From Ontology to Smart Building Insights

CitA Presentation 12th November 2024

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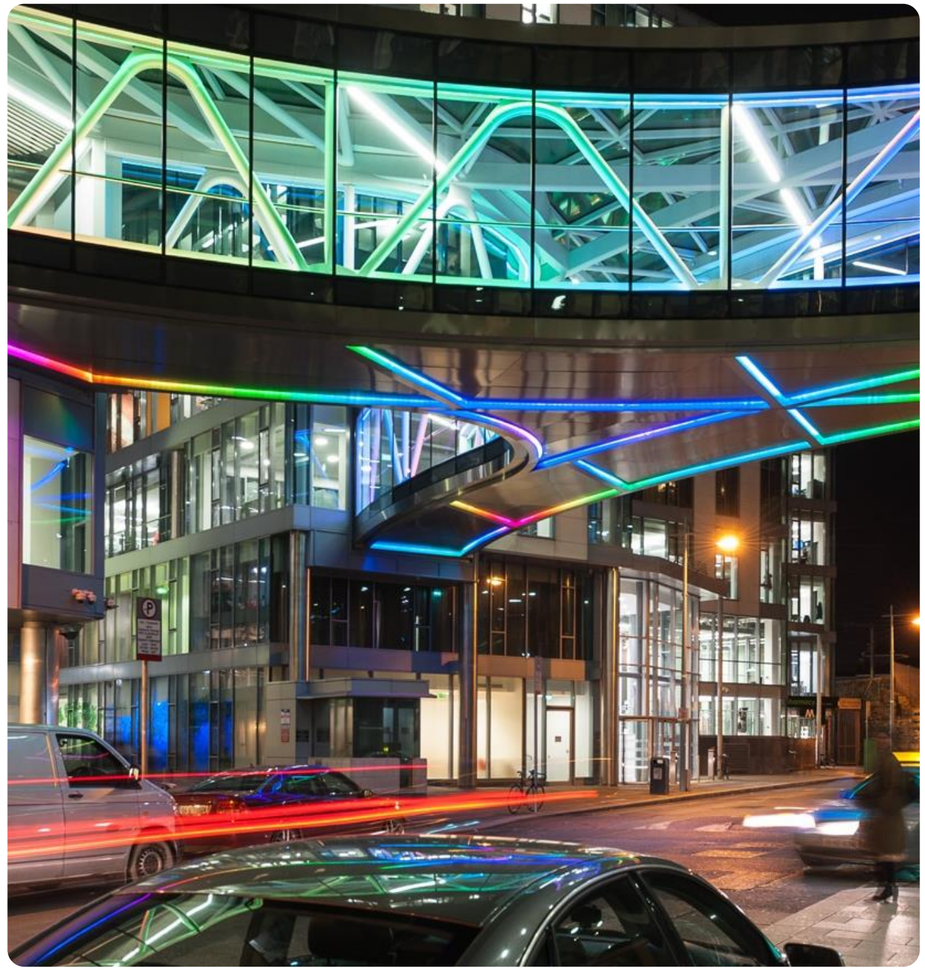
The Human Centric Approach to Smart Buildings

MSI

Master Systems Integrator

Smart Building Contractor

1. Must Be Agnostic
2. Do Not lead with Software or Apps
3. Top Level Responsibility for the Data
4. Contracted to Client
5. Focus on the Human



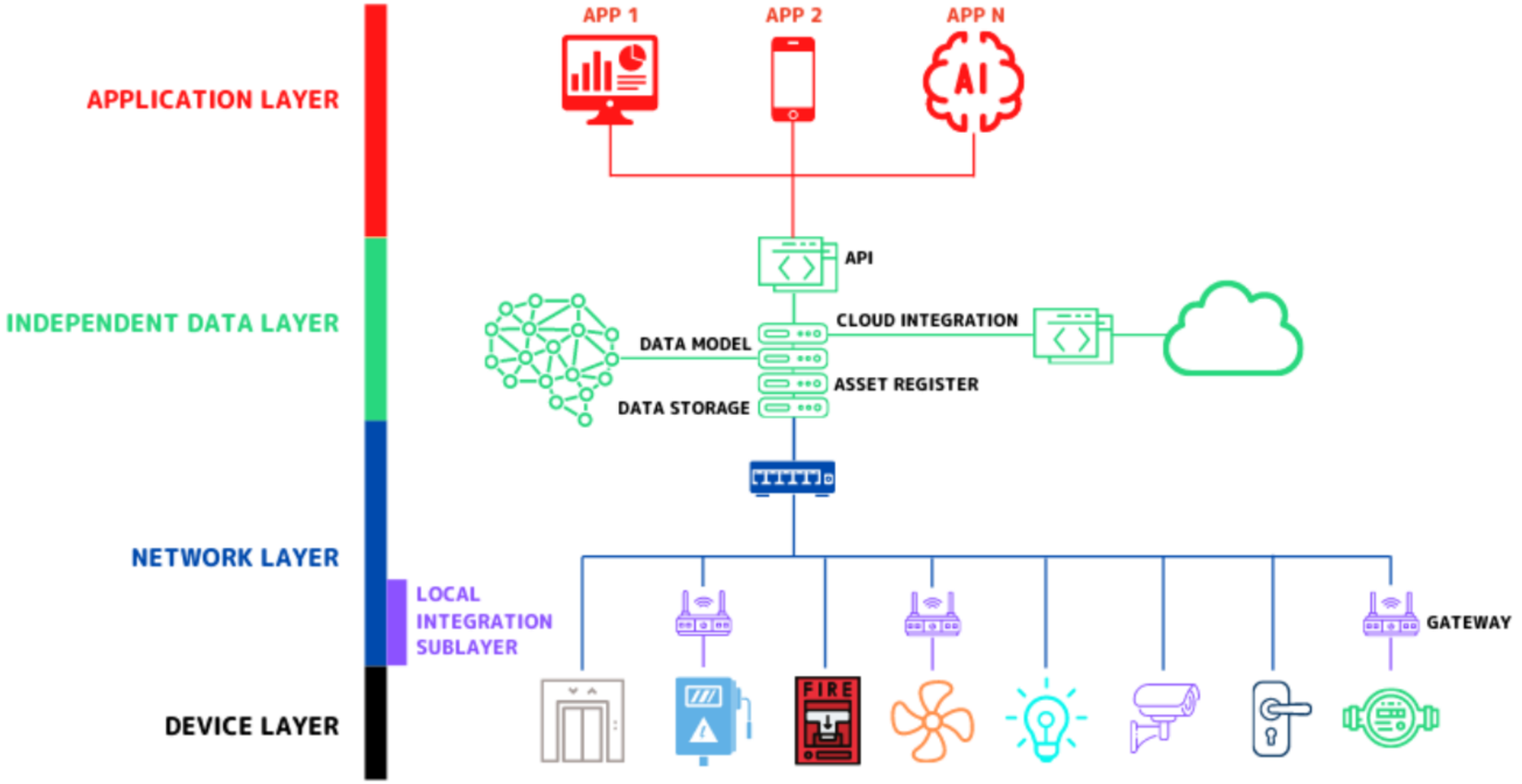
To ensure **all systems within a building communicate flawlessly with one another, that their data is made accessible & usable for a building’s optimisation and the wellbeing of its occupants.**

