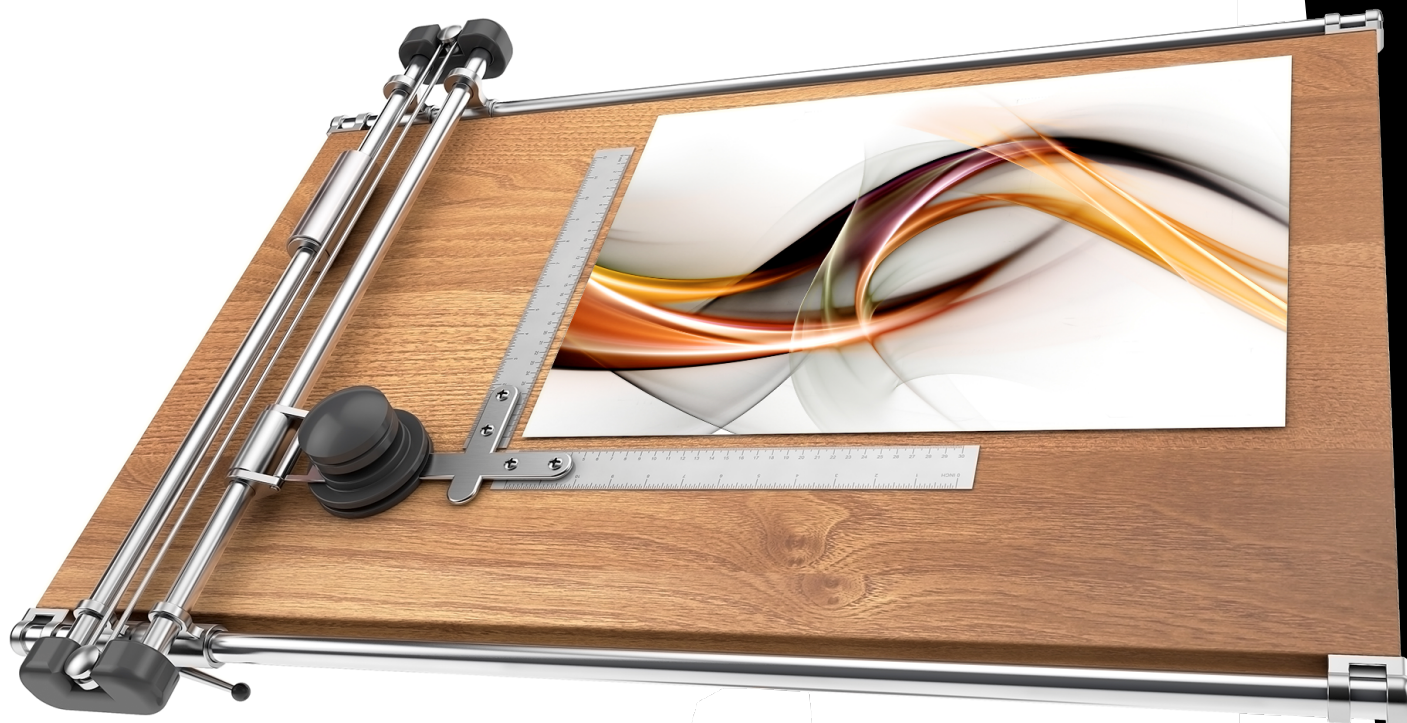# From BIM to Digital Twin for property management

Kort om NTI

- Grunnlagt i 1945

- Pålitelig rådgiver og leverandør til byggenæringen og industrien i snart 80 år

- Fra produsent og leverandør av tegnemaskiner til ledende rådgiver innen bærekraftig digitalisering

- Mer enn 600 ansatte i 8 land

- Hovedkontor i København

- 62 ansatte i Norge

95 %

71 %

82 %

nti · Denmark · Germany · Iceland · Norway · Sweden · The Netherlands · Italy · Spain

Kilde: KPMG

Hva er en «Digital tvilling»

En dynamisk, oppdatert kopi av en fysisk ressurs som samler design, konstruksjon og driftsdata.
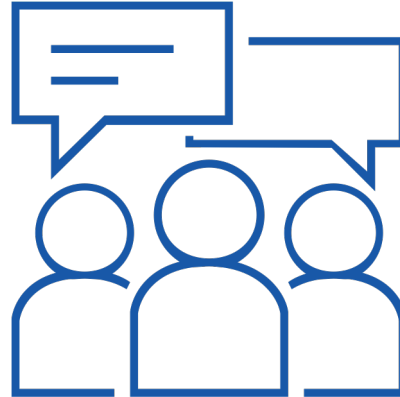
Med tillegg av sanntids operasjonelle data, får digitale tvillinger den adferdsbevissthet som er nødvendig for å simulere, forutsi og informere- før beslutninger tas basert på virkelige forhold.
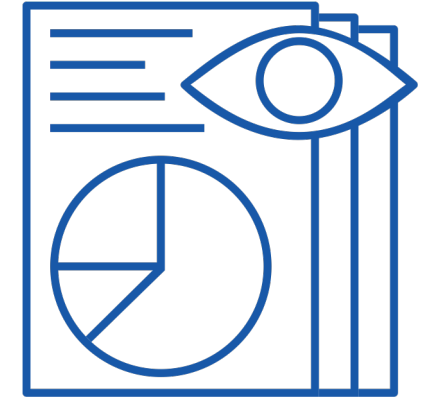
Business mulighet med Tandem for rådgivere

Tilby levering av digital tvilling som en betalt tjeneste

Bygg langvarige kundeforhold med flerårige kontrakter

Få et unikt konkurransefortrinn. Vinn flere kontrakter.

