



NTT Data
Services

e-Magic

Project Omega – MVP Solution Concept for Energy Management – Screen Examples

May 13, 2022

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Scalable, secure and high-availability platform.



Integrate and normalize all telemetry data



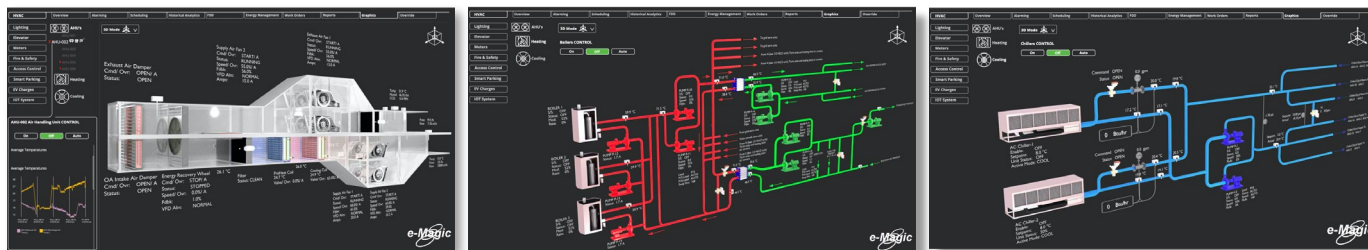
Real-time and historical data

Single pane of glass visualization

Monitoring, alarming, fault detection & diagnosis

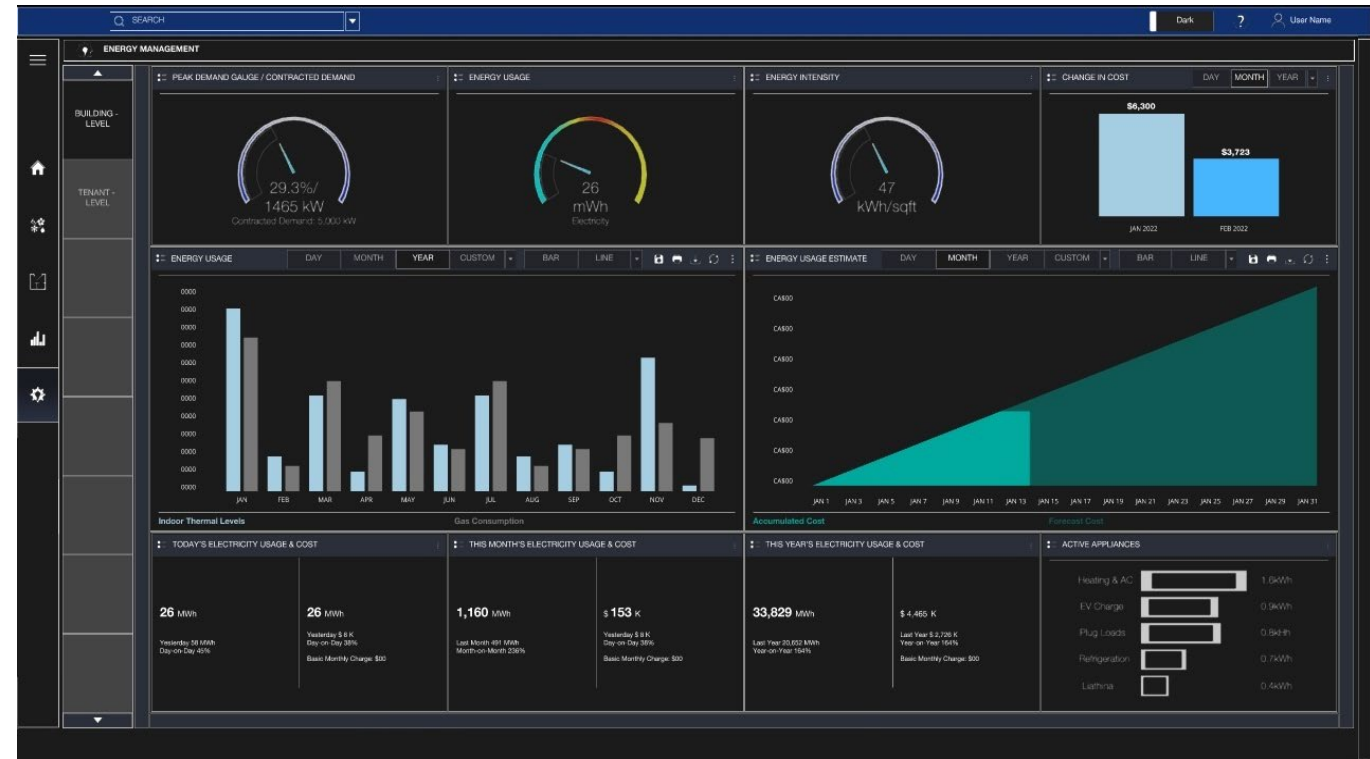
Workflows and business systems

Reporting, analytics, ML and AI

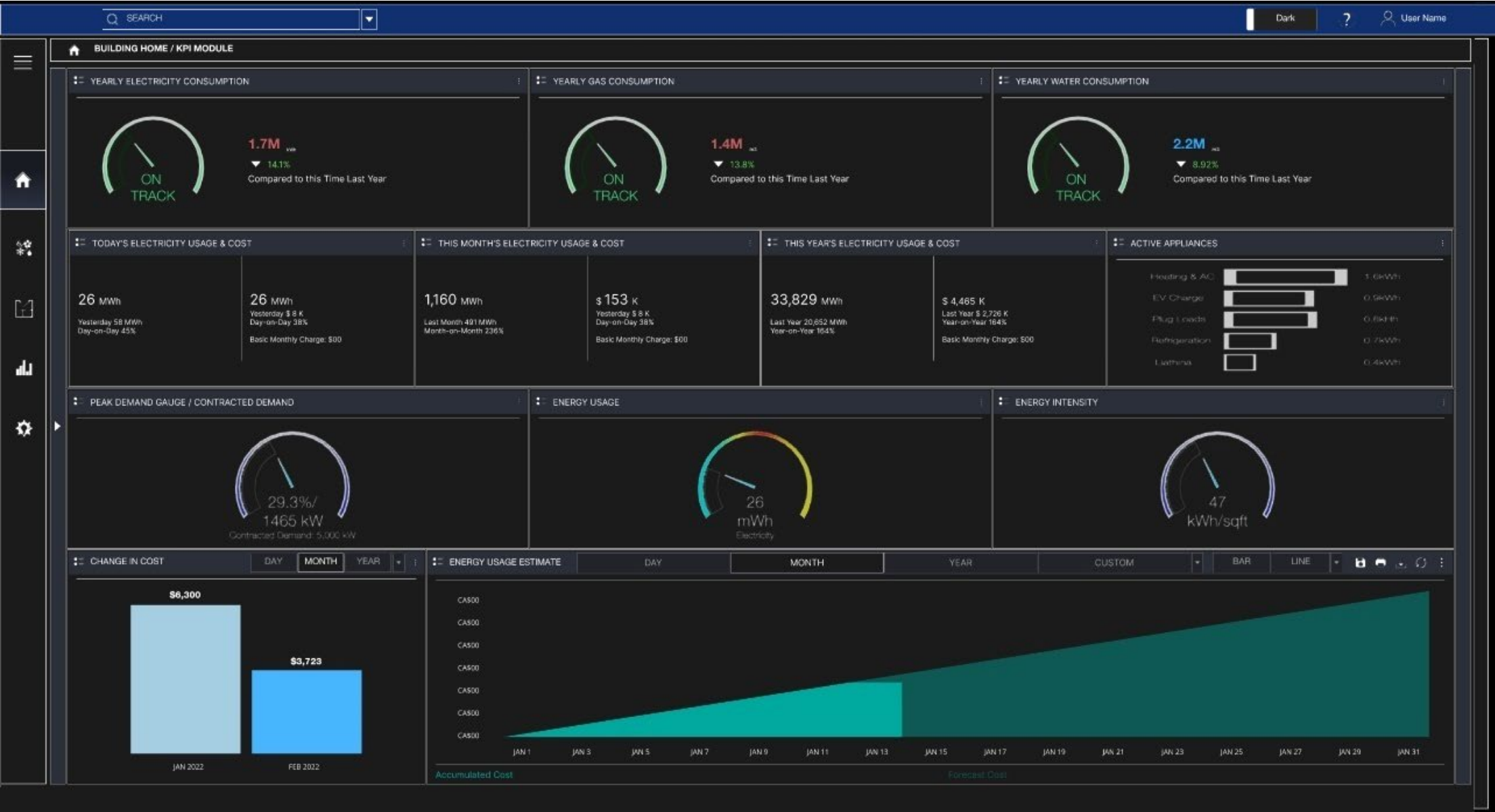