Full Stack Smart Buildings

- Managed services
- Software / SPOG
- Sensors & IOT
- Data Layer & Ontology

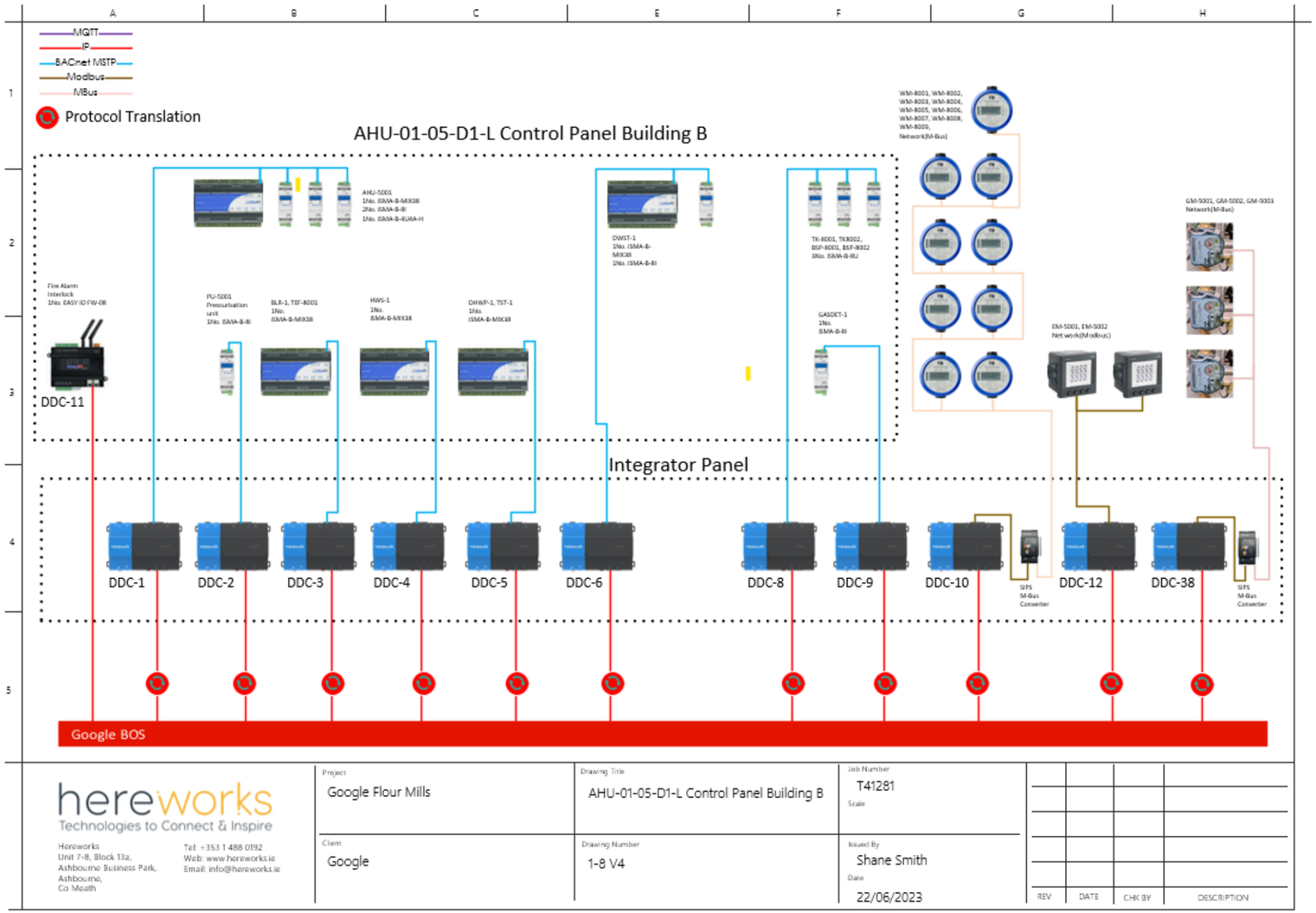
Data Layer & Ontology

Horizontal Architecture



Data Layer & Ontology