Business mulighet med Tandem for eier

Ta kontroll for å oppnå bedre resultater

Ta kontroll over driftsdokumentasjon

Reduser driftskostnadene

Fremtidssikre eiendommene

Demo
Autodesk
Tandem

Then I want to hand over to

Siva Koppula
Customer Adoption Specialist
AUTODESK **TANDEM**™
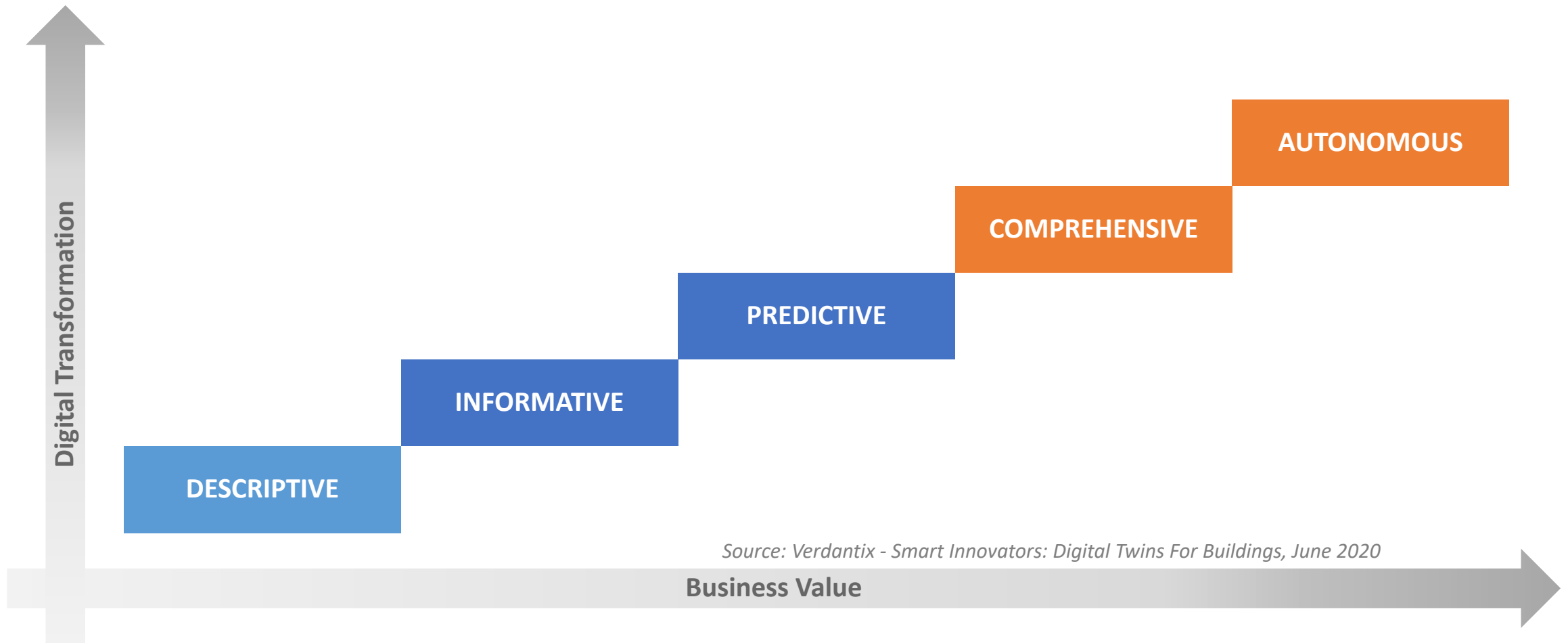
Safe Harbor Statement

The presentations today may contain forward-looking statements about our strategies, products, future results, performance or achievements, financial, operational and otherwise, including statements about our strategic priorities, business model transition, and guidance for the fiscal year 2023 and beyond; our long term financial and operational goals; our M&A strategy; and our capital allocation initiatives. These statements reflect management's current expectations, estimates and assumptions based on the information currently available to us. These forward-looking statements are not guarantees of future performance and involve significant risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from results, performance or achievements expressed or implied by the forward-looking statements contained in these presentations, such as a failure to successfully integrate acquired businesses; developments in the COVID-19 pandemic and the resulting impact on our business and operations; general market, political, economic, and business conditions; complete transitions to new business model and markets; failure of the construction industry to grow as anticipated; failure to develop new products; failure to successfully expand adoption of our products; and failure of product changes to have the desired benefits.

A discussion of factors that may affect future results is contained in our most recent Form 10-K and Form 10-Q filings available at www.sec.gov, including descriptions of the risk factors that may impact us and the forward-looking statements made in these presentations. The forward-looking statements made in these presentations are being made as of the time and date of their live presentation. If these presentations are reviewed after the time and date of their live presentation, even if subsequently made available by us, on our website or otherwise, these presentations may not contain current or accurate information. We disclaim any obligation to update or revise any forward-looking statement based on new information, future events or otherwise.