Use Case – Energy Use and Cost

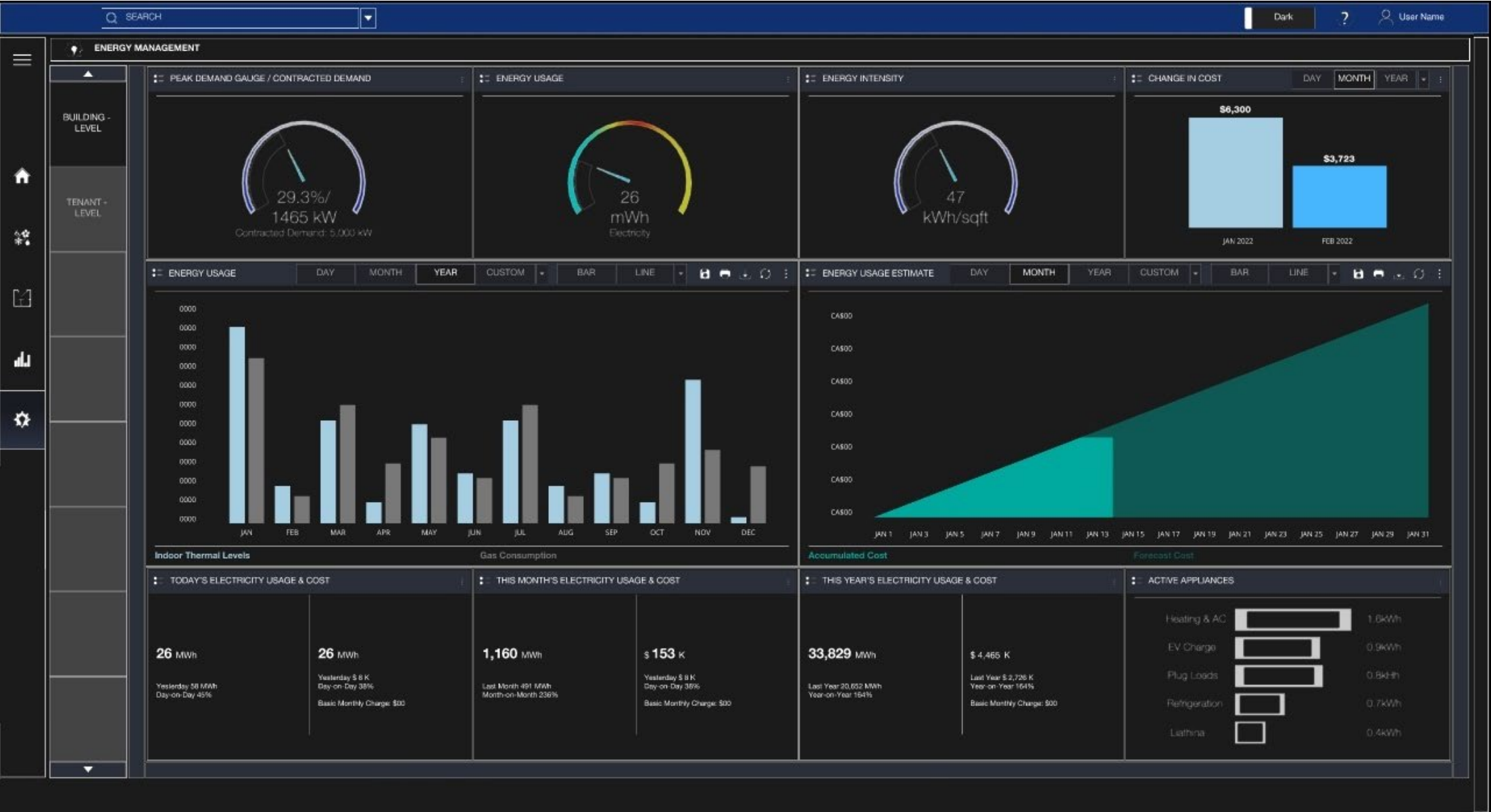
- Situation Awareness of Current Energy Usage
- Meters: Electricity, Gas, Water
- Equipment: HVAC, AHU, etc.
- KPI's:
 - » Peak Demand
 - » Energy Use Intensity (energy per sq ft)
 - » Cost, Change in Cost