System Topologies



Sensors & IOT

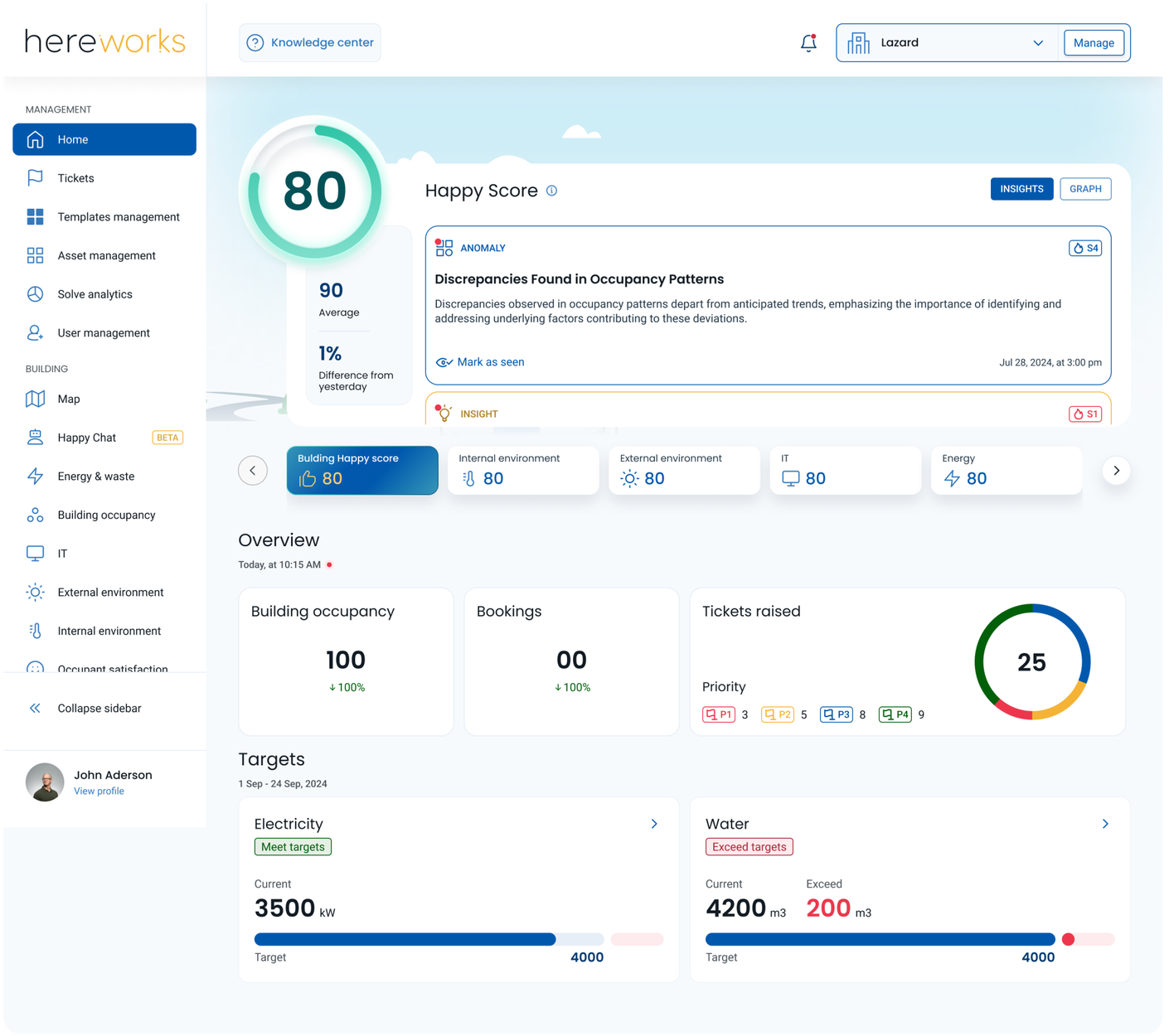
MQTT

ASHRAE BACnet™

Modbus

Software / SPOG

Single Pane of Glass

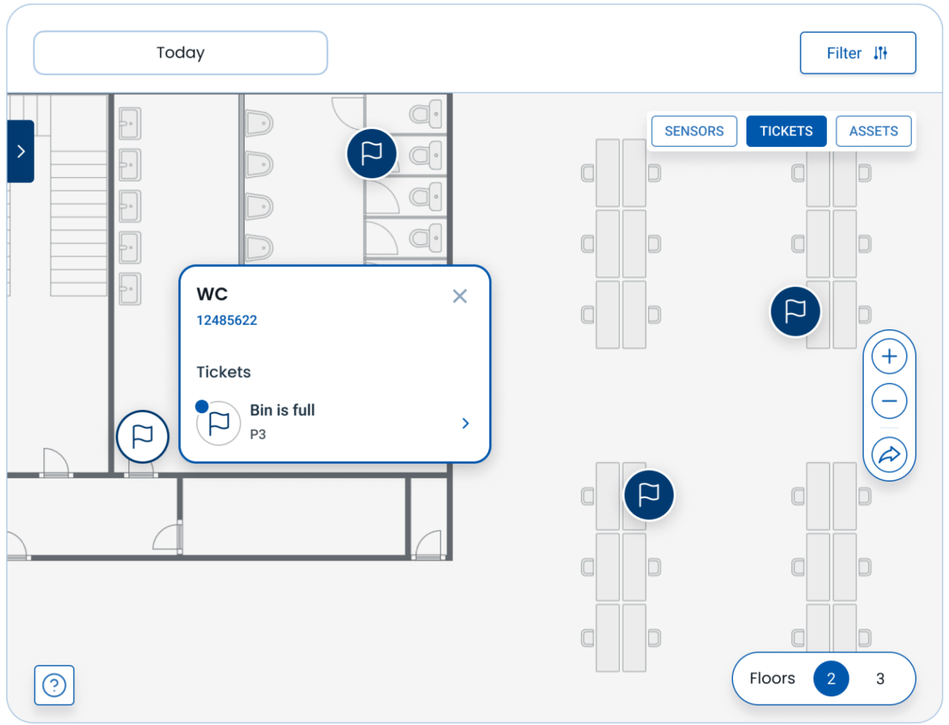


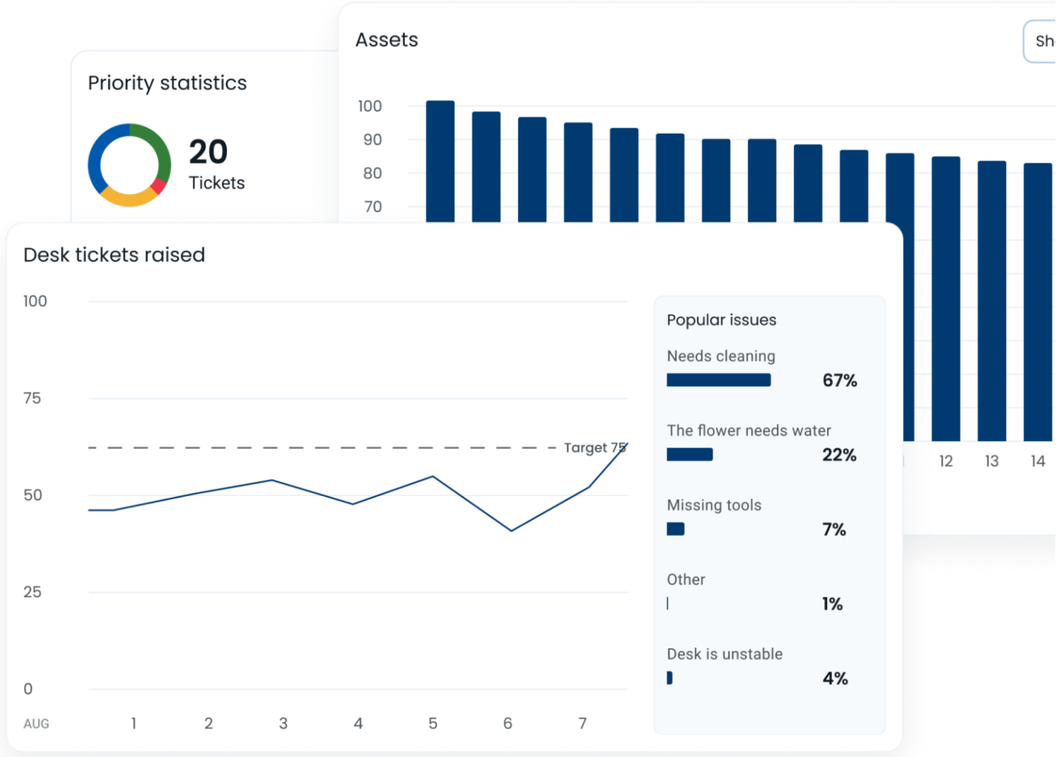
