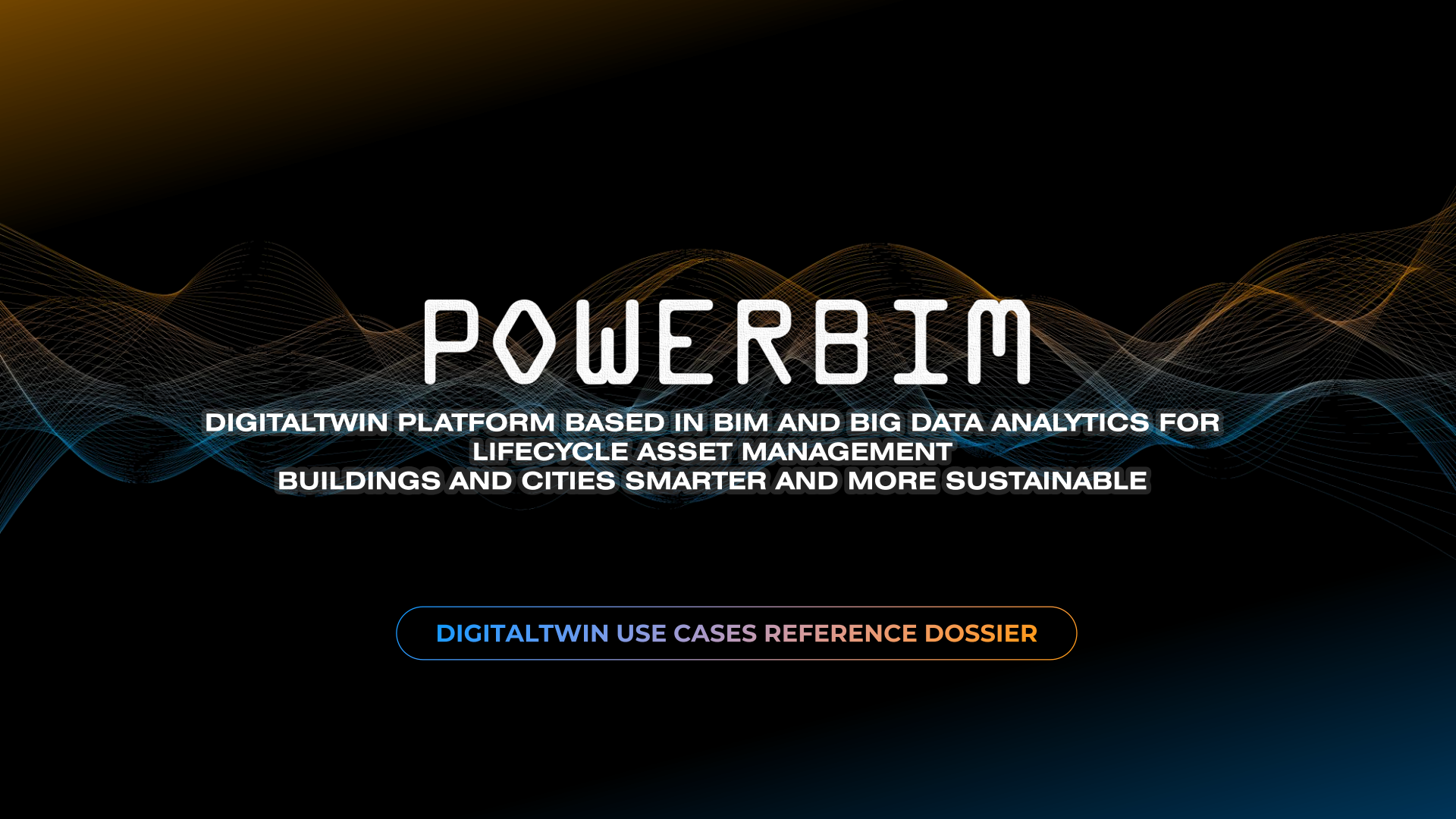


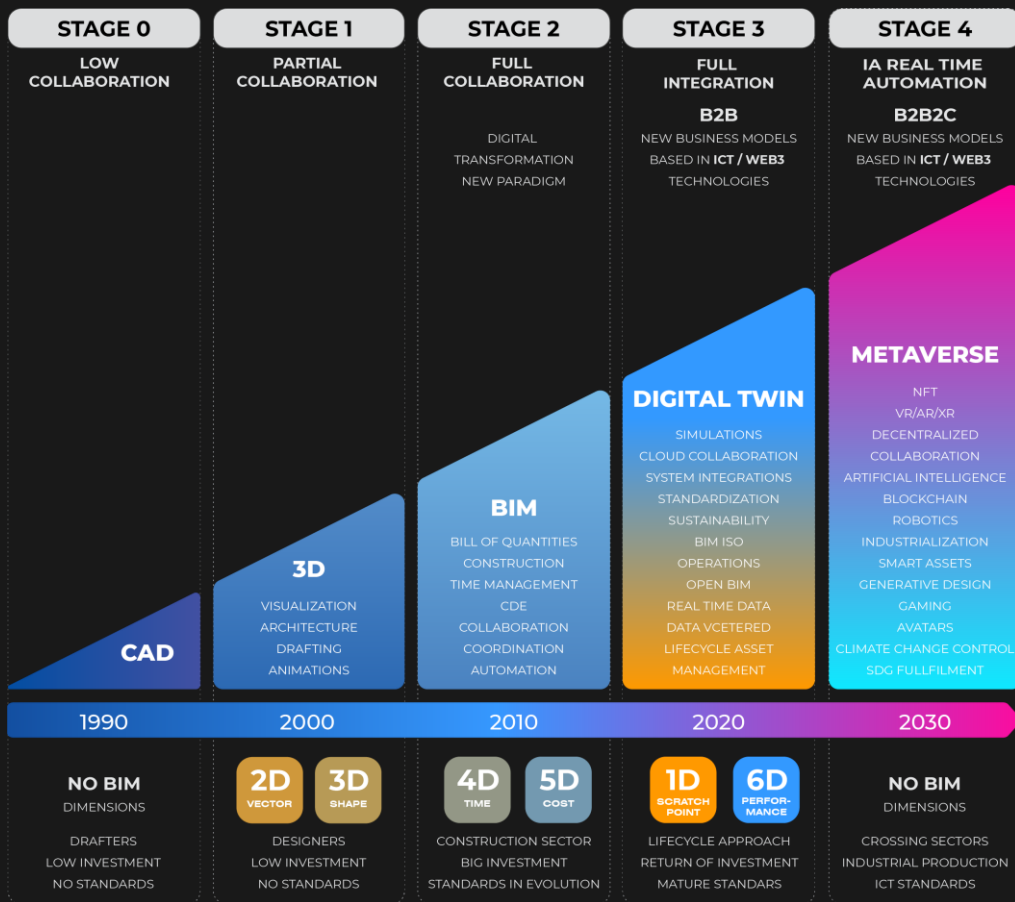


POWERBIM

**DIGITALTWIN PLATFORM BASED IN BIM AND BIG DATA ANALYTICS FOR
LIFECYCLE ASSET MANAGEMENT
BUILDINGS AND CITIES SMARTER AND MORE SUSTAINABLE**

DIGITALTWIN USE CASES REFERENCE DOSSIER

*The information in this dossier belongs to real use cases from clients, and it should be considered as **CONFIDENTIAL***



POWERBIM® *DigitalTwin*

INNOVATION IS EVOLUTION

Our vision is evolutive, BIM
evolves to DigitalTwin
In a similar manner like BIM
evolved from the CAD

A DIGITALTWIN TO IMPROVE KPIS

ASSETS (HVAC Systems, Lighting, space management...)

PROCCESSES (Manteinance, Occupancy Flow...)

INDICATORS (Energy Balance, ROI...)