Facility Dashboard



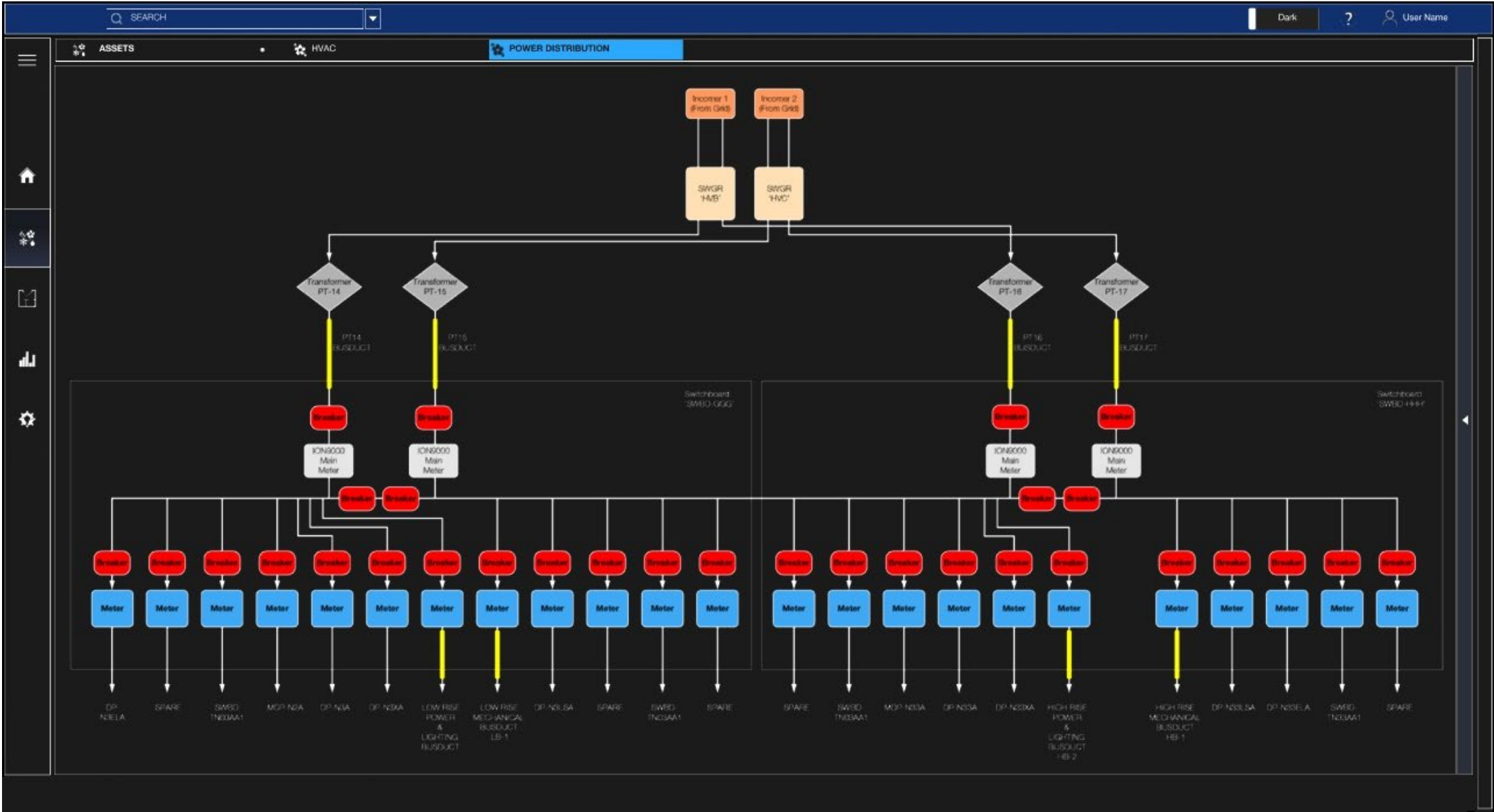
Energy Management Overview



Energy Management – Tenant View



Asset View – Power Distribution



Asset View – HVAC



Fault Detection and Diagnosis (FDD)