Managed services

Managed Services, Support & SLA

Real Insights

Combining Human Feedback with Building Data





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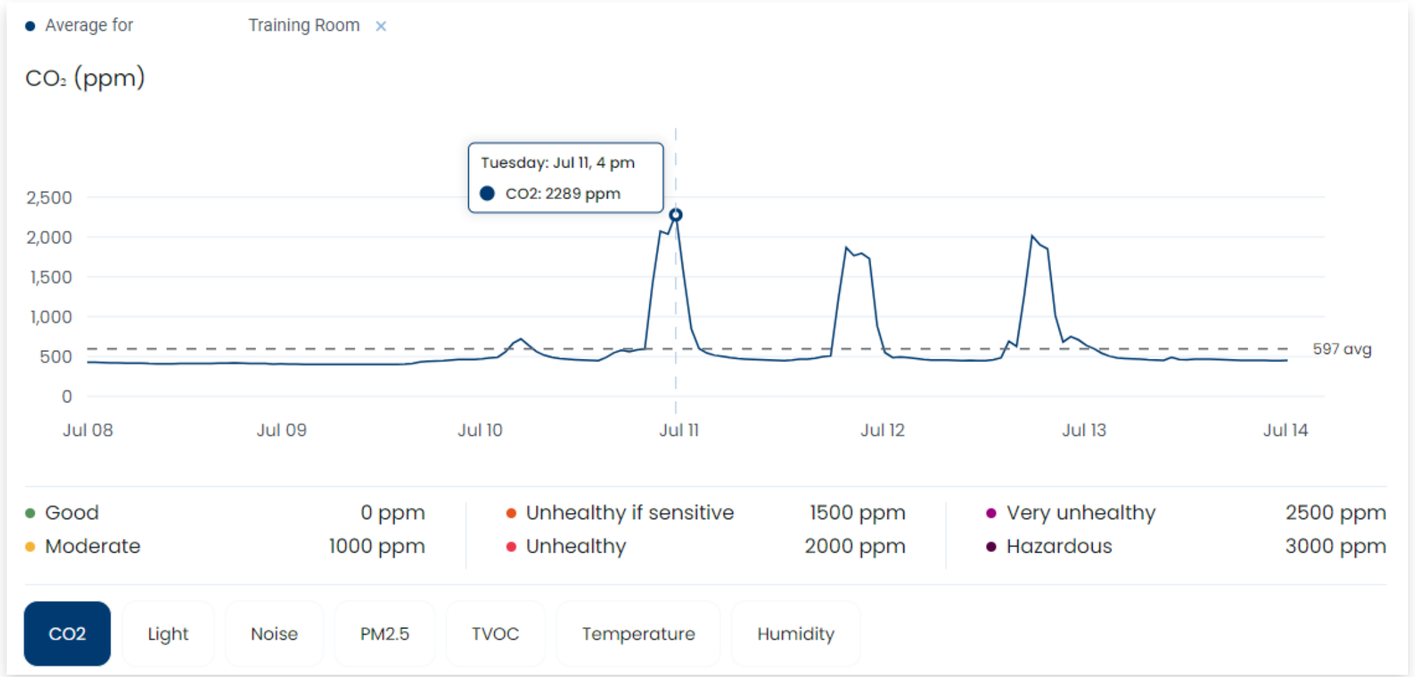
solve