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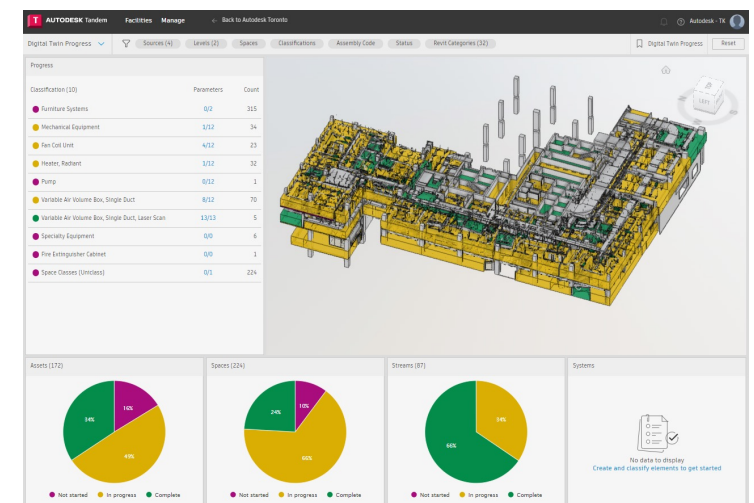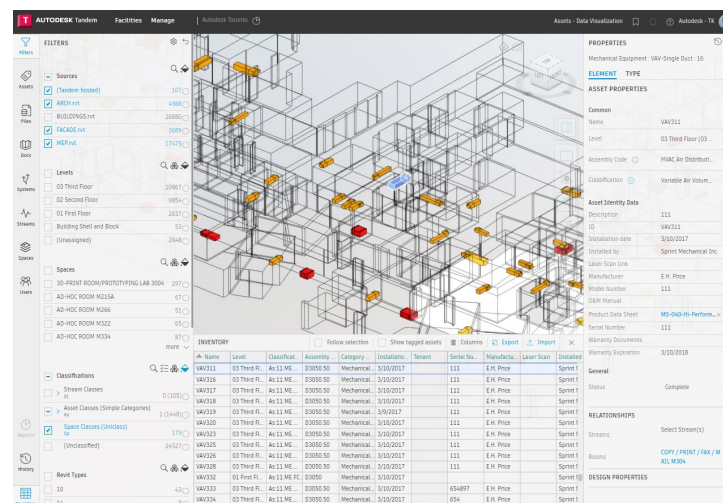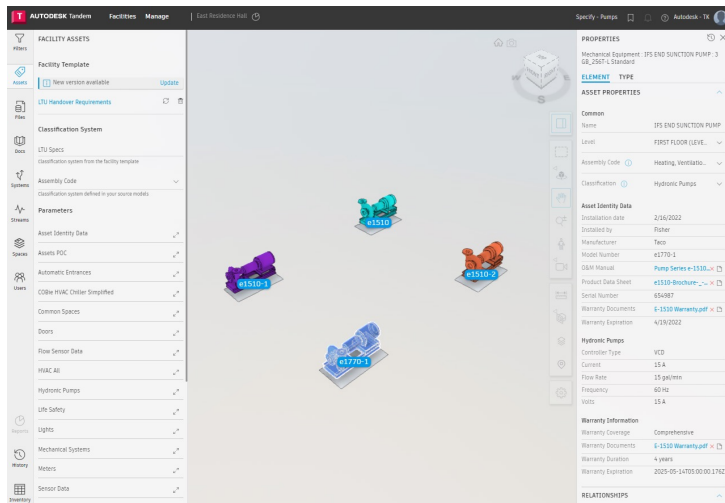
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Digital Twin Maturity

