

Digital Twin at OCW : Another brick of Digital Transformation

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OCW Nagpur

Water Concession - (PPP Veolia NMC)

Nagpur Water

- Location : Geographical Centre of India.
- Operation Zones : 10
- Command Area : 109
- Population: 3.5 million
- Area : 217 Sq. Km
- Total water Supply – Approx 780 MLD
- No of Connections- 4.19 Lakhs
- Total Distribution Network – 4,428 KM (2051KM in the year 2011-12)



Gradual Improvement in 24X7 Project

From 2012 to 2024



Nb of converted 24/7 areas are increased every years

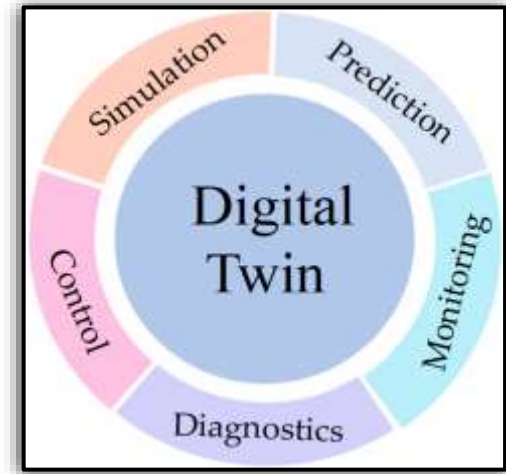
Water Infrastructure Asset



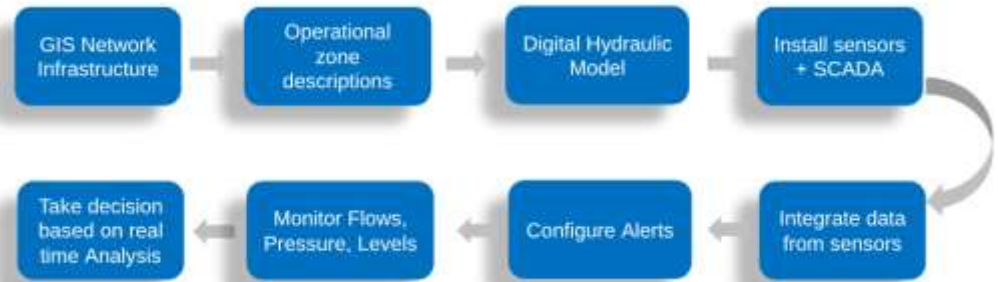
Digital Twin : a digital brick of Veolia Hubgrade

Veolia Hubgrade

- Smart Centralized monitoring and data management platform
- Dashboards provide real-time monitoring, historical trend analysis, and predictive analytics to support proactive maintenance and operational optimization.



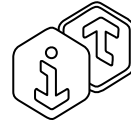
OCW's Digital Twin : Methodology applied