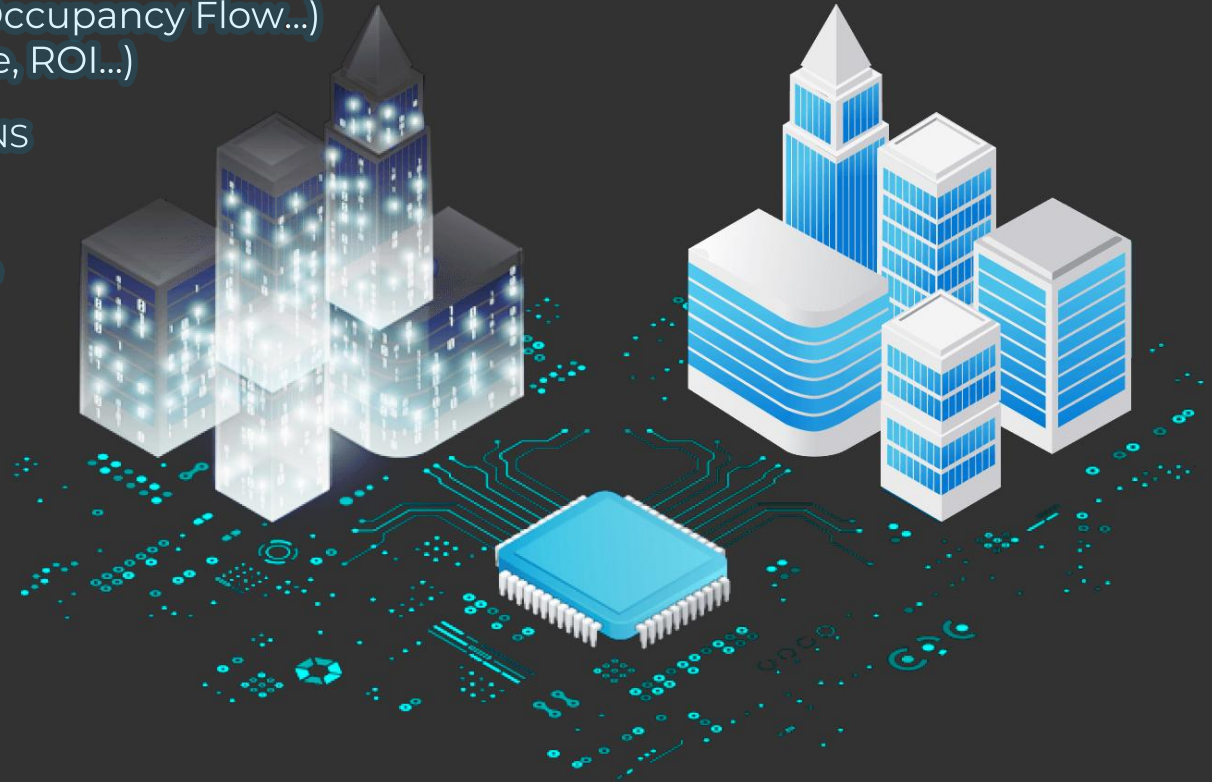
TO BE MANAGED BY DIGITALTWINs

30% Energy Performance

65% CO2 emissions reduction

30% Cost savings

RELIABLE METRICS



DigitalTwins getting goals and are cost effective

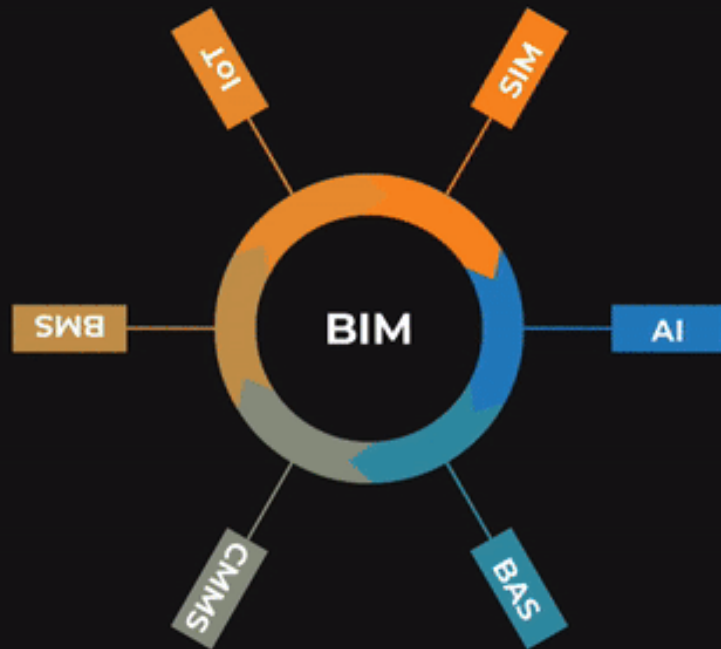
World Economic Forum: Digital Twin technology can help decarbonize cities

StepUP Funded Project: DigitalTwins can improve 65% carbon emissions

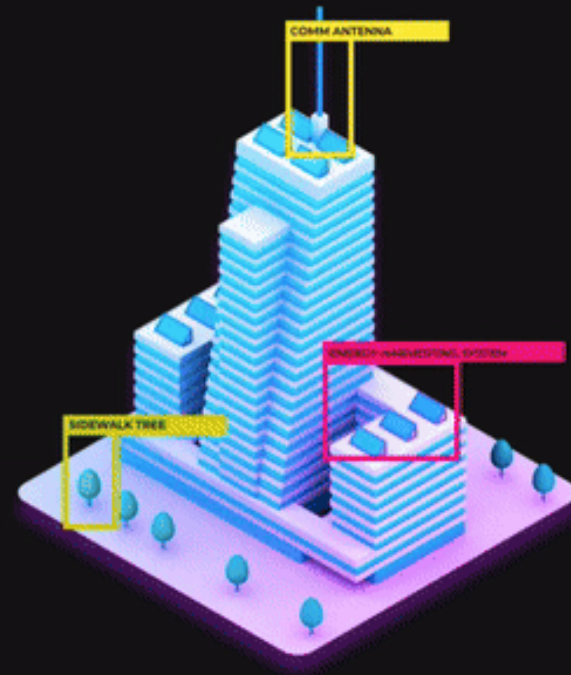
Springer Open Research: DigitalTwins to improve energy efficiency in a 30%

OUR ADDED VALUE IS TO AUTOMATE BIM INTEGRATION

Integrated Technologies



Predictive Simulations
Machine Learning Algorithms
Computer Vision



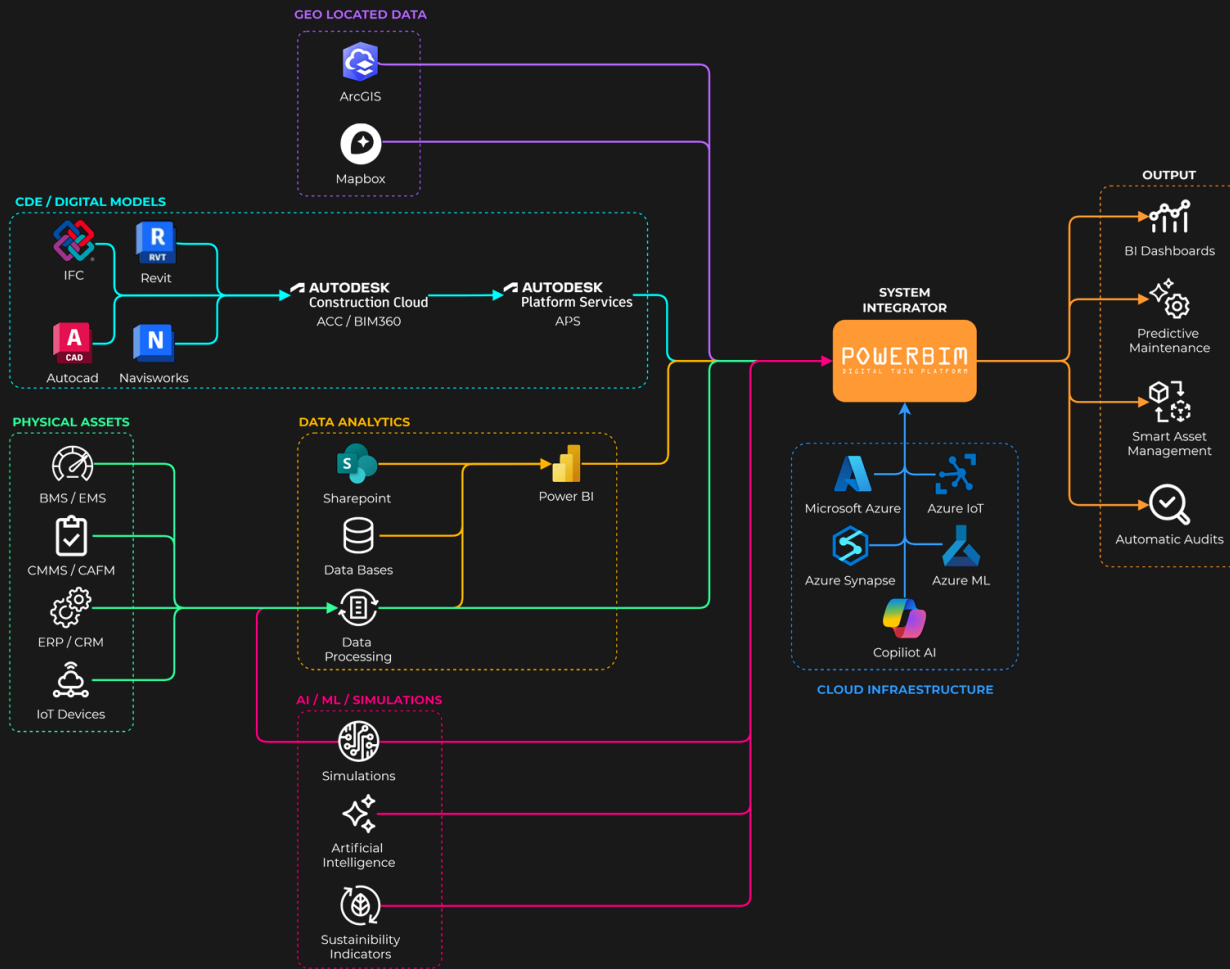
BIM is mandatory
and necessary for building DigitalTwins

PlanRadar: BIM adoption in
Europe

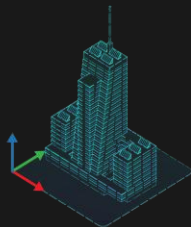
European Commission: Construction
Building Information Modelling

BIM Community: Understanding
ISO 19650

DIGITAL ECOSYSTEM

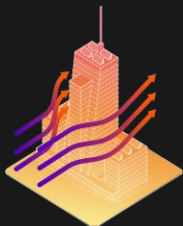


1 DIGITALIZATION



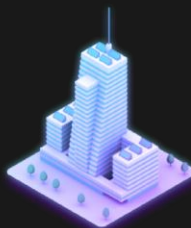
- BIM
- LIDAR
- GIS

2 ENGINEERING



- AI
- Edge Computing
- Calculations & Simulations

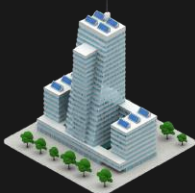
3 DIGITAL-TWIN



- BIM Integration
- Facility Management
- Sustainability
- Technology
- Business Management



0 PHYSICAL ASSET



- Energy Use Optimization
- Space Use Optimization
- Lifecycle Assessment
- Maintenance Cost Optimization
- More control, more revenues

3 STEPS FOR THE “DIGITALTWINNING”





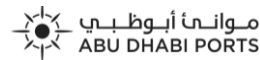
POWERBIM

MORE THAN 50 CLIENTS – BEST REFERENCES

PRIVATE CORPORATIONS



PUBLIC AND GOVERNMENT ENTITIES



CONSTRUCTION COMPANIES



TECH AND COMMERCIAL PARTNERS



PRICES AND RECOGNITIONS



2024 – FINALISTS INTERNATIONAL COMPETITION



2024 – BEST INTERNATIONAL STARTUP



2023 – PRICE IN IA HACKATHON IN PARIS



2021 – DUBAI EXPO BY SIEMENS PRICE FOR HACKATHON



2020 – DUBAI CITY RECOGNITION "FUTURE OF CONSTRUCTION TECH"



2020 – EU COMMISSION SEAL OF EXCELLENCE



2019 – FIRST PRICE FOR DIGITALIZATION AND NEW BUSINESS MODELS

THE (R)EVOLUTION OF POWERBIM DIGITALTWIN



COMPETITORS

They launched their platforms without a digital twin vision and are only now adding BIM visualisation and systems integrations.

Competing platforms are unable to provide data analytics or automated reporting.

POWERBIM

We began the platform with a digital twin vision, incorporating data analytics and automated reporting applied to BIM.

Today, we are adding predictive simulations.

The NEW VERSION of POWERBIM will include AI to maintain our technical advantage over competitors.



2024



1 DESCRIPTIVE

Identical representation of the asset connected. Information is displayed previously specified by the user.