AUTONOMOUS

COMPREHENSIVE

PREDICTIVE

INFORMATIVE

DESCRIPTIVE

Digital Transformation

Business Value

Source: Verdantix - Smart Innovators: Digital Twins For Buildings, June 2020

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Twin Building in Tandem

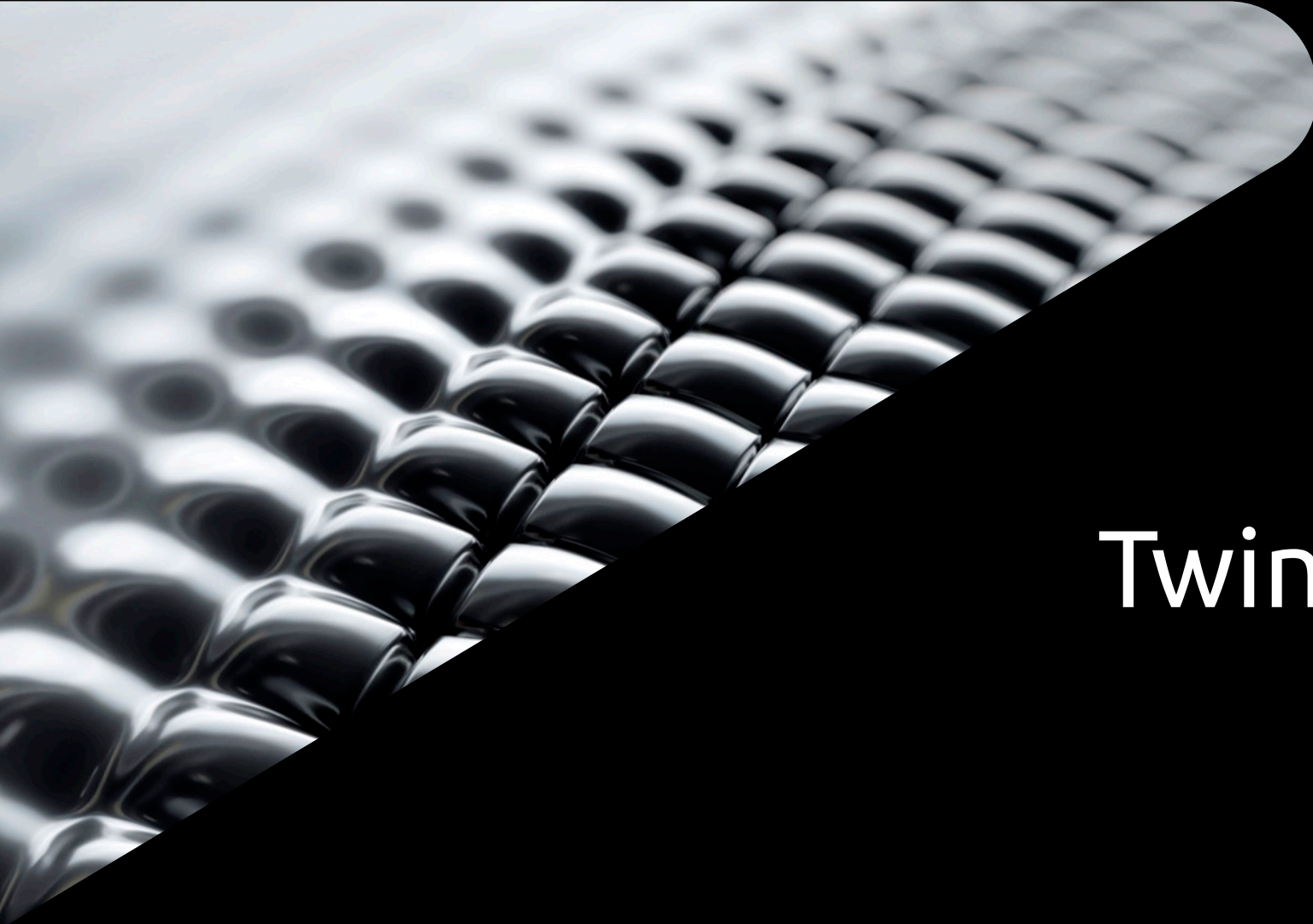**Specify** | **Capture** | **Verify** (Future)

- Establish **data requirements**

- **Structure and organize** the data

- **Identify and define** your assets, spaces, streams and systems

- Create **systems** of assets

- Contribute to the **structured data**

- Establish **relationships** between assets, spaces, systems, streams

- See a **holistic view** of the facility

- Review for **data completion**

- Understand **changes** in your data over time

Twin Building Demo

tandem.autodesk.com/pages/manage

BIM   BIM 360   EDU   Home Imp   DT   Innovation   Data Strategy   Murals   Sunny   SBI   Health   Autodesk   Training   ACC   Tandem

AUTODESK Tandem   Facilities   Manage   ← Back to Sample Facility   Dura Vermeer

CLASSIFICATION SYSTEMS

↓ Download   + Add Classification System

Default (Masterformat) | Code | Description | Level |
|---|---|---|
To add or edit a custom classification system in your account: | > 01 00 00 | General Requirements | 1 |
| | > 02 00 00 | Existing Conditions | 1 |
1. Select an existing classification system and click Download. This exports an editable template. | > 03 00 00 | Concrete | 1 |
2. Open the template in Excel or other spreadsheet app and edit as needed. | > 04 00 00 | Masonry | 1 |
3. Click Add Classification System to create a new system or Update to revise the selected system based on your edits. | > 05 00 00 | Metals | 1 |
| | > 06 00 00 | Wood, Plastics, and Composites | 1 |
| | > 07 00 00 | Thermal and Moisture Protection | 1 |
| | > 08 00 00 | Openings | 1 |
| | > 09 00 00 | Finishes | 1 |
| | > 10 00 00 | Specialties | 1 |
| | > 11 00 00 | Equipment | 1 |
| | > 12 00 00 | Furnishings | 1 |
| | > 13 00 00 | Special Construction | 1 |
| | > 14 00 00 | Conveying Equipment | 1 |
| | > 21 00 00 | Fire Suppression | 1 |
| | > 22 00 00 | Plumbing | 1 |
| | > 23 00 00 | Heating, Ventilating, and Air-Conditioning (HVAC) | 1 |

Specify Asset Data Requirements

tandem.autodesk.com

AUTODESK Tandem

Facilities   Manage

Tandem CAS

OWNED BY Tandem CAS | SHARED WITH ME

Create New Facility

List   Grid

Student accommodation

Project Name:	Lawrence Technology University
Owner:	Autodesk Tandem
Address:	Southfield, MI 48075, Detroit, USA

JKR Hospital

Project Name:	JKR Hospital
Owner:	Autodesk
Address:	Malaysia

IDC9 GYM

Project Name:	IDC9 GYM
Owner:	Intel
Address:	