- Address issues impacting energy use and waste
- Algorithms based on Human Understanding of equipment problems
- Recommendations for correction
- Project cost savings \$ to support prioritization

BLDG	Location	Asset	Fault Name	Fault Activated Time	Fault Status	Potential Savings(\$)	Rule Categories
ASTARC	FLR_02	AHU3	Cooling Failure	2021-12-04T05:02:00	ACTIVE	1000	Fault, Energy, Maintenance
ASTARC	FLR_02	AHU3	Heating Failure	2021-12-04T19:31:00	ACTIVE	1000	Fault, Energy, Maintenance
ASTARC	FLR_02	AHU3	Cooling Valve Leaking	2022-01-03T19:31:00	ACTIVE	1100	Energy, Maintenance
ASTARC	FLR_01	AHU1	Cooling and Heating Simultaneously	2021-12-23T19:31:00	ACTIVE	1500	Energy, Maintenance
ASTARC	FLR_02	AHU3	High Return CO2 Levels	2021-11-15T06:02:00	ACTIVE	1000	Comfort, Maintenance
ASTARC	FLR_02	AHU3	Zone Humidity Outside of Comfort Limits	2021-12-25T11:15:00	ACTIVE	750	Comfort
ASTARC	BASEMENT	BLR1	Boiler Running During Unoccupied Periods	2021-11-25T03:03:00	ACTIVE	4500	Energy
ASTARC	BASEMENT	BLR2	Boiler Running During Unoccupied Periods	2021-10-31T03:03:00	ACTIVE	4500	Energy
ASTARC	BASEMENT	BLR3	Boiler Running During Unoccupied Periods	2021-11-05T03:03:00	ACTIVE	4500	Energy
ASTARC	FLR_02	AHU3	High Return Air Temperature	2022-01-10T06:02:00	ACTIVE	500	Energy
ASTARC	BASEMENT	CH1	Chiller Running During Unoccupied Periods	2022-01-03T19:31:00	ACTIVE	3000	Energy
ASTARC	BASEMENT	CH2	Chiller Running During Unoccupied Periods	2022-01-12T13:03:00	ACTIVE	3000	Energy
BARRICK	FLR_02	AHU3	Heating Failure	2021-12-04T19:31:00	ACTIVE	1000	Fault, Energy, Maintenance
BARRICK	FLR_01	AHU1	Cooling and Heating Simultaneously	2022-01-19T09:31:00	ACTIVE	1500	Energy, Maintenance
BARRICK	FLR_02	AHU3	Cooling Failure	2021-10-04T05:02:00	ACTIVE	1000	Fault, Energy, Maintenance
BARRICK	FLR_02	AHU3	High Return CO2 Levels	2021-11-15T06:02:00	ACTIVE	1000	Comfort, Maintenance

https://oihihov4n4qjsdns.centralus.cloudapp.azure.com:86/ClientApp/twxddd/Description.html?faultGuid=78e44884-9a1c-47e2-af09-0dfd3...
oihihov4n4qjsdns.centralus.cloudapp.azure.com:86/ClientApp/twxddd/Description.html?faultGuid=78e44884-9a1c-47e2-af09-0dfd37711...

Fault Description:

This rule detects when the AHU fails to reach the requested level of heating. The Discharge Air Temperature is too low, and should be higher than the Mixed Air Temperature.