* Reality Capture

* BIM Modelling

Virtual Model

Systems Integration

Real Time Data Viz

2 INFORMATIVE

Model is connected to sensors. Data is displayed from several points in the asset.

Data Insights

* Data Analytics

Interactive Reports

2024
POWERBIM

3 PREDICTIVE

The entity is now capable of predicting the outcome and problems of the systems based on the data collected.

* Simulations

Machine Learning

Predictive Maintenance

Advanced Analytics

* Value Engineering Services

2026
POWERBIM

4 COMPREHENSIVE

At this level, the entity can perform simulations and make recommendations based on the predictions.

Simulations vs Real Time

IA Decision Assist

Remote Controlled Inspections

Asset Optimization

2028
POWERBIM

5 AUTONOMOUS

The entity is capable of learning based on the data processed, and to perform actions based on decisions without human interaction.

Remote Operations (sensors & systems)

IA Assistive Maintenance

Remote Autonomous Inspections (Drones, etc)

Assistive Maintenance

Drone Assistive Maintenance

DIGITALTWIN MATURITY INFOGRAPHIC

The DigitalTwin Maturity Level
(Woolpert)

* Optional Services complementary to the platform solution provided.

Legend: ● POWERBIM Basic Features ● POWERBIM unique features ● Next Steps / Future Developments

REFERENCES IN DIGITALTWINS

POWERBIM

1. DigitalTwin for NYC
2. DigitalTwin for European Investment Bank Headquarters
3. DigitalTwin – Abu Dhabi Ports
4. DigitalTwin for Stellantis Car Manufacturing Plant
5. DigitalTwin for Government of Catalonia Headquarters
6. DigitalTwin for Madrid Nuevo Norte (Madrid City Expansion Project)
7. DigitalTwin for Waste Treatment Industrial Plants. TERSA (Barcelona)
8. Zalando SE Warehouses. DigitalTwins For Asset Maintenance
9. POWERBIM for electric modules. Schneider Electric
10. POWERBIM Implementation for AENA. Automated BIM Audit data quality reports
11. Remote Inspection for 2 Hospitals during construction works in covid period
12. Clinic DigitalTwin. Hospital Sant Pau
13. Healthcare IoT + BIM DigitalTwin. Hospital del Mar in Barcelona
14. DigitalTwin for Palacio Velazquez Museum (Museum Reina Sofia) in Madrid
15. Pilot project. Real Sociedad Soccer Stadium (Spain)
16. Pilot project. Zaragoza Smart City
17. Pilot project. Santander Digital Avenue



PARTNERSHIP FUND
for New York City



DigitalTwin for NYC

A UNIQUE OPPORTUNITY

POWERBIM

PARTNERSHIP FUND
for New York City

In December 2024,
POWERBIM will reach the
semifinals of an international
startup competition
(Buildings Tech Lab) to
present solutions for working
with Big Data in NYC
buildings in NYC.

The program includes the
opportunity to demonstrate a
pilot of the application to
representatives of the NYC
Department of Buildings and
the Partnership Fund.

After this demonstration,
there is an active channel to
explore collaboration
opportunities.



Buildings Tech Lab

Accelerating innovation in building construction, safety, and sustainability in New York City.

The Buildings Tech Lab is a collaboration between the NYC
Department of Buildings and the Partnership Fund for New York City.

IN PARTNERSHIP WITH

PARTNERSHIP FUND
for New York City

Dear Fernando,

Congratulations! POWERBIM SL has been selected as a semifinalist for the Buildings Tech Lab. With nearly one hundred candidates, it was a very competitive process to select semifinalists for the lab. We look forward to working with you.

As a next step, **we would like to invite you for an in-person pitch presentation on 11/7/2024 from 11:15 AM to 11:40 AM ET** and ask that you hold [11/8/24 from 9:00 AM – 12:00 PM ET](#) on your calendar for a product demonstration (Demo Day), should you be selected to attend.

Please review the [Semifinalist Prep materials](#) and be ready to submit your PowerPoint presentation no later than *Friday, November 1 at 12:00 PM ET*. To learn more and ask any questions about the format of the presentations please plant to attend a 30-minute semifinalist info session on **Thursday, October 17 at 11:30am ET**: <https://pfnyc.zoom.us/j/83835440302>.

Please confirm your attendance by Friday, October 18 at 12:00 PM ET by registering all presenters (full name, title, email, phone number) and any other team members that will be joining here:

<https://partnershipfornyc.typeform.com/BTLPitchConfirm>

We look forward to hearing back from you!

Best,
Buildings Tech Lab Team

<https://buildingstechlab.nyc/>

A DIGITALTWIN FOR DATA ANALYTICS FOR DOB

Integration:

POWERBIM integrates GIS/BIM models, NYC DOB (New York City Department of Buildings) data related to building permits and other issues, IoT data, and remote inspection results to optimize data use and automate operations.

Key Features:

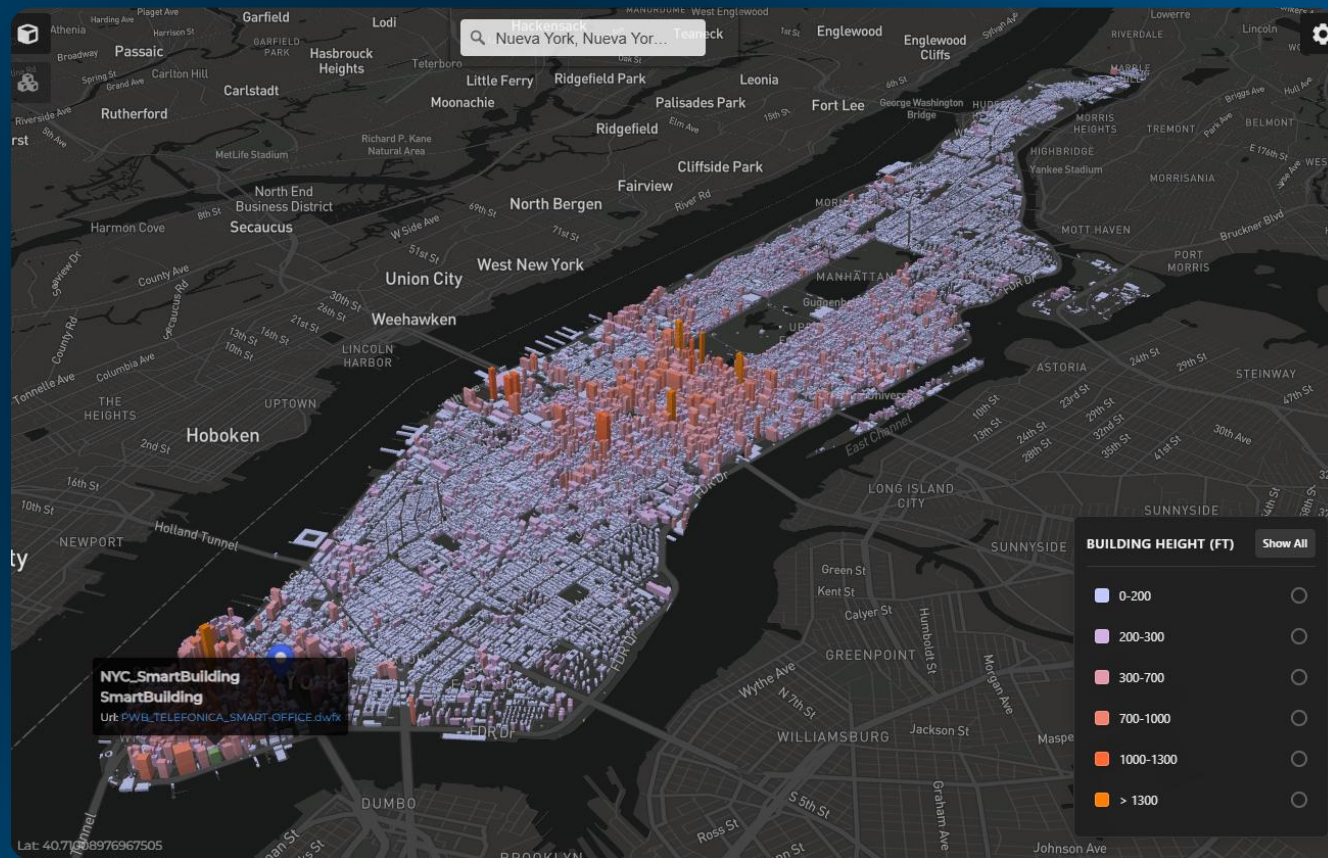
Automated Data Validation: Ensures the accuracy of building information for compliance reporting, flagging inconsistencies in real time (useful for emissions or compliance with the LL97 CO2 emissions reduction regulation, among others).

Predictive Analytics and Alerts:

Helps the DOB identify high-risk applications, track changes, and generate alerts near vulnerable structures.

Benefit for the NYC DOB:

Reduces time spent on manual data entry and verification, improves accuracy, and allows staff to focus on priority tasks through automated systems.





DigitalTwin for European Investment Bank Headquarters

CORPORATIVE DIGITALTWIN

Integration:

The BIM model for the EIB headquarters in Luxembourg has been integrated, as the start of a long-term commitment to gradually integrate multiple systems and provide a cloud-based digital twin infrastructure to manage this and the rest of the entity's assets.

Key Features:

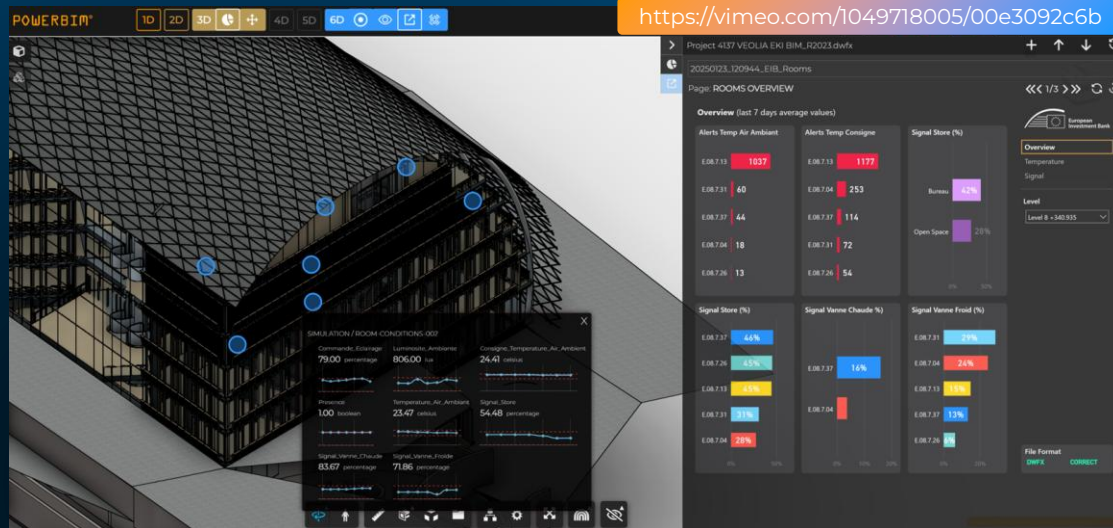
In this first implementation, HVAC systems have been integrated for indoor comfort management, as well as alarm integration for the Iconics Genesis64 BEMS system and the Archibus CMMS.