Plant

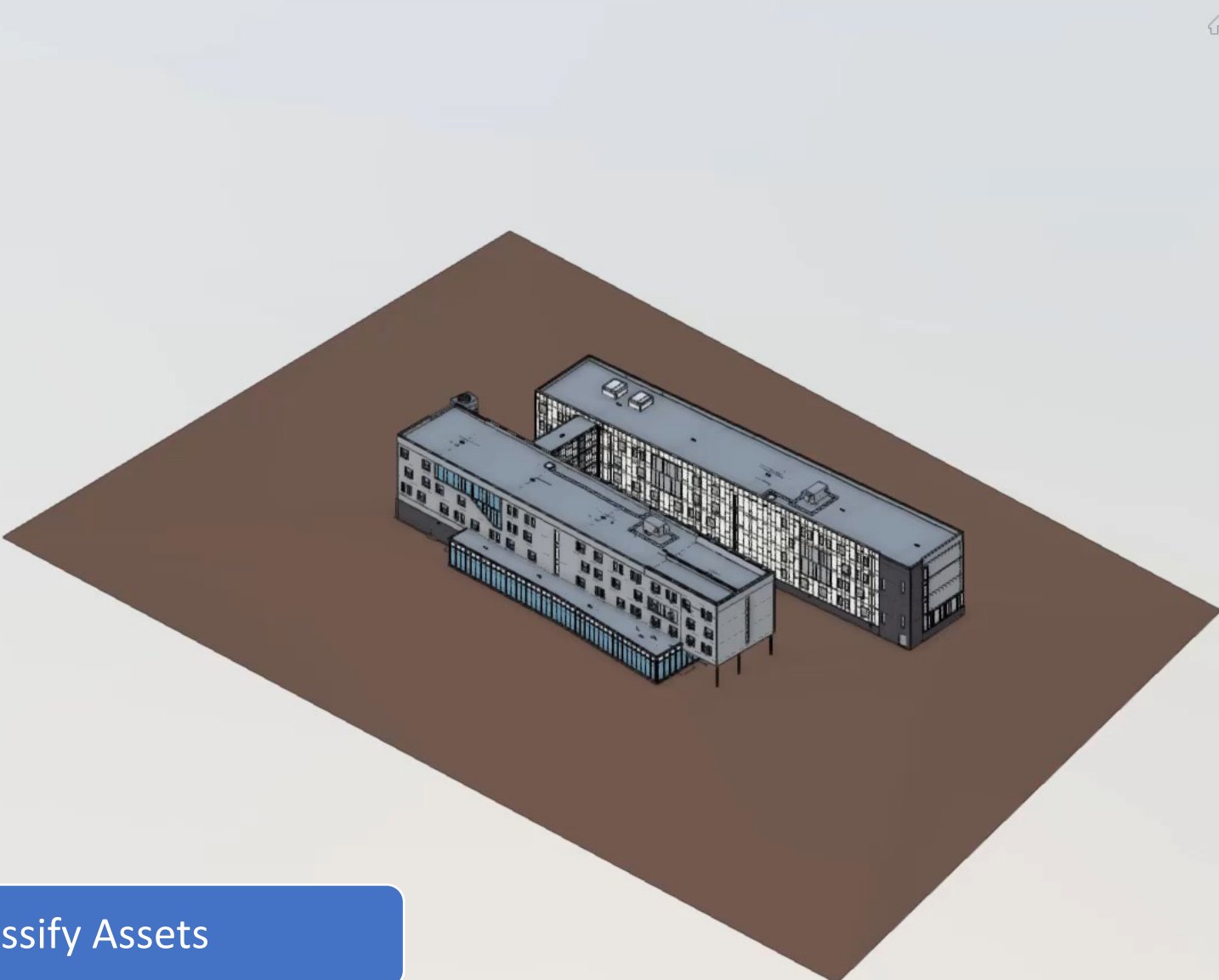|	
Project Name:	Semiconductor Plant
Owner:	
Address:	Germany

Student accommodation

OPEN

Recent Changes   11/7/2022 - 11/14/2022

All Sources

LTU2022 - Arch.rvt
11/10/2022, 12:27:43 AM
Siva Koppula

LTU2022 - MEP.rvt
11/10/2022, 12:27:43 AM
Siva Koppula

LTU2022 - MEP.rvt
11/10/2022, 12:27:08 AM
Siva Koppula

(Tandem hosted)
11/10/2022, 12:27:02 AM
Siva Koppula

LTU2022 - MEP.rvt
11/10/2022, 12:27:01 AM
Siva Koppula

LTU2022 - Structure.rvt

Connect to BIM Data

tandem.autodesk.com/pages/facilities/urn:adsk.dtt:b6gN5-rHRZKa1fm9T2EaTg/views/8v9rE2lCShaGxMApuUacFg

BIM   BIM 360   EDU   Home Imp   DT   Innovation   Data Strategy   Murals   Sunny   SBI   Health   Autodesk   Training   ACC   Tandem