Tools : Bentley's WaterGEMS & WaterSight Digital Twin Solution



Hydraulic Modeling Application



Bentley
Digital Twin - WaterSight

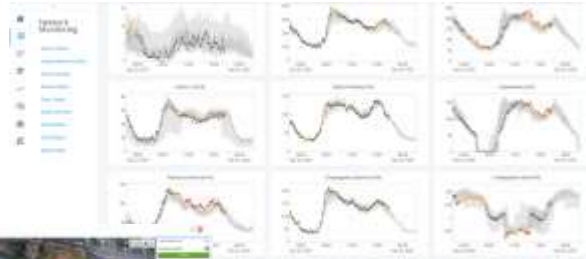

Cloud based
solution

Engineering and Planning



Field
Sensor
Data

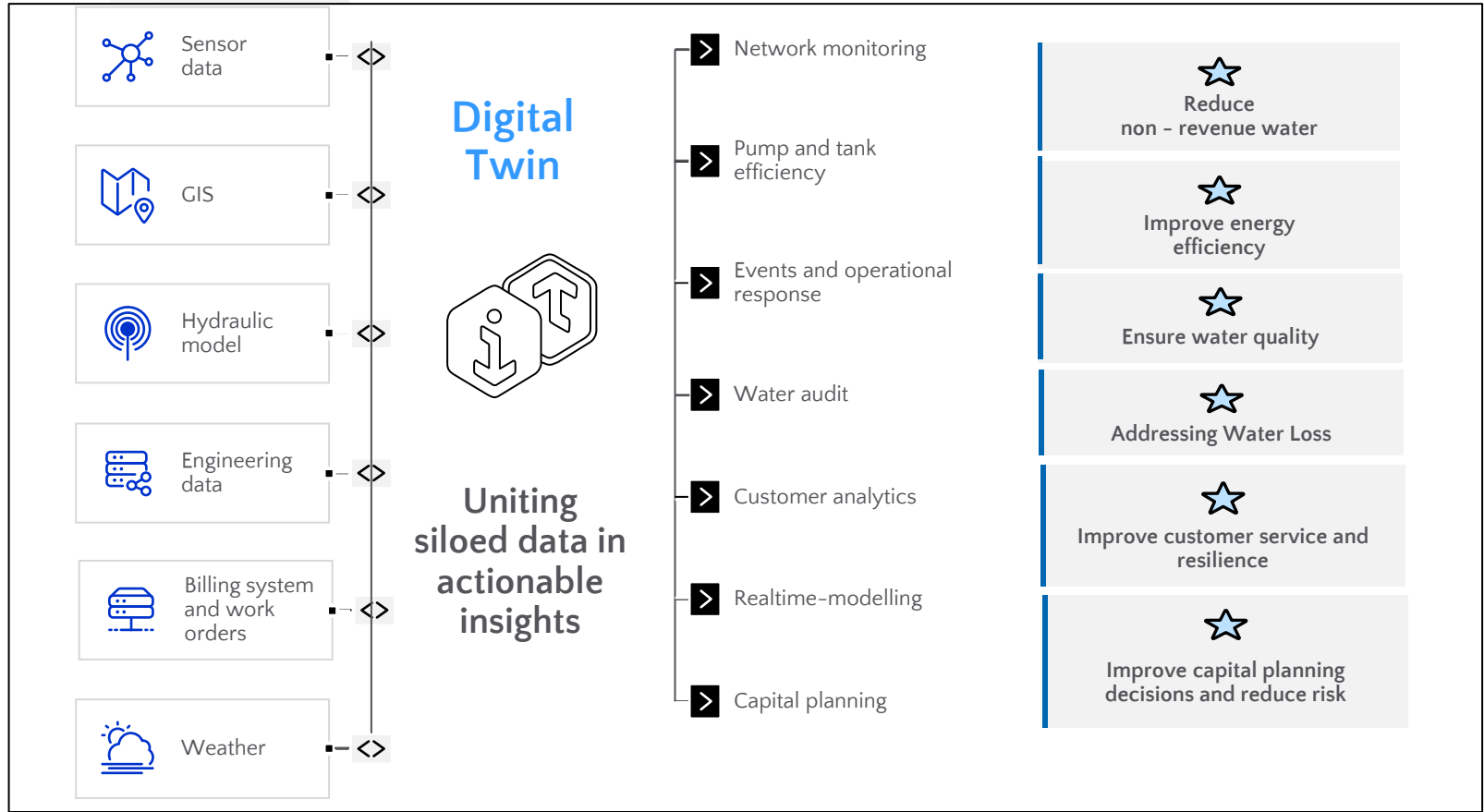
Operation Support



Management / Alerts



Why? : Strong data integration from Bentley's platform...



Operational Applications with Digital Twin at OCW

Real Time Simulations

Hydraulic Model fed by real time data from sensors

Water Balance

Customer metering analysis

Network Monitoring

Reservoir Level

Pump Efficiency

Alarming



Real Time Simulations

Limitations:

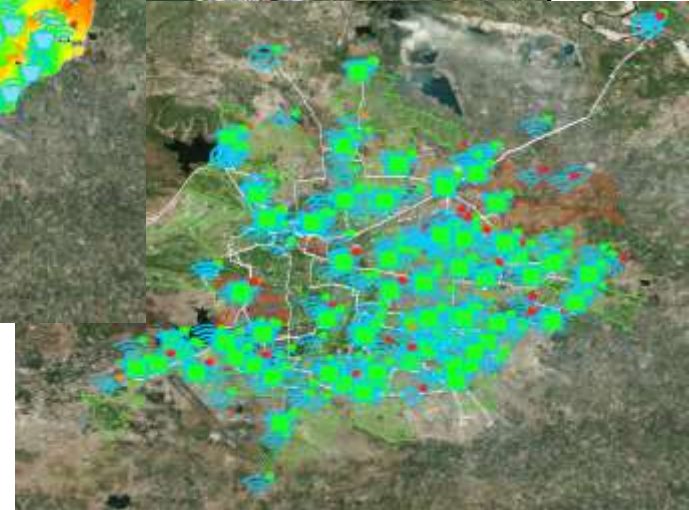
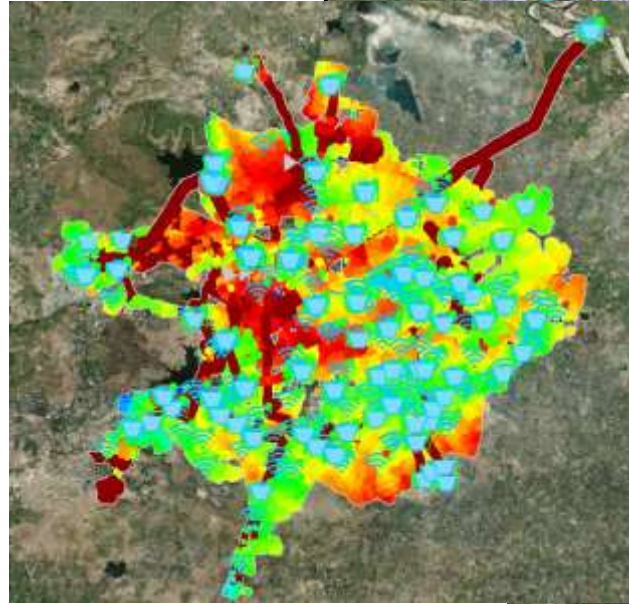
Calibration accuracy due to unknown infrastructures