Dashboards and Real-Time Data

Custom dashboards have been generated that will serve as a template for scaling KPIs to other areas of the building and automating large-scale analytics.

Benefit for the EIB:

Having its own cloud infrastructure with data science ready for scale, as well as an intuitive client application for asset management.





DigitalTwin – Abu Dhabi Ports

DIGITALTWIN FOR PORTS

Integration:

We integrated VTS with GIS, a maritime traffic control and management system in port areas in POWERBIM, which allowed for the design of shipping routes.

We also worked on integrating a cloud infrastructure (DataLake) with POWERBIM in a port building to manage real-time and historical data, as well as compare it with simulations.

Key Features:

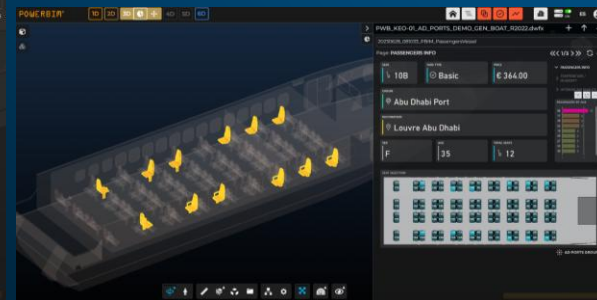
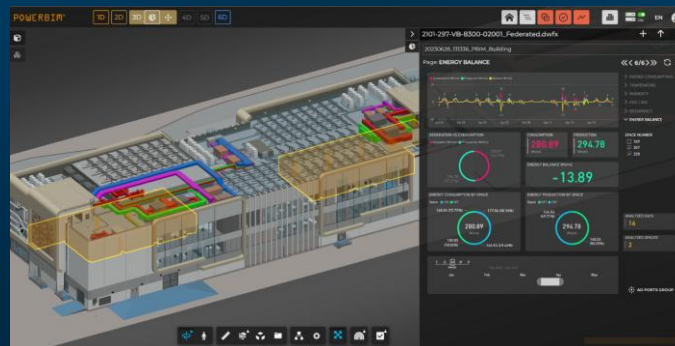
At the port level, we were able to view shipping company data, occupancy, routes, and even tidal data integrated with GIS. At the building level, we visualized data managed by the BMS and compared it with ideal simulations to manage the differences between ideal and real-time data.

Dashboards and Real-Time Data

Custom dashboards, alarms, and simulations were generated.

Benefit for AD Ports:

Together with our partner, KEO, this project has laid the foundation for a much more comprehensive development.



<https://vimeo.com/840903347/457f77c117>



4

DigitalTwin for Stellantis Car Manufacturing Plant

PHOTOVOLTAICS DIGITALTWIN

Integration:

Predictive algorithms developed by the UPC (Polytechnic University of Catalonia) have been integrated. Connecting to the weather forecasting service and using the properties of the inverters and strings of the largest rooftop photovoltaic plant in Spain, they have created a POWERBIM-integrated simulator capable of predicting the electrical power generated for the Stellantis vehicle manufacturing plant in Vigo a week in advance. It can also detect past deviations in actual production compared to the simulation, making it possible to identify faults in the thousands of panels and hundreds of strings installed very early.

Key Features:

Integration with the HUAWEI SCADA system

Simulated and real data

Custom graphs have been generated to compare real data with simulated data, obtaining average and maximum deviations calculated over the selected time interval, as well as other developments so that it can be managed at the building, area, inverter, and string levels, on demand.





Generalitat
de Catalunya

infraestructures.cat



5

DigitalTwin for Government of Catalonia Headquarters

SMART OFFICES

Integration:

The BIM model of the Generalitat's administrative district headquarters has been integrated into multiple systems: Tririga Space Manager (IBM), CMMS (Mantest), and BMS Desigo (Siemens), in addition to the installation of sensors in several rooms (real-time occupancy, interior comfort, energy consumption).

Key Features:

The POWERBIM platform's ability to manage multiple facility management systems linked to the building's spaces, equipment, and facilities has been demonstrated.

Dashboards and Real-Time Data

Customized dashboards have been generated, including area reservations, integrated 2D maps, etc.

Benefit for Infrastructure:

Experience and experience firsthand the use of a digital twin to improve asset management efficiency with the advantages of BIM and systems integration.





6

DigitalTwin for Madrid Nuevo Norte (Madrid City Expansion Project)

SMART CITY DIGITALTWIN

Integration:

The existing "model 0" of the project area, corresponding to the 3 million m² expansion of the city of Madrid, has been integrated. It has been integrated into the CDE – Autodesk Construction Cloud, generating interactive dashboards for multiple projects with the digital urban model in GIS and BIM. This allows you to navigate from the large scale to the detailed scale of the building without leaving the same interface.

Key Features:

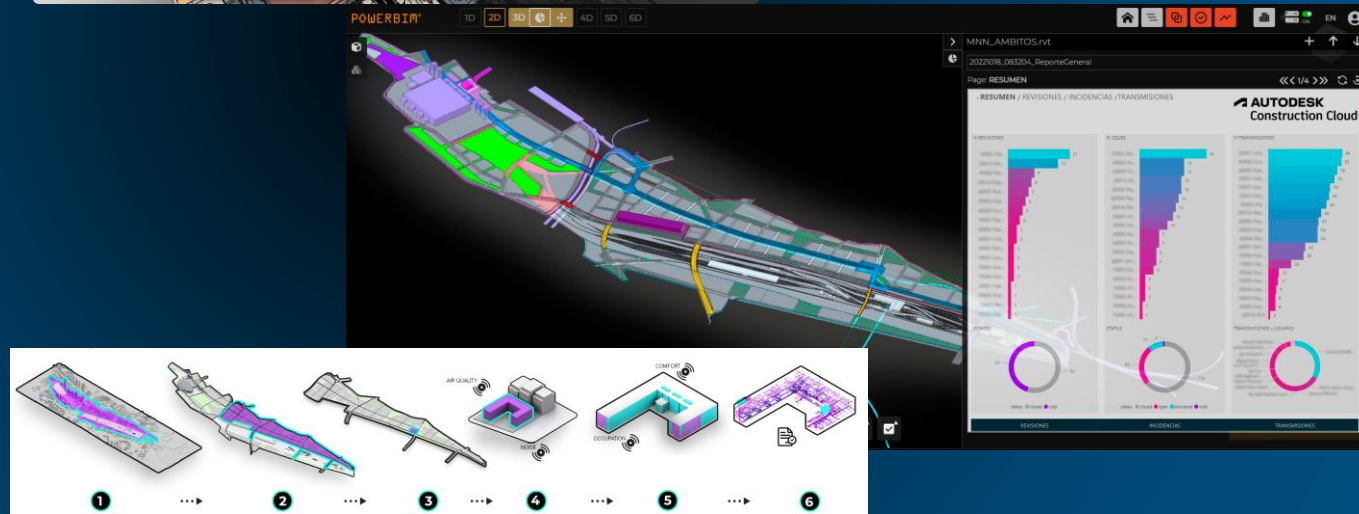
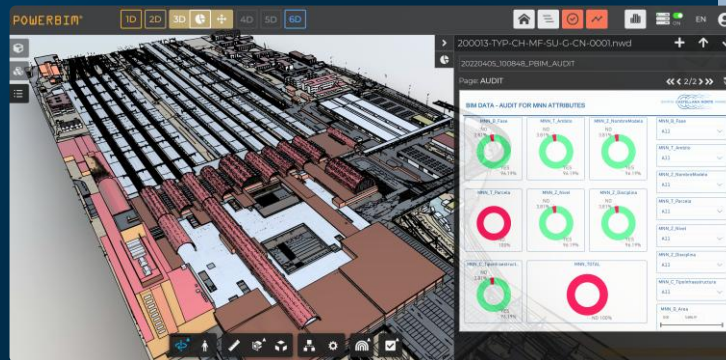
Automated quality control and EIR compliance audit of contractor models. Integration with Madrid OpenData. Progress monitoring of projects in the design and construction phases.

Dashboards

Custom dashboards have been generated that will serve as a template for the multiple projects they manage.

Benefit for the North District:

Having a multi-scale digital twin, GIS, and operational BIM, allowing for monitoring project progress.





7

DigitalTwin for Waste Treatment Industrial Plants. Tersa (Barcelona)

BIM INTEGRATION TO CMMS

Integration:

POWERBIM has been integrated with the Linx Sphere CMMS to display work orders, stock, inventory, and the technical information associated with these inventories on dashboards. By having the same coding in the BIM model as in the CMMS inventory, the integration is automated, and data analytics can be obtained that combine BIM data with CMMS data.

