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# Smart One Water – Integrating Workforce, Governance, and Technology Innovation

NEWEA 2022 Annual Conference & Exhibit
May 26, 2022

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Jacobs Engineering Group

# Presentation Overview

- What makes a Smart Water Program?
- How do I get started?
- What can success look like?
- Summary
- Questions?

# What Makes a Smart Water Program?

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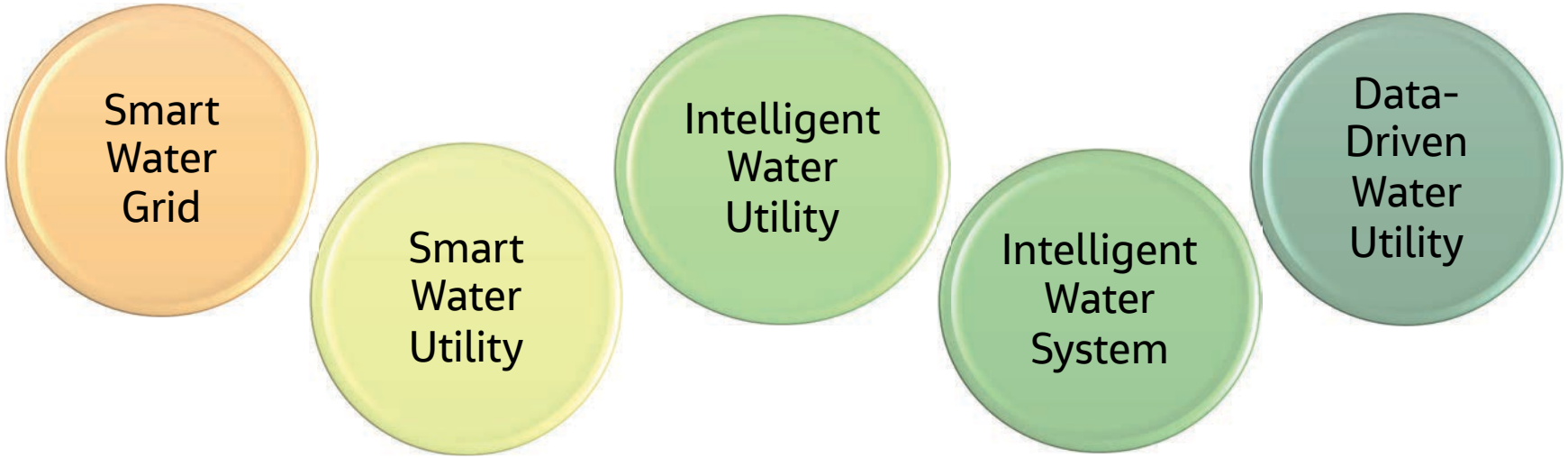
# The Data Revolution is Here