Results are more qualitative than quantitative

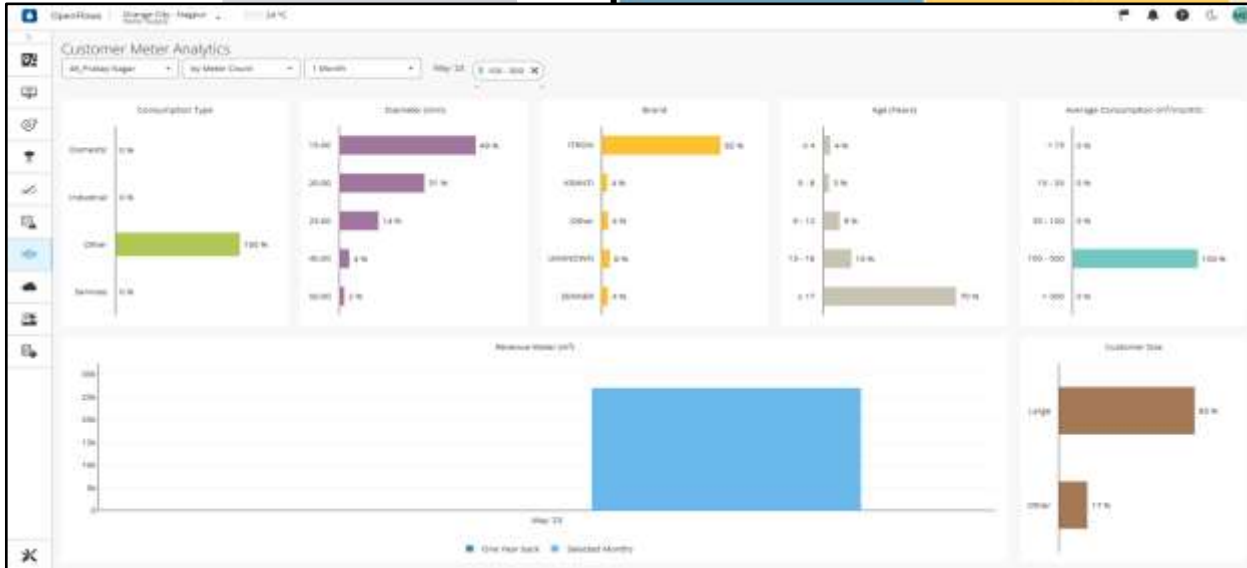


Results:

At this level, location of pressure issues are more important than the quantification of the pressure value itself.