Key Features:

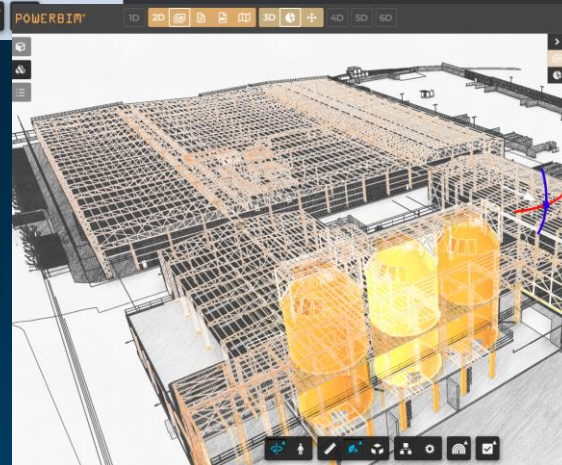
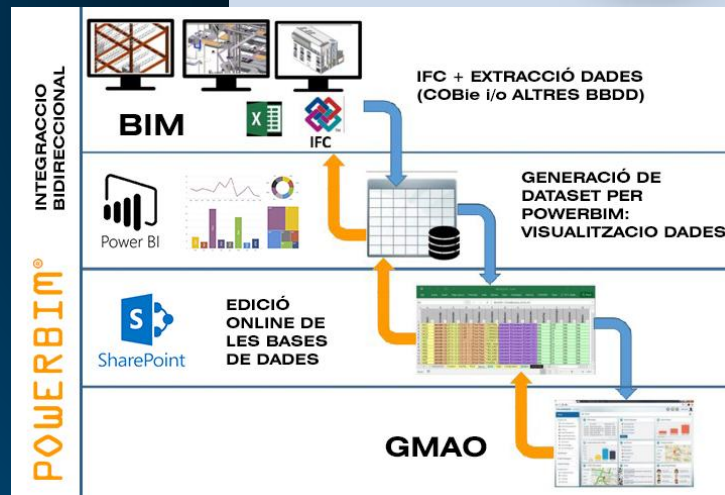
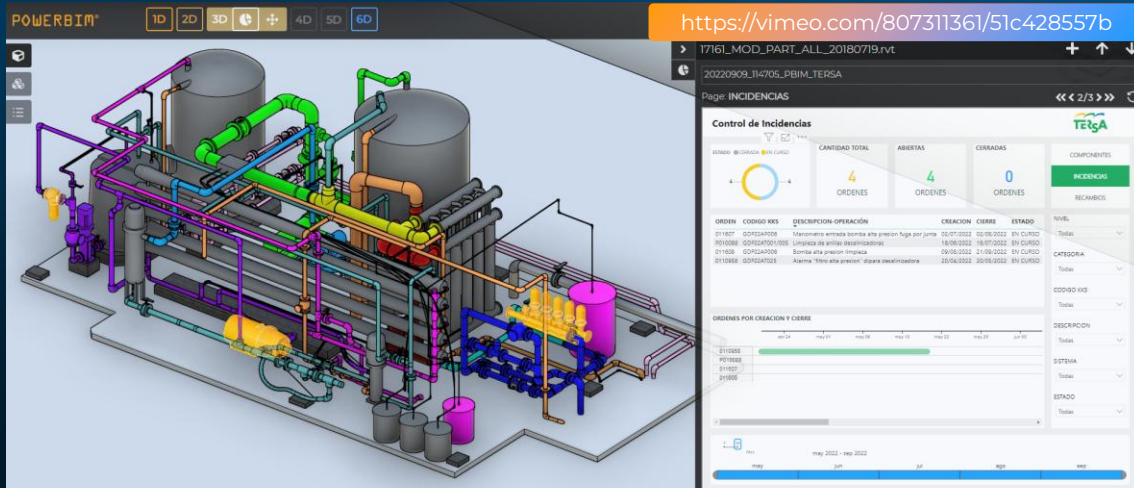
A two-way integration has been implemented for work orders and incidents, so that if an incident is created in the CMMS, it will become part of POWERBIM and, in turn, will be synchronized with the Autodesk Construction Cloud, creating an automated flow between the three systems.

Dashboards

Custom dashboards have been generated that will serve as a template for the multiple projects they manage.

Benefit for the North District:

This integration has enabled coordinated work between the BIM and maintenance departments to manage assets.



A large white circle containing the number 8, centered on the left side of the slide.

8

Zalando SE Warehouses. DigitalTwins For Asset Maintenance

DT FOR ASSET MANAGEMENT

Integration:

We have been a subscriber to the POWERBIM platform with Zalando for five years and have implemented all types of integrations with its logistics centers. These include CMMS/CAFM, BMS, EMS, Space Management, and also the integration of people flow simulations integrated into POWERBIM.

Key Features:

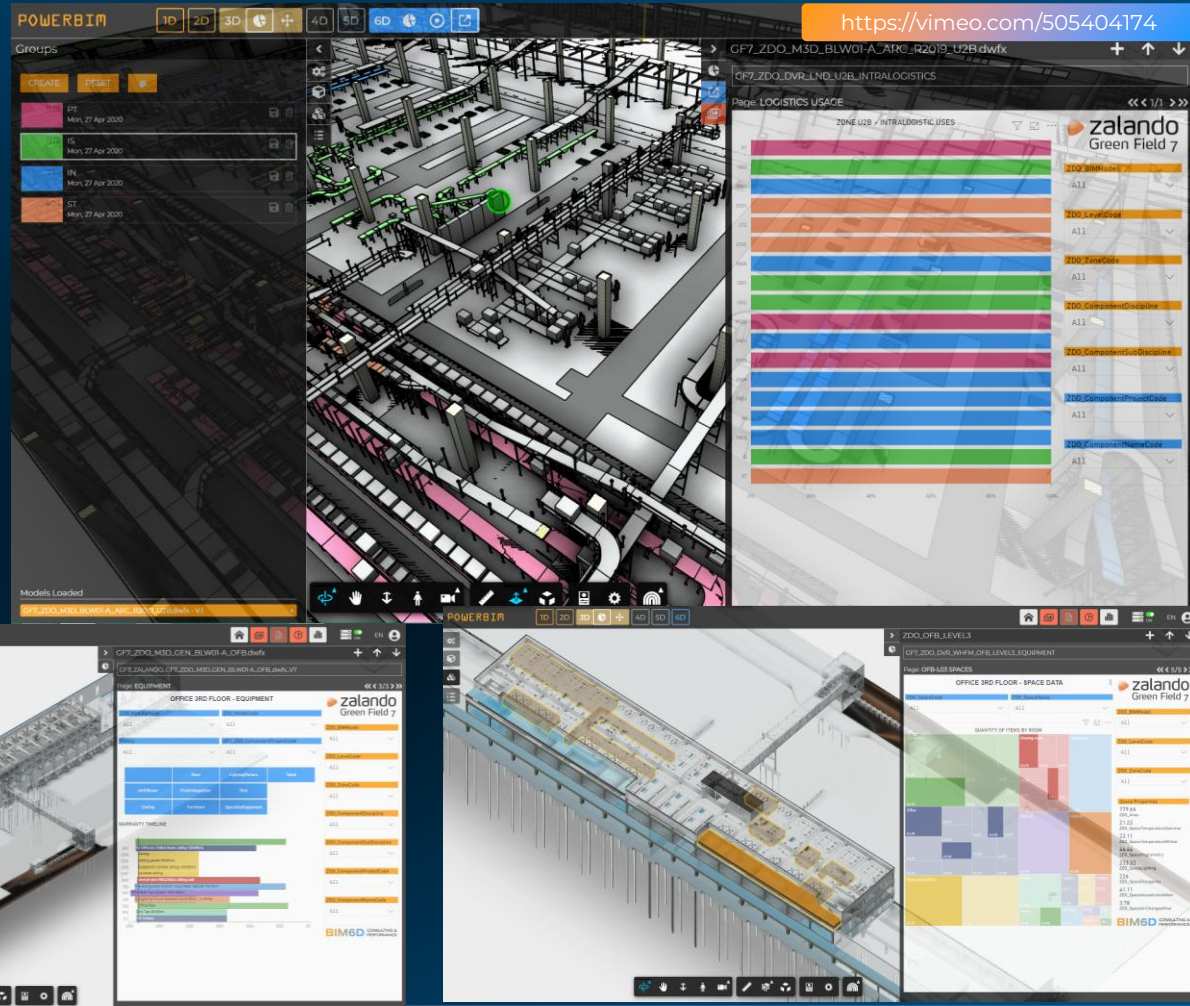
The initial objective was to manage construction processes by integrating BIM model review workflows, clash detection, and incidents. It gradually transformed into a key manager for Facility Management through access to system data from BIM models.

Dashboards

All types of customized dashboards have been generated to serve as a template for multiple use cases.

Benefit for Zalando:

Now that Zalando Warehouses is working with BIM, the digital twin is key to incorporating management data into models that the CDE doesn't have, and many, until now, didn't have access to this key information.





POWERBIM for electric modules. Schneider Electric

UPS DATACENTER DIGITALTWIN

Integration:

We created a digital twin of a modular Battery Rack system for a Data Center (confidential). Thanks to the integration with EcoStruxure BAS/BMS, we can manage all the information from this powerful system from the BIM model.

Key Features:

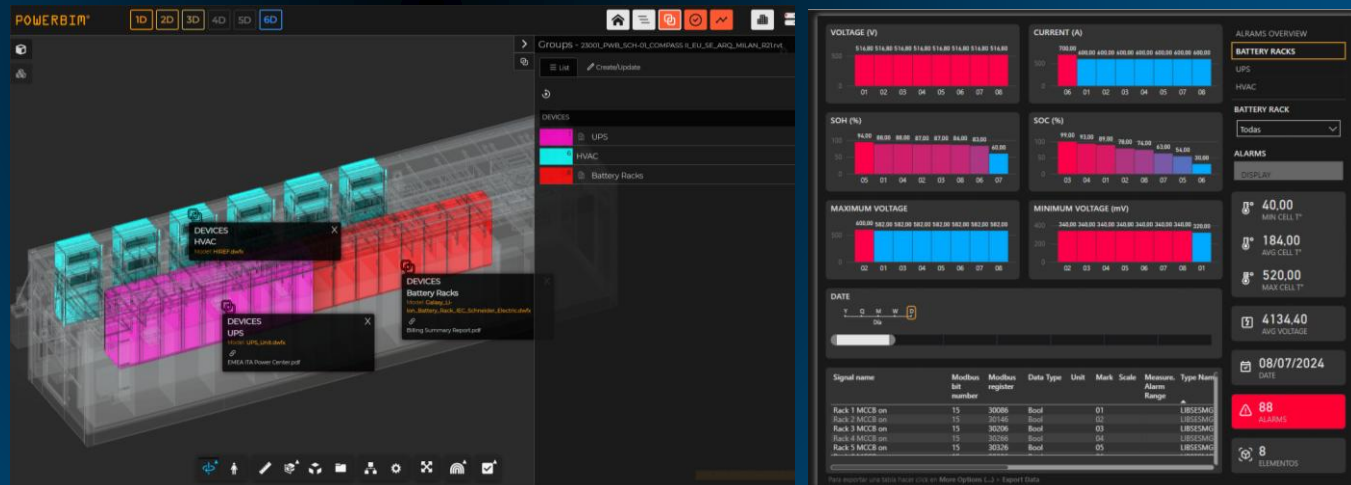
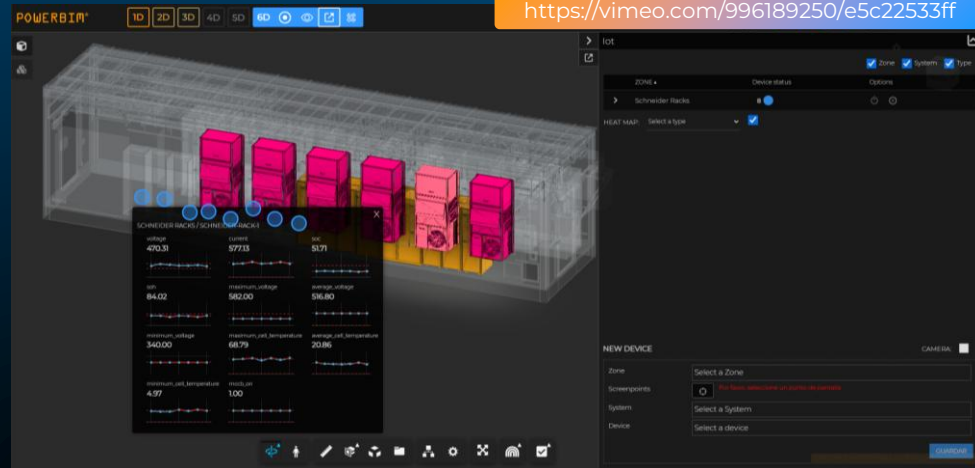
The goal was to connect the assets in the BIM model with their equivalent assets in the EcoStruxure system, managed differently, by implementing a middleware layer that creates relationships between the different classification systems.