IMPAIRED COGNITIVE ABILITY



INSIGHT

S1

CO2 Levels

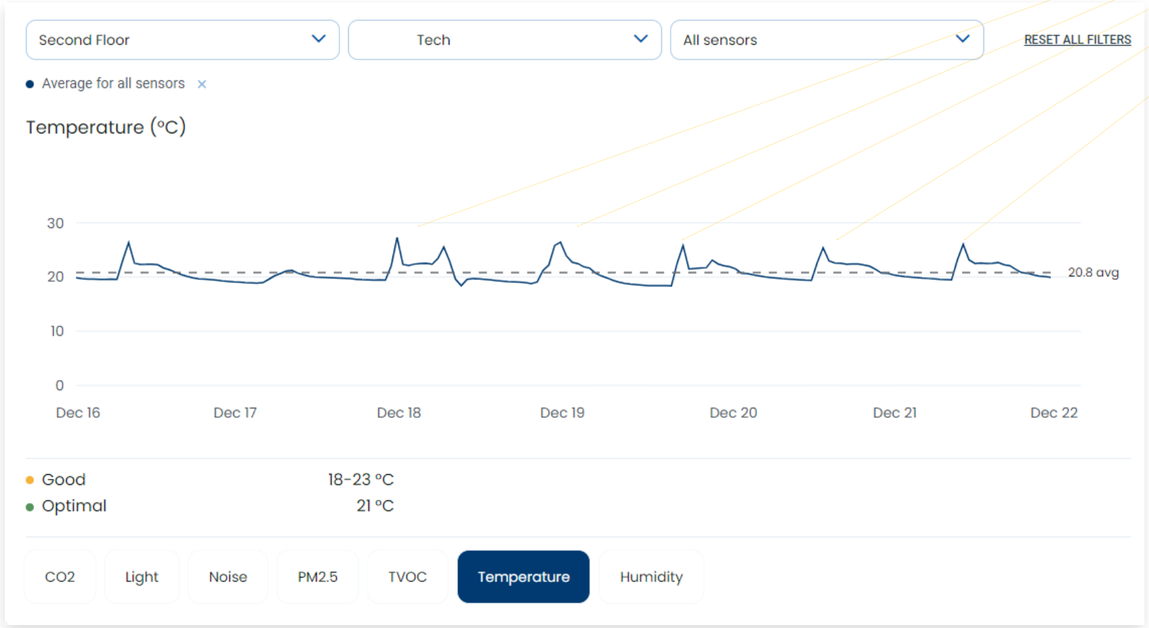
Major CO2 peaks were observed in Training Room which lasted extended periods on 11/07/2023.

This is the second successive day this phenomenon has occurred in this room.

Mark as unseen

ENERGY SAVING OPPORTUNITY

Temperature Curve in Rooms



INSIGHT

S1

Energy Wasted

Recurring Swings in Temperature in Room
It would appear that the HVAC system is set to overheat the Rooms, then users come in and reduce the temperature manually.

Mark as unseen

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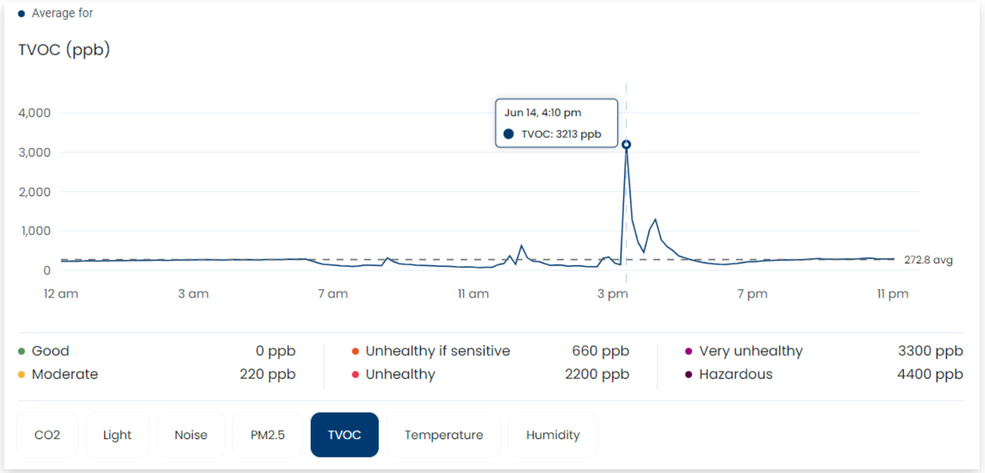
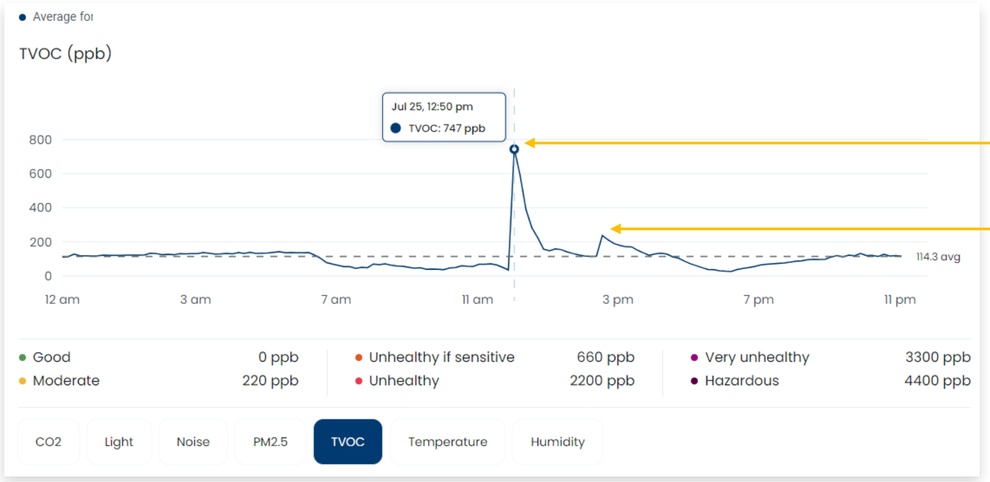
Source happy

UNHEALTHY CONDITIONS





Other

Spray Test

INSIGHT

S1

TVOC Spikes

We have observed unusual Levels of TVOCs in three rooms over the past few months. For Example:

14 June @ 16:00 (Average for that hour): average TVOC Levels over 1200 PPB
Large spike at 16:10 (3213ppb – approaching “very unhealthy”)