Water Audit



Network Monitoring

Pumps

Energy cost Efficient operation

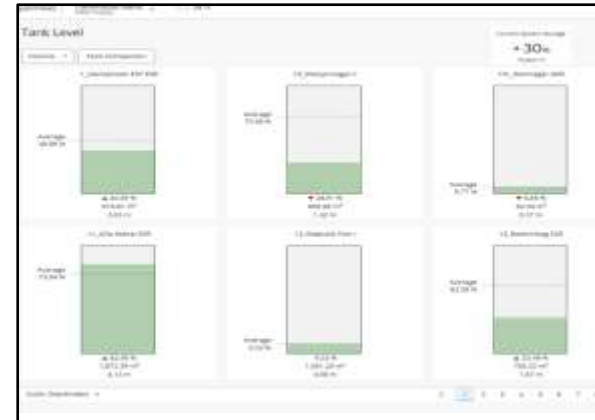
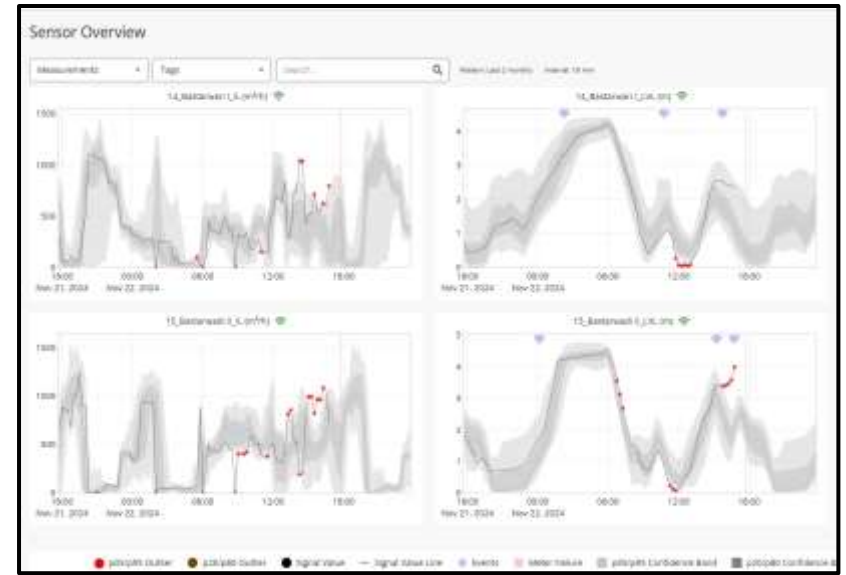
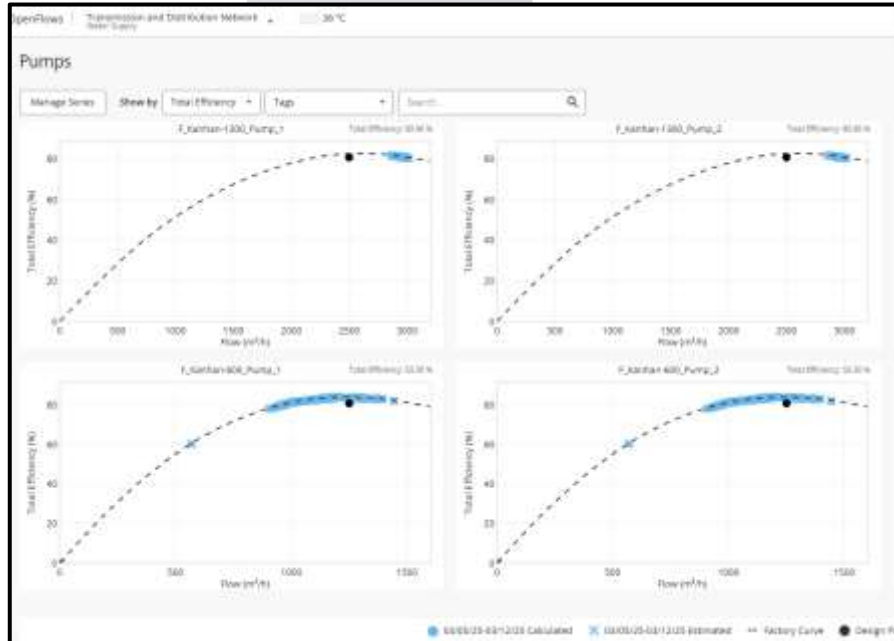
Pump flow and Discharge Pressure