Dashboards

All types of customized dashboards were generated with key data from the system.

Benefit for Schneider:

Schneider has been working with BIM for years, and for the first time, they were able to connect the models to their energy management system, which will help foster key interdepartmental collaboration for the company.





POWERBIM Implementation for AENA. Automated BIM Audit data quality reports

AUTOMATED BIM AUDIT

Integration:

The project, awarded through a competitive bidding process under a contract with Telefónica, allowed Aena to implement the POWERBIM solution to automate the BIM audit processes of its airports' digital models to verify compliance with BIM protocols.

Key Features:

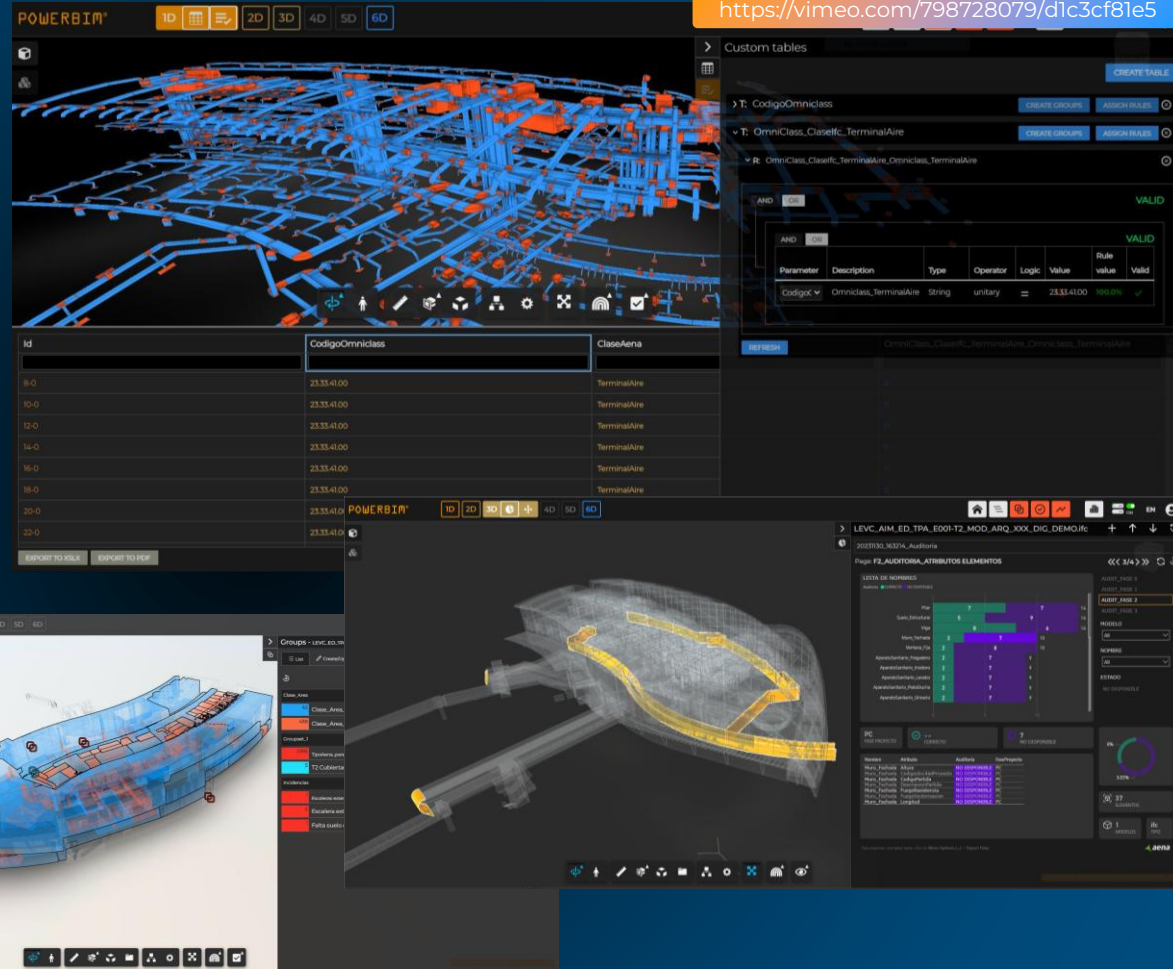
Among other automations, the audit of thousands of components of any model has been integrated against an audit matrix. This matrix is hosted in an Excel spreadsheet with thousands of cells containing required values, so that each attribute of each model component is checked against the values in each cell.

Dashboards

All types of customized dashboards have been generated for all types of audit processes. Functionalities have also been implemented to create rules directly from the application.

Benefit for Aena:

Thousands of hours of work have been saved and human errors in BIM audits have been avoided.



/Salut



11

**Remote Inspection for 2 Hospitals during
construction works in covid period**

REMOTE INSPECTION

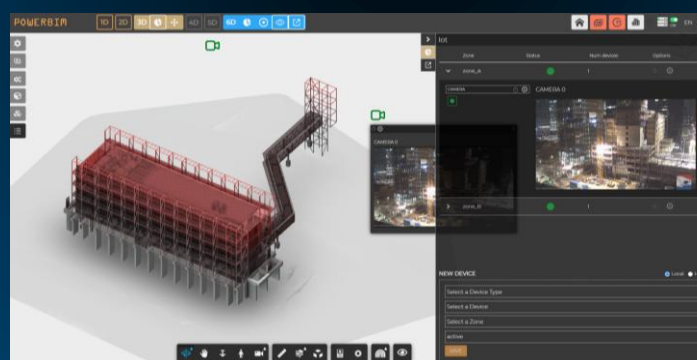
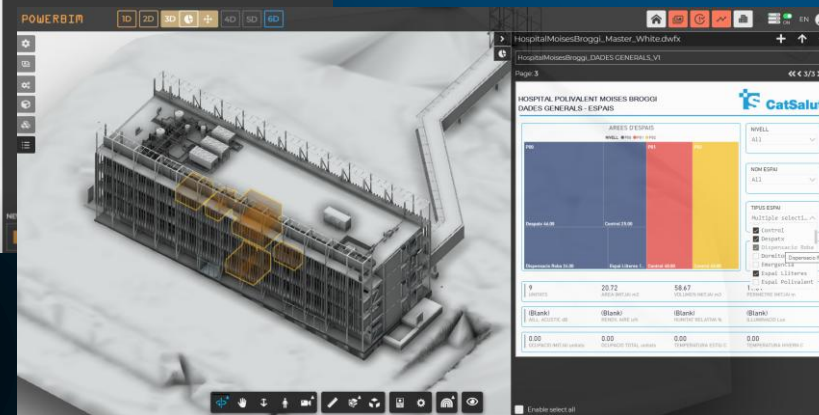
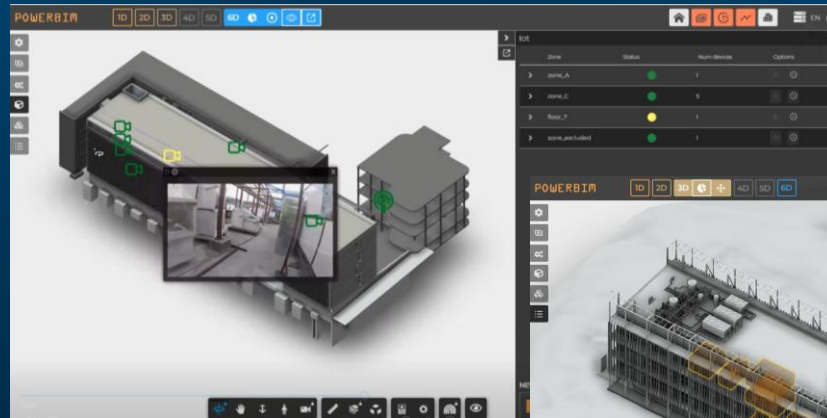
Integration:

Due to COVID-19, five new emergency satellite hospitals were built in Catalonia. For two of them, the Moises Broggi i Germans Tries i Pujol Hospital in Barcelona, the Department of Health contacted us to implement a solution that would allow technical visits to the construction sites without having to be present during the lockdown period.

Using fixed and mobile cameras with geolocation and streaming, we integrated operator routes and their videos into the digital twin to conduct remote technical visits between the different professionals and CatSalut. The project allowed for visual inspections not only live, but also through recordings of incidents reported on the model. Since the routes were localized, it was possible to precisely locate the locations and components assigned to them.

Benefits for CatSalut:

Based on this experience, this remote inspection technology connected to BIM is a requirement in all hospital construction tenders in Catalonia.





Generalitat
de Catalunya



SANT PAU
Campus Salut
Barcelona



Hospital de
la Santa Creu i
Sant Pau

12

Clinic DigitalTwin. Hospital Sant Pau

CLINIC DIGITALTWIN SIMULATIONS

Integration:

Work has been done on integrating predictive machine learning algorithms developed by the UPC (Polytechnic University of Catalonia) into the digital twin to develop patient and clinical staff occupancy scenarios based on multiple historical data sources (internal systems, interventional machines, scheduling).