Mark as unseen

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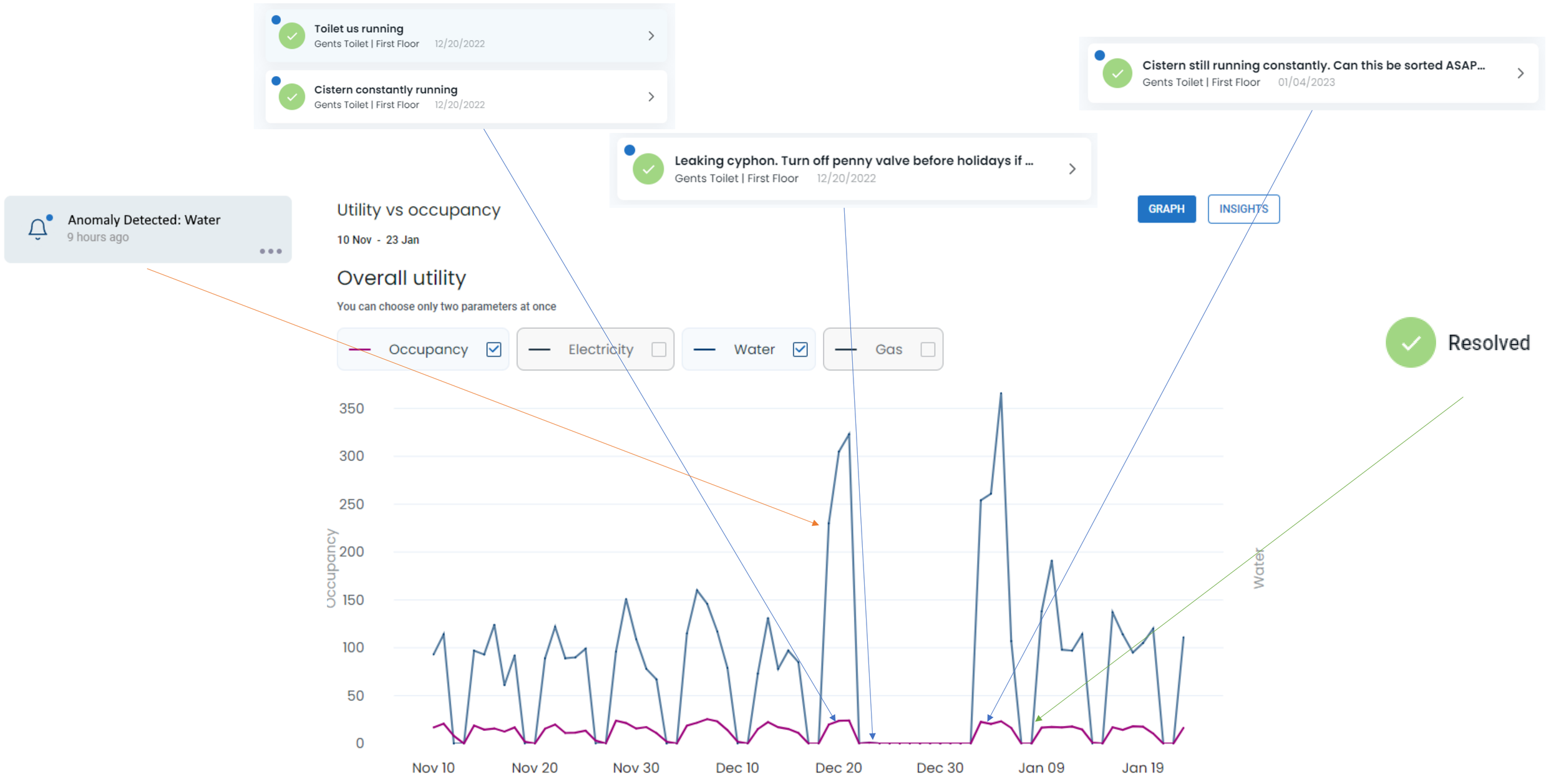
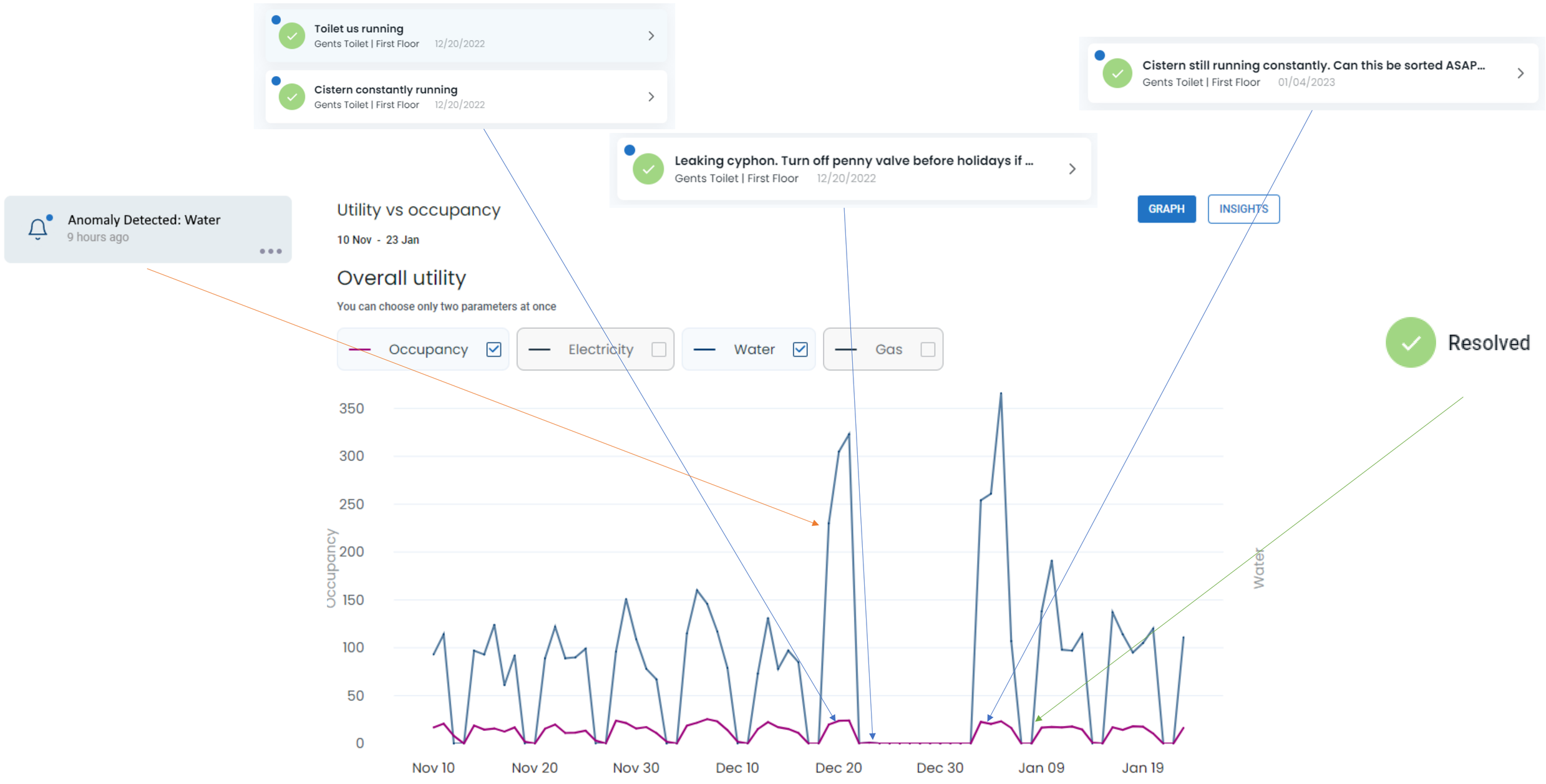
Source happy