Sensors

Graphs

Comparison

Reports

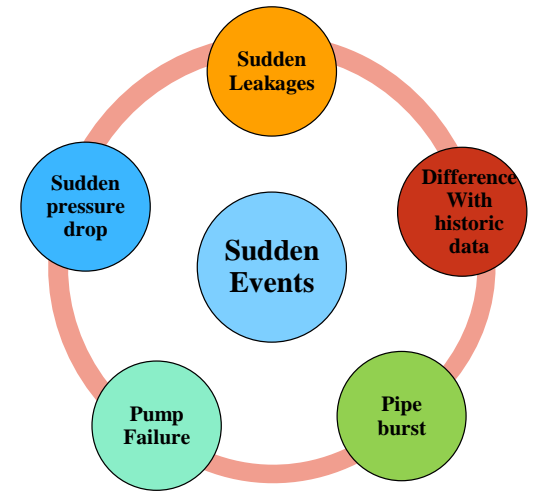
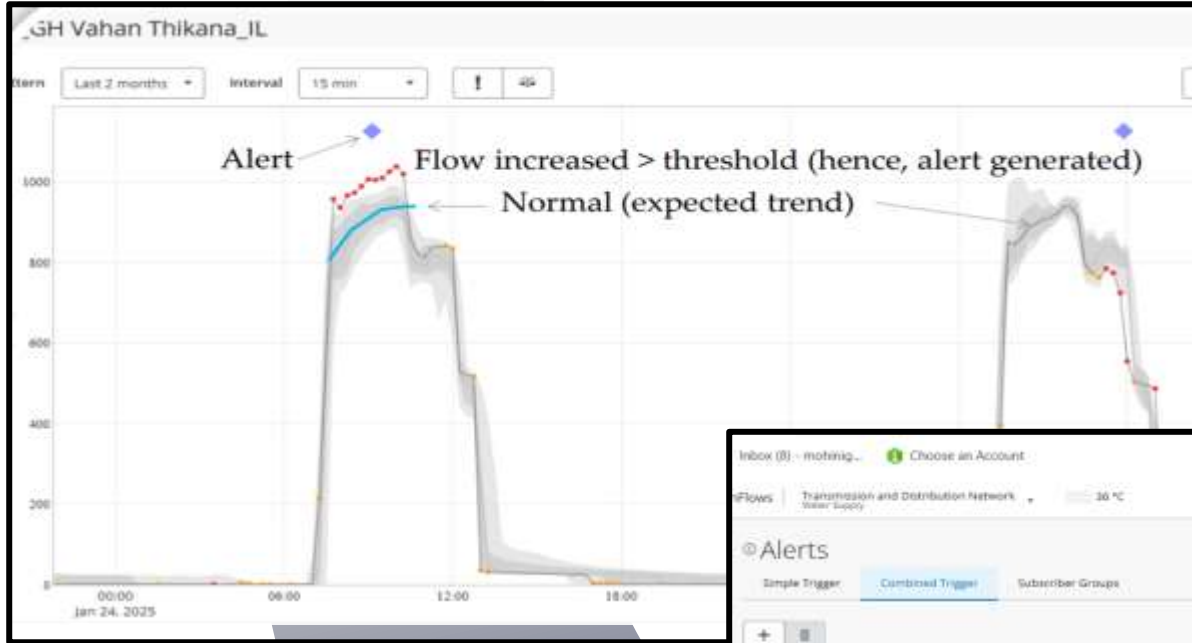


Tanks

Tank Levels

Tank Comparison

Alerts



- Flow
- Pressure
- Level

The screenshot shows an 'Alerts' management interface. It includes a 'Choose an Account' button, a 'Flows' dropdown set to 'Transmission and Distribution Network', and a temperature indicator of '30 °C'. The 'Alerts' section has tabs for 'Simple Trigger', 'Combined Trigger', and 'Subscriber Groups'. Below is a table of alert configurations:

Name	Condition	Min. Duration	Active
Low pressure NAHDANVAN ESR_CMP-1.1	IF 1_NAHDANVAN ESR_CMP-1.1 Pressure 15 min Absolute High 0.0...	0.5 hours	🔴
Low Pressure 44_JAITALA QSR_CMP-1.1	IF 44_JAITALA QSR_CMP-1.1 Pressure 15 min Absolute High 0.0E...	0.5 hours	🟢
Low Pressure 57_TAKL/SEEM ESR_CMP-1.1	IF 57_TAKL/SEEM ESR_CMP-1.1 Pressure 15 min Absolute High 0...	0.5 hours	🟢
Low Pressure 57_TAKL/SEEM ESR_CMP-2.1	IF 57_TAKL/SEEM ESR_CMP-2.1 Pressure 15 min Absolute High 0...	0.5 hours	🟢
Low Pressure 80_AMBUT/ITALA ESR_CMP-1.1	IF 80_AMBUT/ITALA ESR_CMP-1.1 Pressure 15 min Absolute High...	0.5 hours	🟢

Conclusion

Integrated to Hubgrade supervision ...



Using a digital twin at OCW :

- Bentley's WaterGEMS & WaterSight Digital Twin Solution covering OCW needs
- Integrated tool to Veolia Digital Transformation project,
- Already an operational tool providing real time supports to management and operational teams,
- Long term improvement system which will become more accurate with the time

⇒ **More predictive & with AI tools embedded.**

**THANK
YOU**