AUTODESK Tandem   Facilities   Manage | Sample Facility

Default View

PROPERTIES

Filters

Assets

Files

Docs

Streams

Users

Reports
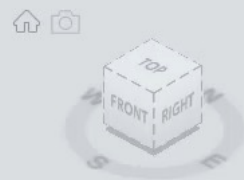
TOP
FRONT   RIGHT

No items selected

Use the left hand panels, viewer, or
inventory table to make a selection

Or

Select elements matching
current filter

History
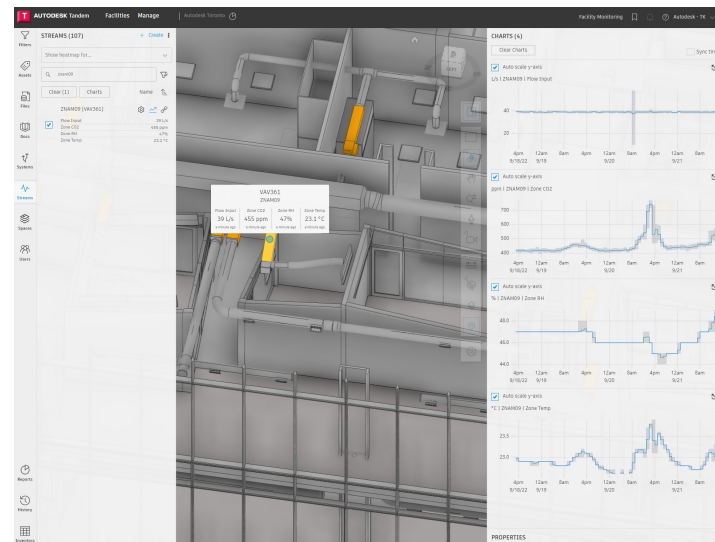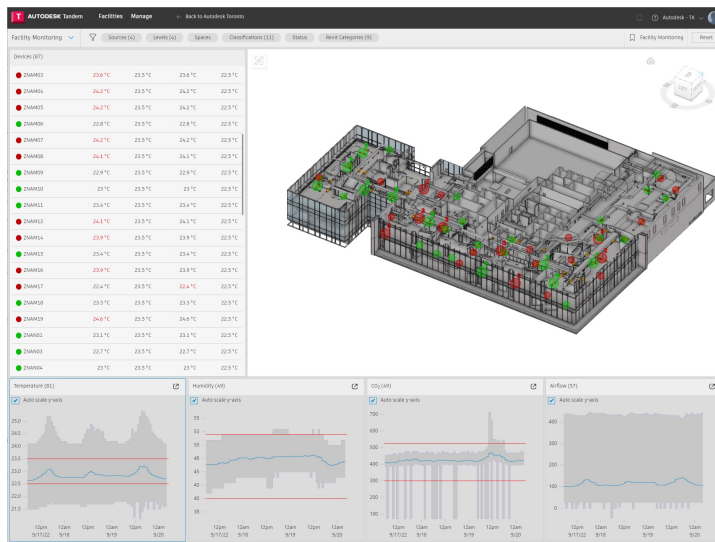
Identify and Classify Assets