Key Features:

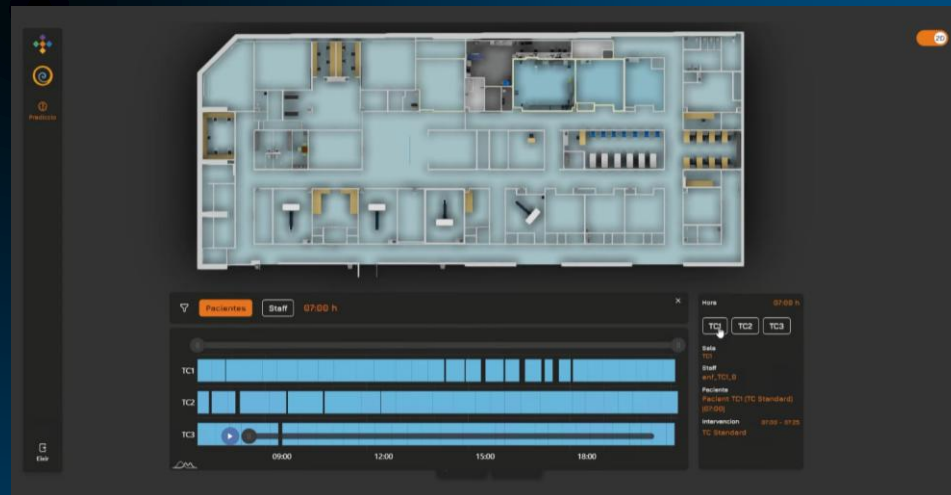
The digital twin not only allows simulations to be launched based on an established schedule, to determine occupancy times and staff and equipment allocation, but also to incorporate emergency situations that disrupt schedules and allow for real-time decisions on intervention planning based on emergencies that occur.

Benefit for Sant Pau Hospital:

This digital twin will undoubtedly lay the groundwork for a much more ambitious and even more useful development, given the success and satisfaction of the results reported by the medical staff.



<https://vimeo.com/1057896747/45375d39f8>



PINEARQ

Hospital del Mar
Barcelona

13

DigitalTwin for Palacio Velazquez Museum (Museum Reina Sofia) in Madrid

HEALTHCARE BIM+IoT DIGITALTWIN

Integration:

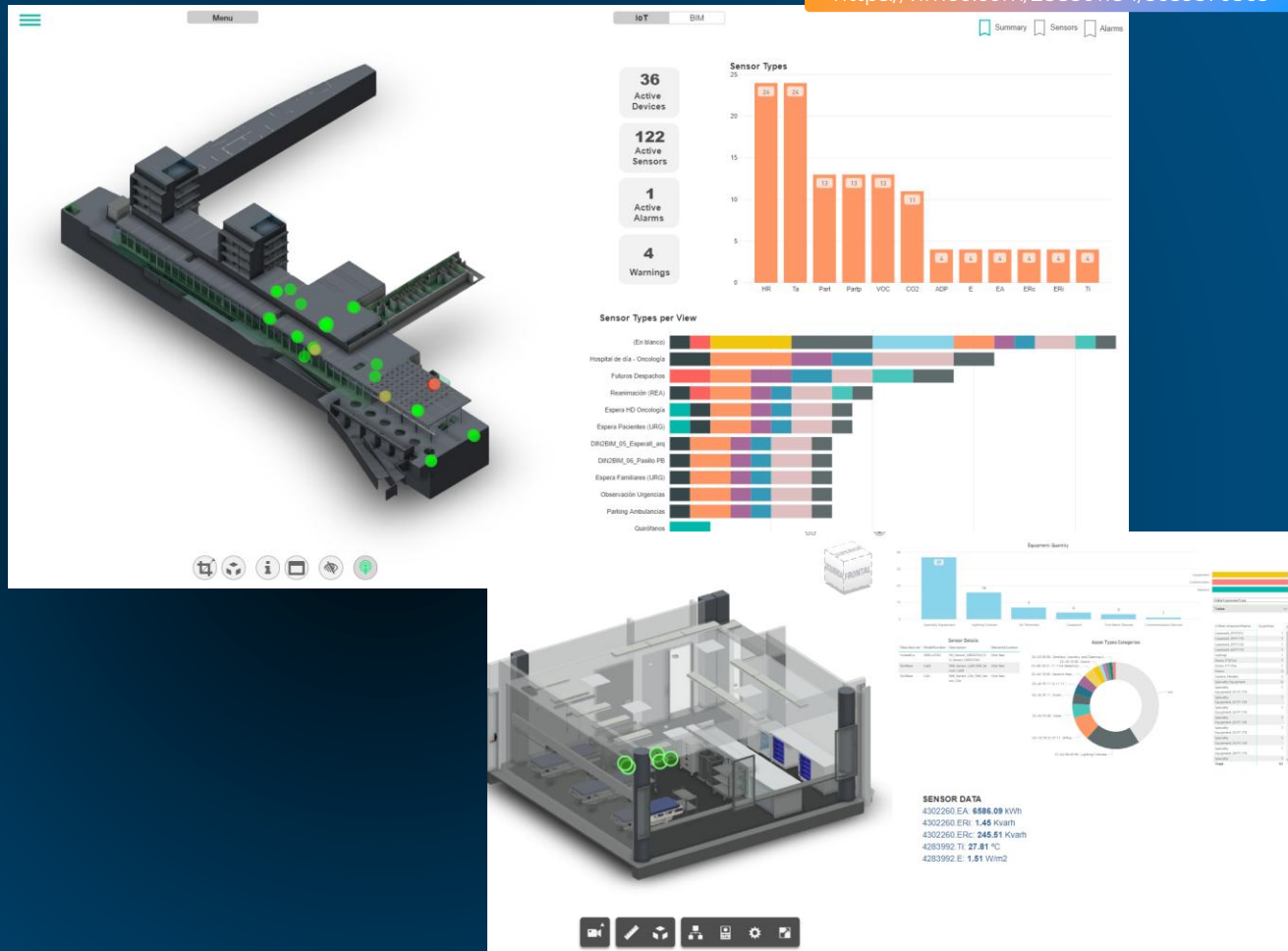
Work has been done to integrate multiple sensors located in clinical spaces (temperature, humidity, air quality, energy, pathogens, etc.).

Key Features:

The twin allows for the generation of alarms that issue notifications when values go out of range, as well as the creation of automated dashboards based on BIM maintenance data and monitored systems.

Benefit for the Hospital:

This project has laid the groundwork for the development of a comprehensive digital twin that Hospital del Mar is working on in a more scalable and ambitious manner.





Museo Palacio Velazquez de Madrid

MUSEUM DIGITALTWIN

Integration:

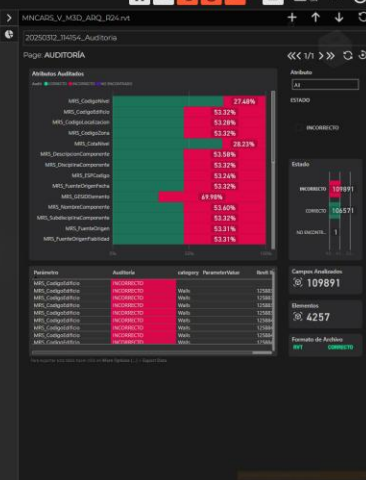
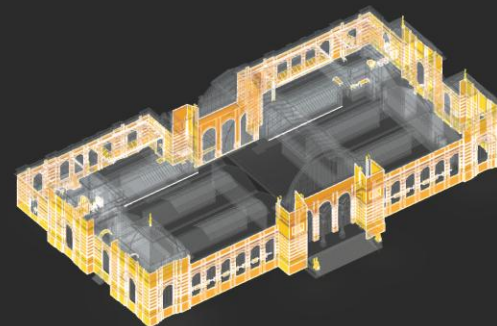
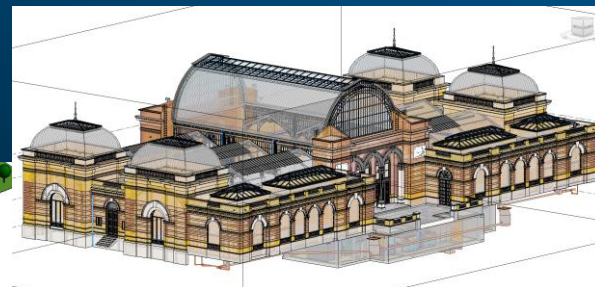
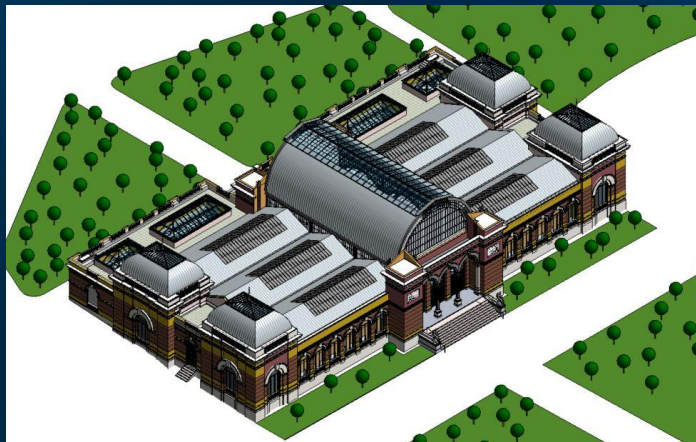
Our company has been awarded two contracts to work with the Museo Reina Sofia in Madrid. First, we are responsible for the BIM modeling of all the Museum's buildings, and second, we are tasked with generating a predictive digital twin to improve energy efficiency and other multiple indicators related to system maintenance and use.

Key Features:

POWERBIM is being integrated into the Siemens Design BMS. The EnergyPlus engine is also being integrated to launch calibrated energy simulations based on the BIM model, in addition to performing automated comparative analytics between real-time and simulated data for decision-making.

Benefit for the Museum:

The digital twin of the Palacio Velázquez is intended as a starting point for scaling this solution to the Museum's other locations, including the Sabatini Building, the Nouvel Building, and the Palacio de Cristal.