Probable Causes:

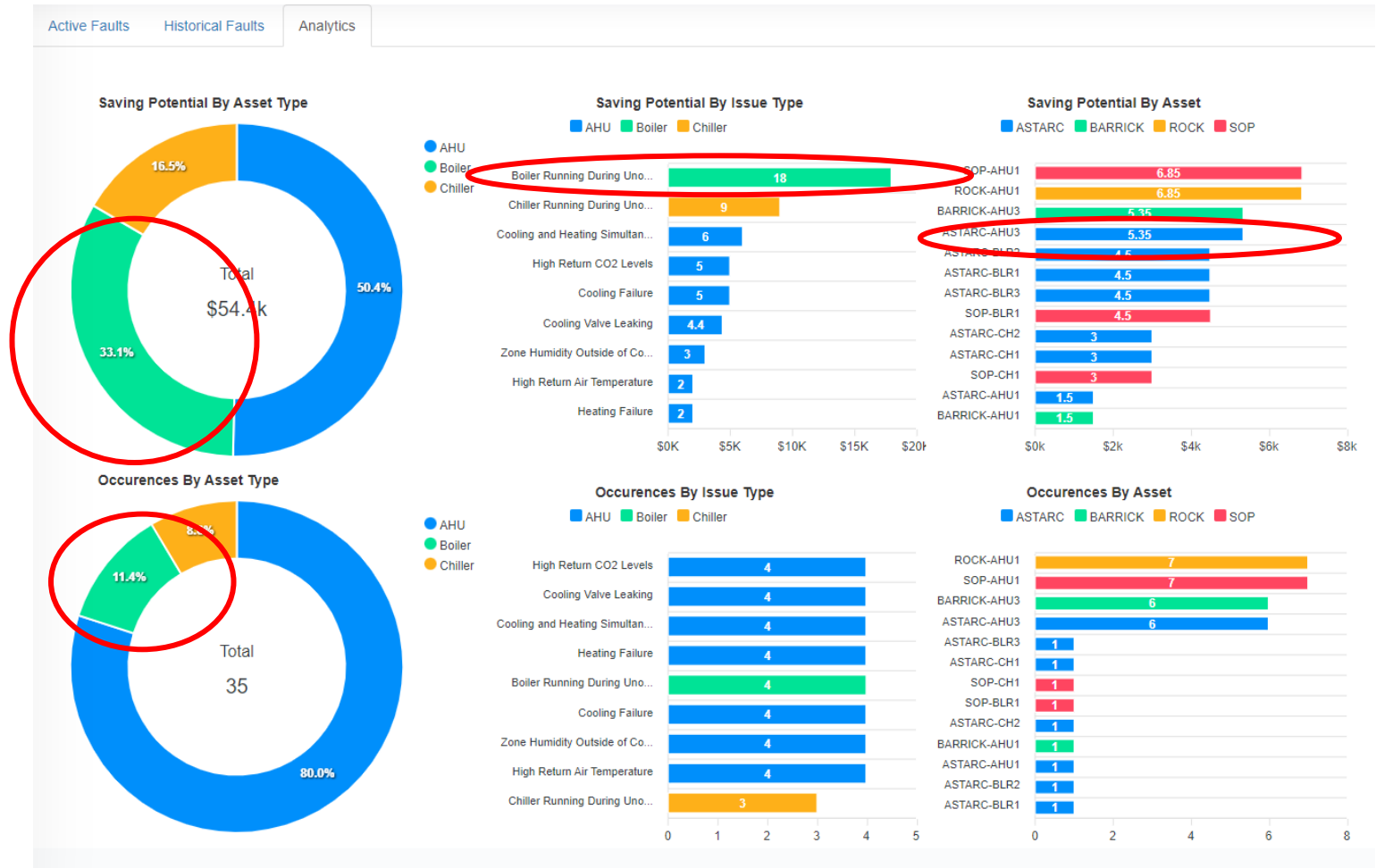
For a given amount of time, the Heating Valve Position greater than a threshold and the Discharge Air Fan in ON, Mixed Air Temperature is within a threshold of the Discharge Air Temperature.