Inventory
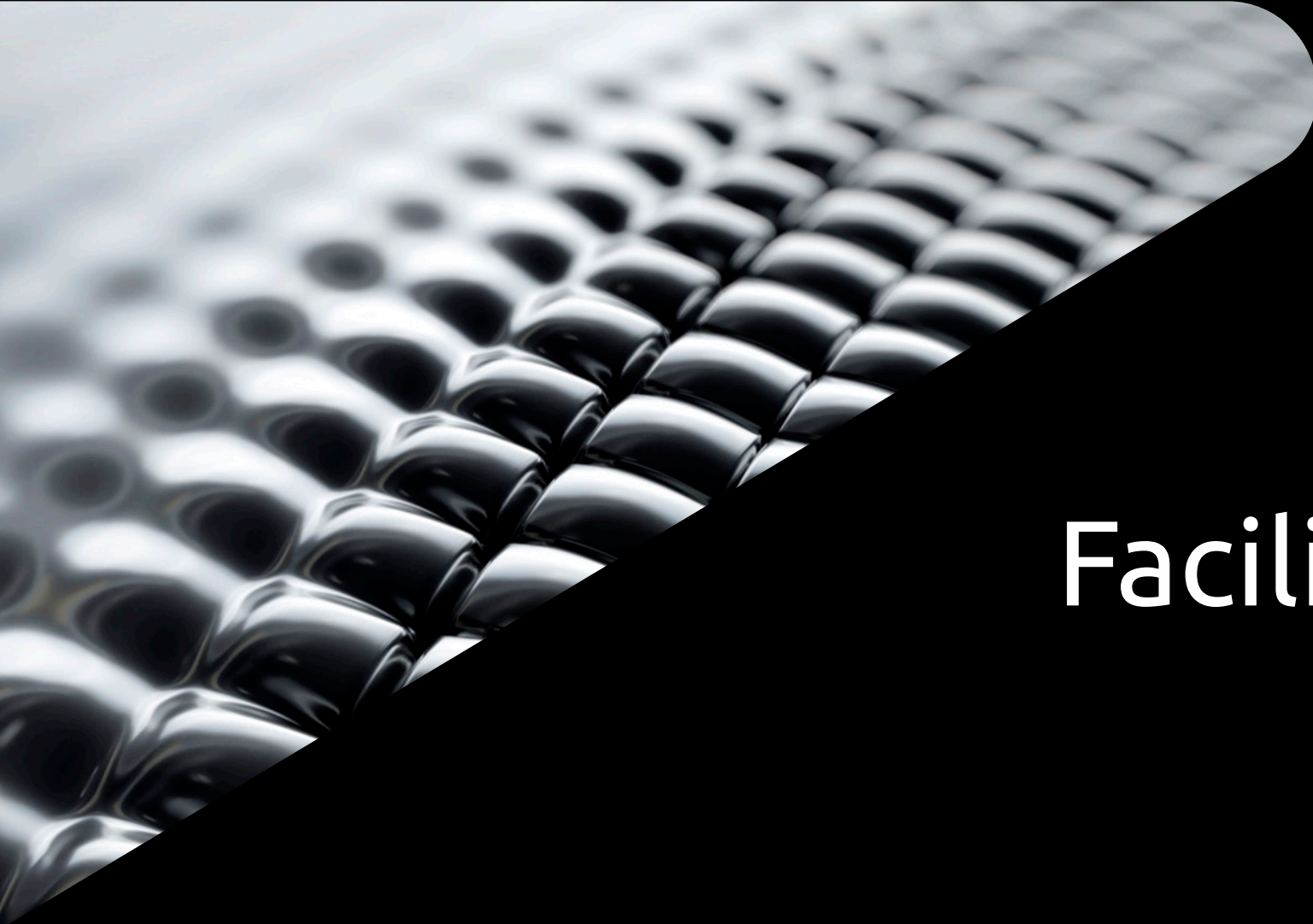
Facility Monitoring

Facility Monitoring in Tandem (beta) coming soon..

| Discover (future) | Investigate | Act |
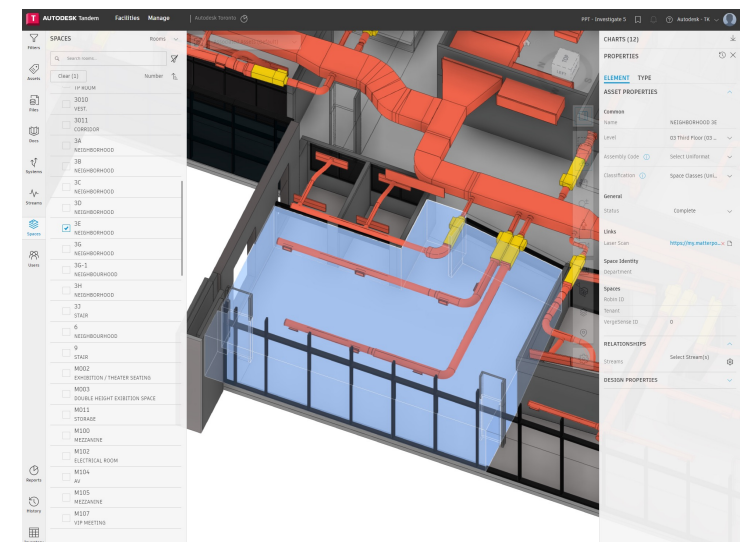
- **Tune in** to what needs attention via **Dashboards**
- **Focus** on what matters most
- Get to **know your facility** from the inside out

- Jump to **the right data** and drill in
- **Trace relationships**, putting any investigation in context
- **Communicate effectively** with your stakeholders

- Turn your **insights into action**
- **Don't waste time** digging for documentation
- Make **informed decisions**

Beta - Create Streams for sensor data

Future – Dashboards for facility monitoring

Benefits

Know your buildings inside out

- Holistic view of building design and current operating performance

- Visualize valuable data generated from smart building technologies

- Collection, connection and contextualization of this data.

Right data at the right time

- Reduce time spent searching for data in disparate systems.

- Act at a moment's notice with building's real-time operations data and historical performance

- Discover assets, spaces, and systems that need your attention

Unlock actionable insights

- Simplify complexity with preconfigured views of the data that matters most

- Dive into data, review heat maps, and analyze figures to draw meaningful conclusions.