15

Pilot project. Real Sociedad Soccer Stadium (Spain)

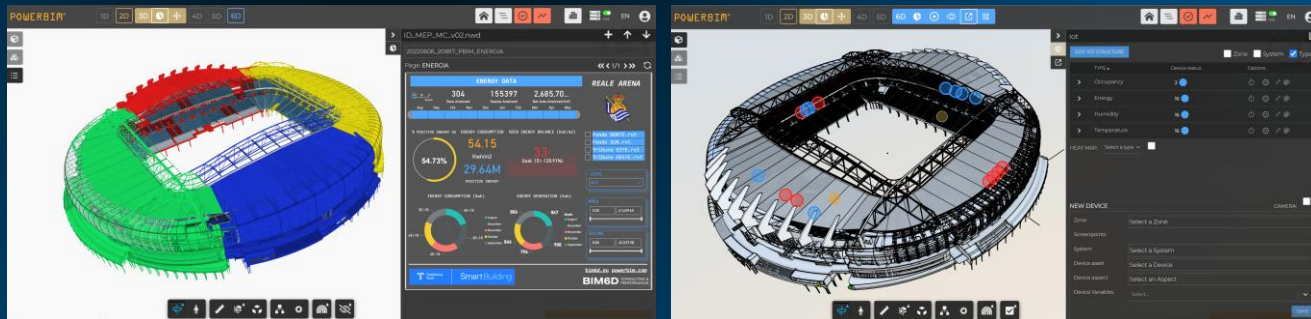
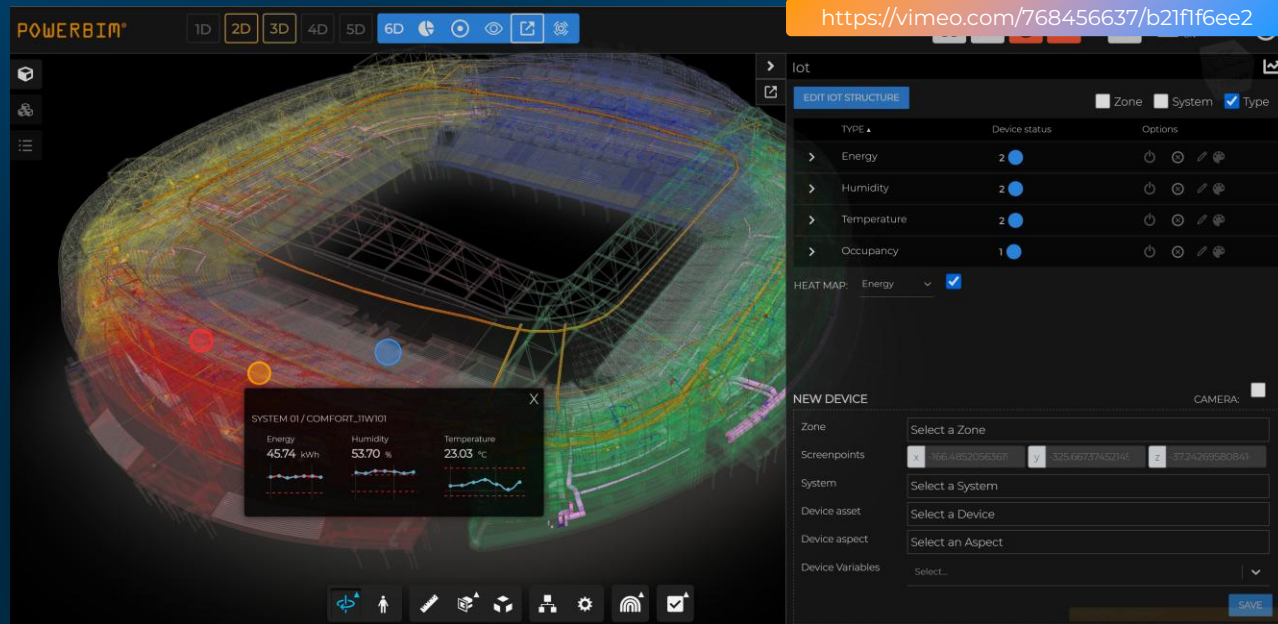
REALE ARENA STADIUM

Integration:

This project was proposed by Telefónica as an opportunity to secure the contract for the digital twin of the new Reale Arena football stadium.

This project was presented to the client, integrating simulated data for the pilot project, representing multiple energy management systems, occupancy comfort, etc., as well as integrating existing BIM data into POWERBIM.

We received very positive validation and impact from the end client, which is pending award.





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Pilot project. Zaragoza Smart City App

ZARAGOZA SMART CITY PILOT PROJECT

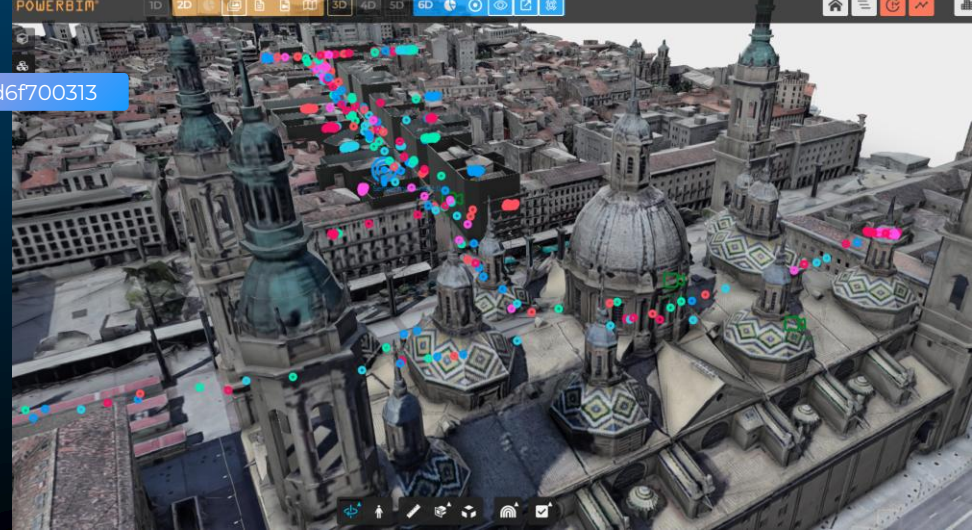
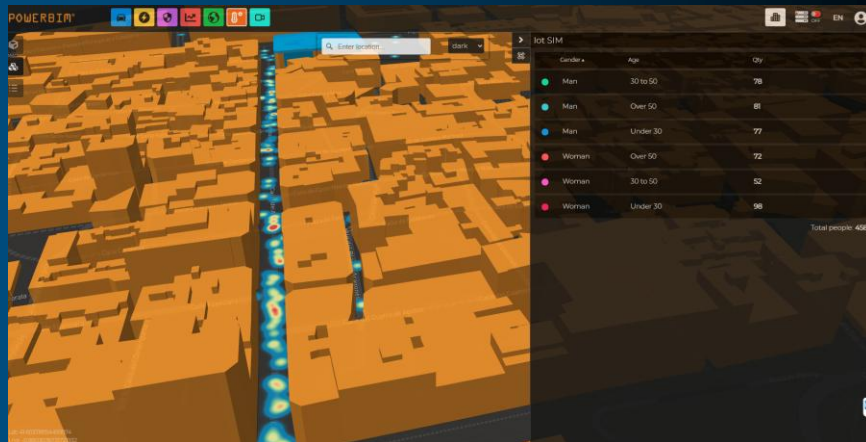
Integration:

This project was proposed by Telefónica as an opportunity to secure the contract for the digital twin of the SMART CITY FOR ZARAGOZA.

This project was presented to the client, integrating simulated data for the pilot project, representing multiple energy management systems.

VIDEO

<https://vimeo.com/555328425/ad6f700313>





Pilot project. Santander Digital Avenue

SANTANDER DIGITAL AVENUE

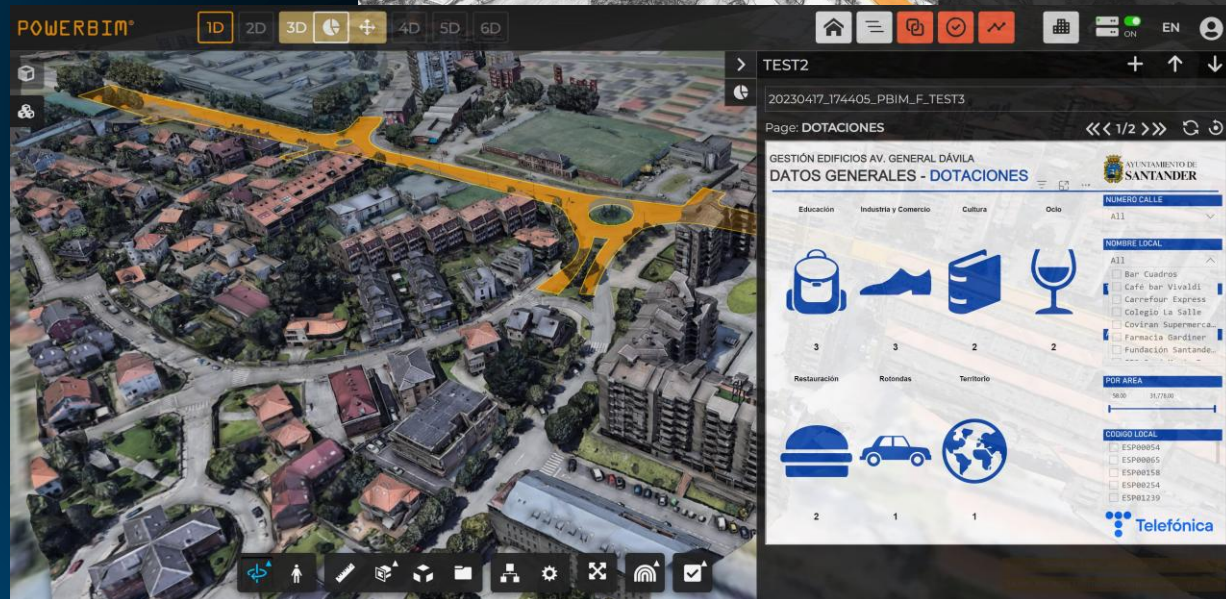
Integration:

This project was proposed by Telefónica as an opportunity to secure the contract for the digital twin of the DIGITAL AVENUE FOR SANTANDER.

This project was presented to the client, integrating simulated data for the pilot project, representing multiple energy management systems.

VIDEO

<https://vimeo.com/849908300/7c473e883d>





POWERBIM

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THANKS !!