Toilet us running
Gents Toilet | First Floor 12/20/2022
Cistern constantly running
Gents Toilet | First Floor 12/20/2022
Cistern still running constantly. Can this be sorted ASAP...
Gents Toilet | First Floor 01/04/2023
Leaking cyphon. Turn off penny valve before holidays if ...
Gents Toilet | First Floor 12/20/2022
Anomaly Detected: Water
9 hours ago
Utility vs occupancy
10 Nov - 23 Jan
GRAPH
INSIGHTS
Overall utility
You can choose only two parameters at once
Occupancy
Electricity
Water
Gas
Resolved
350
300
250
200
150
100
50
0
Occupancy
Water
Nov 10
Nov 20
Nov 30
Dec 10
Dec 20
Dec 30
Jan 09
Jan 19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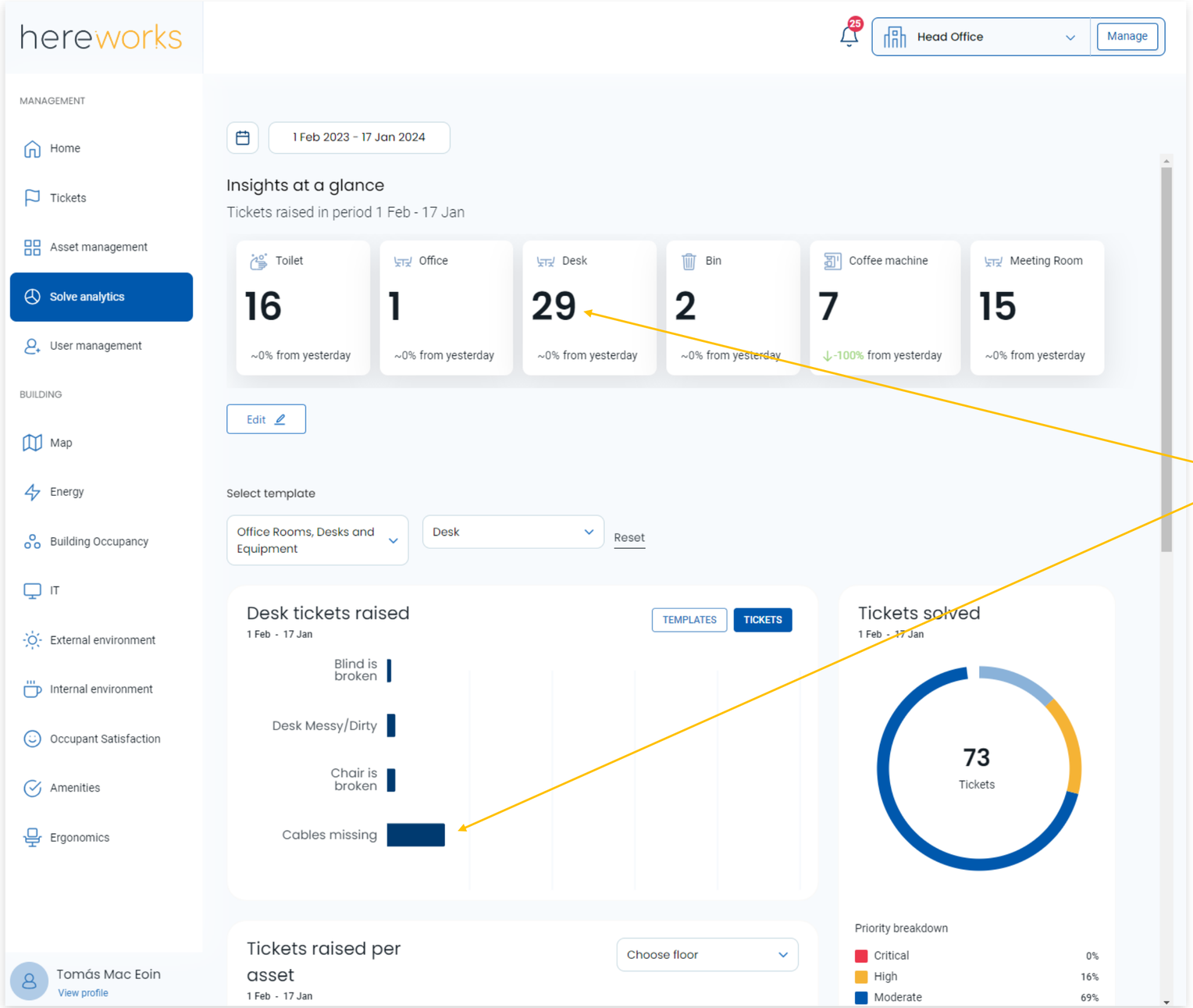

INSIGHT

S1

Recurring Issues

INSIGHT – Recurring issues since 1/2/2023
22 Instances of “Cables missing” for Template: Desk

Mark as unseen

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Fault Detection & Diagnostics (FDD)

What is FDD?