Possible Solution:

Check proper function of Discharge Air Temperature sensor
Check proper function of Mixed Air Temperature sensor
Check cooling coil valve
Check heating coil valve
Check that flow through heating coil is uninterrupted
Check that heating coil hot water temperature is at or near setpoint

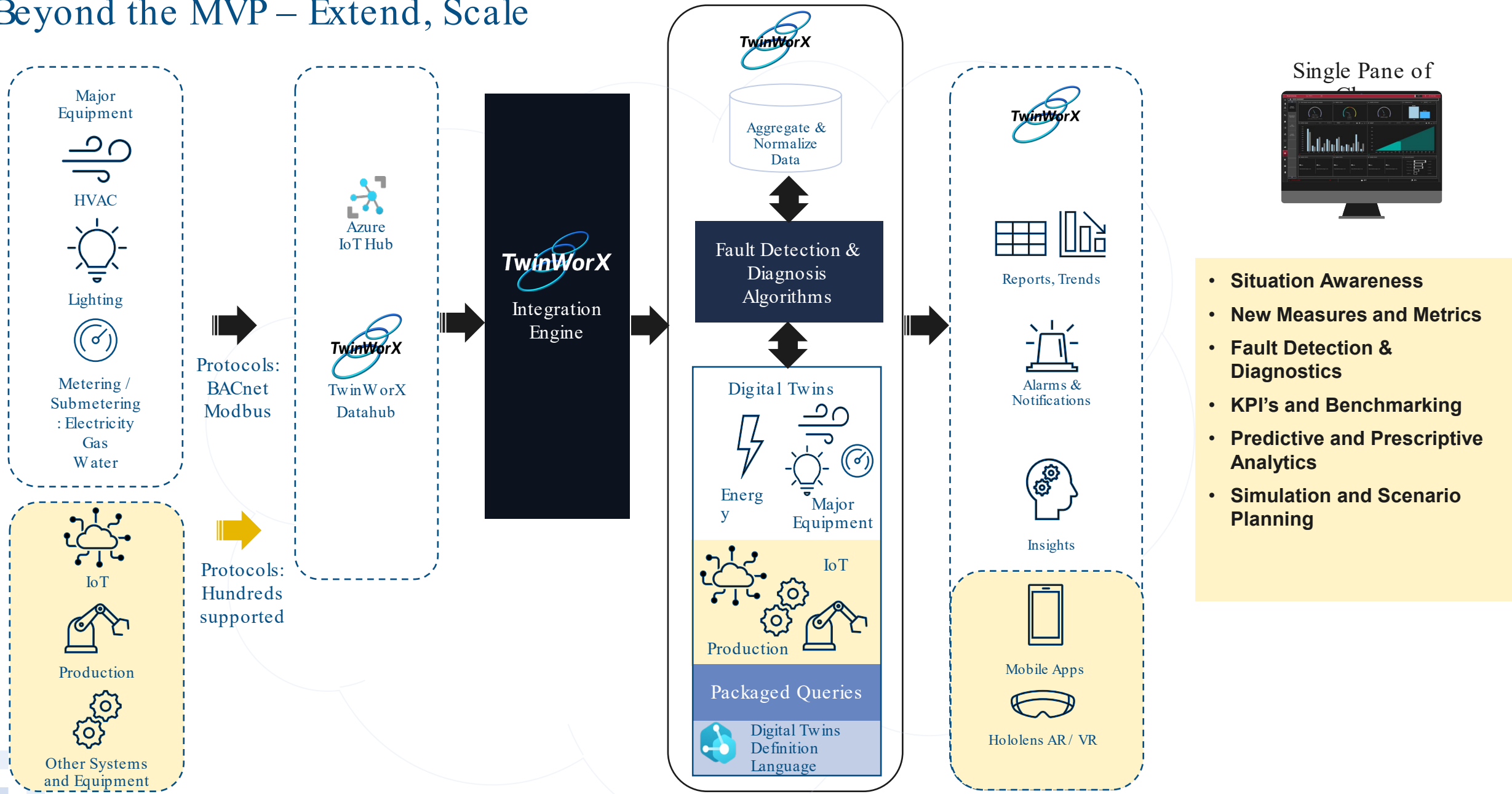
FDD Analytics and Insights

- Identify areas with most issues
- Understand impact of action / inaction
- Prioritize and schedule



Issues and Cost concentrated on 'BARRICK-AHU3'

Beyond the MVP – Extend, Scale



- **Situation Awareness**
- **New Measures and Metrics**
- **Fault Detection & Diagnostics**
- **KPI's and Benchmarking**
- **Predictive and Prescriptive Analytics**
- **Simulation and Scenario Planning**



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