- Set goals with confidence, improve operations, and maximize ROI

Autodesk Tandem Roadmap

Now	Next	Later

Twin Building
Descriptive Twin

Facility Monitoring
Informative Twin

Portfolio Optimizing
Predictive Twin
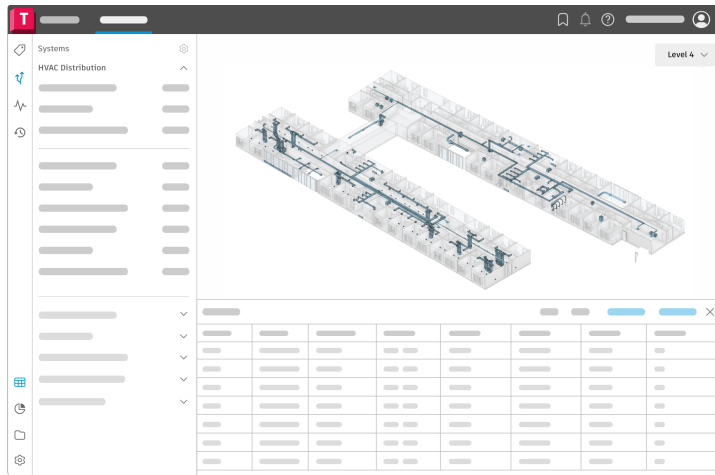
- Structure, gather, manage, and verify facility data
- Automate ontological relationships allowing for refinement
- Integrate operational systems **(BETA SOON)**
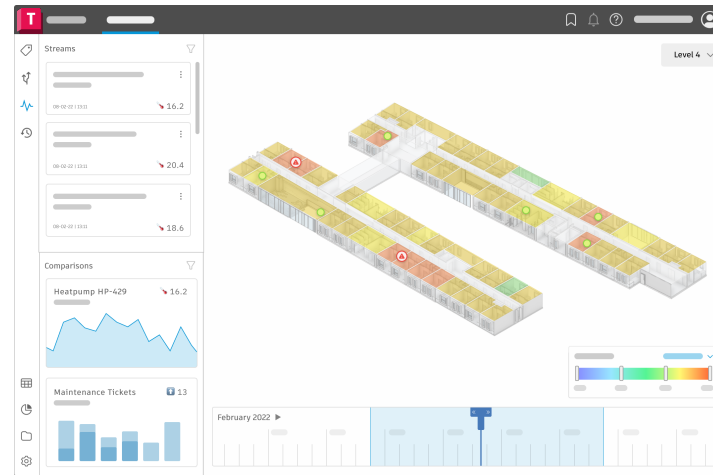
- Simplified user experience for operations **(BETA SOON)**
- Preconfigured views of operations data in context for exploratory analysis **(BETA SOON)**
- Configurable dashboards for actionable insights
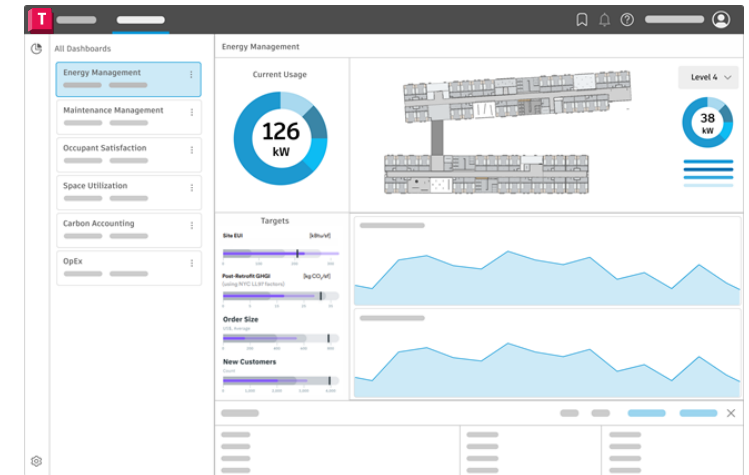
- Ability to roll-up and view data across your portfolio of facilities
- Analytics to predict future events and suggest actions for tuning operational efficiency

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Autodesk Tandem Platform Roadmap

REST API

- Read/Write access to the Asset Information Model
- Append/Query access to Operational Event History, e.g., time-series data

Tandem SDK

- Higher-level API with the digital twin business logic
- Embeddable on the client-side to create a custom digital twin app
- Usable on the server-side in Node.js

Tandem Extensions

- Enable vertical integrations with CMMS/IWMS solutions
- Support custom data analytics on Tandem data

Tandem + Reekoh = Tandem Connect

Connecting IT and OT Data to Tandem

AUTODESK
Tandem

Reekoh
Accelerate Integration
Platform &
Outpost Edge

Maintenance Management
Tickets, Alerts, Schedules, Technicians

Building Management Systems
Building Control Systems, Lighting, Security, Etc.

Space Management
Space Planning, Booking, Occupancy

Performance Management
Utilization, Environment, Energy, Weather, Etc.

Business Systems
Tenant and Portfolio Applications, Etc.

Heatpump HP-429 ↘ 16.2

Maintenance Tickets 13

Getting Started with Autodesk Tandem

It takes just two minutes to sign up for an account—and it's free.

Sign up for free

Stay in touch with the digital twin journey through updates and webinars.

Subscribe now

Autodesk Tandem
A digital twin cloud-based technology solution for AEC firms, Owners & Operators - by Autodesk
Software Development · 1,443 followers

- No User Limits
- No Facility Limits
- Up to 1,000 tagged assets

- Webinar invitations
- Updates on Tandem

- Updates on Tandem
- Webinar invitations
- Digital twin information

intandem.autodesk.com/contact-us/

linkedin.com/autodesktandem/

Hvorfor trenger du en digital tvilling

- Forutsi systemfeil før de oppstår,

- Utføre «hva-hvis»-simuleringer og gi rik innsikt i driften, ytelsen og bruken av den bygde ressursen.

- Koble sammen ulike informasjons- og beslutningssystemer for å ta bort silotenking og tilgjengeliggjøre kritiske data

- Den akkumulerte kunnskapen kan brukes til å planlegge fremtidige prosjekter og forbedre designbeslutninger for bedre ROI.

Tips å ta med

- **Er du eier**
  - Still krav til overlevering av en digital tvilling fra din entreprenør.
  - Det er du som betaler for den flotte modellen som i snitt går 95% ubrukt gjennom livsløpet til dine bygg

- **Er du rådgiver eller entreprenør – se fortetningsmuligheten som ligger her – dette er verdiskapende for alle parter**

- **I et miljøperspektiv må denne næringen ta alvorlige grep og som eier er det å få kontroll på og bruke data aktivt et godt grep på veien til betydelig lavere utslipp og sløseri**

Spørsmål

- Møt oss i utstillingen for en prat og svar på spørsmål
- Der kan også uforpliktende møter bookes

- Takk for oss