FDD is a software-driven approach which proactively identifies inefficiencies in Building Management Systems (BMS) and other data sources from buildings.

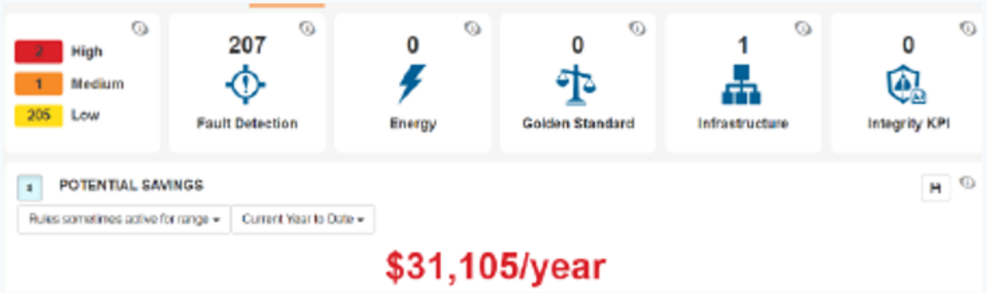
It Prioritises faults, track performance metrics, and adopt proactive maintenance. FDD combines rule-based algorithms and pattern recognition with modelling and ML techniques. The goal? Pinpoint faults impacting energy, comfort, and efficiency in plant operations.

Benefits

Achieve Energy Savings of 5% to 30%

Move from Reactive to Predictive/Pro Active Maintenance

Reduce Reactive Maintenance by 50%



Source KodeLabs & Coppertree Analytics

EXCITING VISION

HUMAN EXPERIENCE IS THE KEY KPI

S
W
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Safety
Workplace
IT
Facilities Team
Technology
Human Resources
Real Estate

What’s Next?

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Knowledge center

Building 1

Manage

MANAGEMENT

- Home
- Tickets
- Assets management
- Solve analytics
- User management

BUILDING

- Map
- Happy Chat BETA
- Occupancy
- Energy
- IT
- External environment
- Internal environment

SUPPORT

- Request support

Collapse sidebar

John Aderson
View profile

New Chat

Welcome to Happy Chat

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

Prompt suggestions for you

- What was Traffic like on 15th July?
- What's the occupancy today?
- Which Room has the Highest TVOC Levels?
- Which room was the busiest yesterday?

Ask a question

CHAT HISTORY

SAVED SESSIONS

MY PROMPTS

SAVED GRAPHS

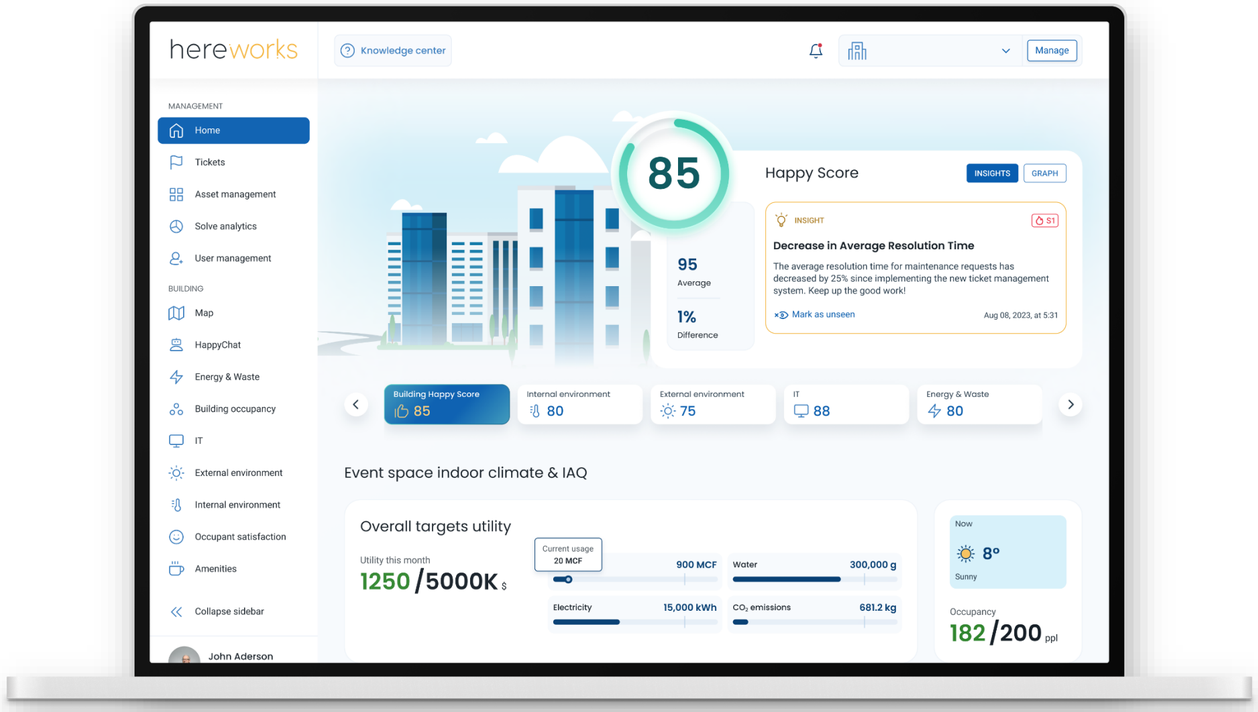
Collapse sidebar

WHAT SKILLS?

- ✓People Skills!
- ✓Workplace Specialists (What makes a great office?)
- ✓Workplace Wellbeing (Workplace H&S)
- ✓Data Analytics / Data Science
- ✓AI Prompt Engineering
- ✓Sustainability Practices
- ✓Waste Reduction and Circularity
- ✓BIM/Revit

- ✓Project Management
- ✓Building Service Engineering

Let’s build a happy workplace together



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Technologies to Connect & Inspire

Tomás Mac Eoin

CEO of Hereworks