# Lots of Acronyms, what do they mean?

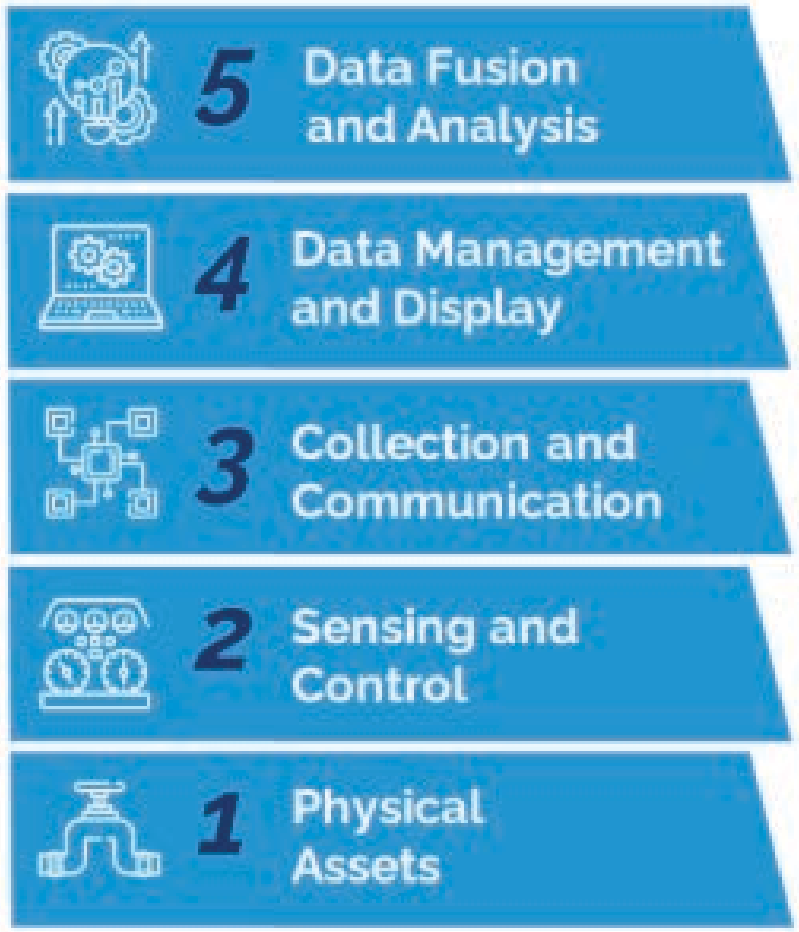



**Aligns with the "Digital Organization" in other industries**

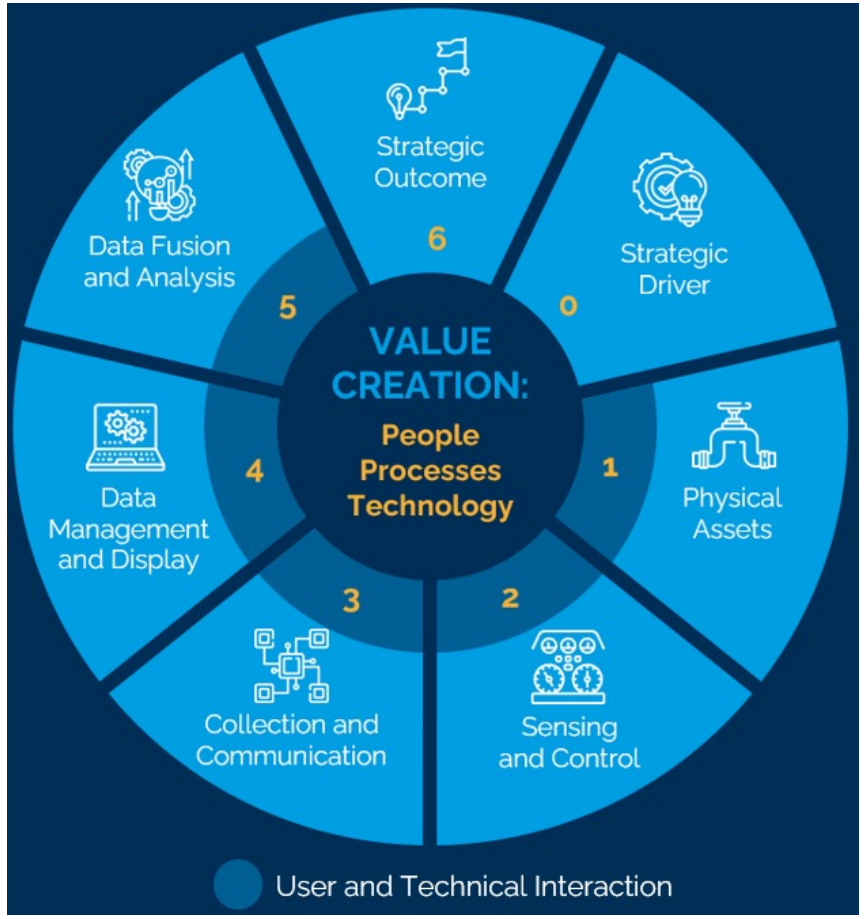
- Overlays data collection, information creation, and insight to improve efficiency and decision making

Is it just about technology?

# Paradigm Shift – Smart Water Network Forum (SWAN)




2010 – Technology Framework




2021 – Value Creation Framework

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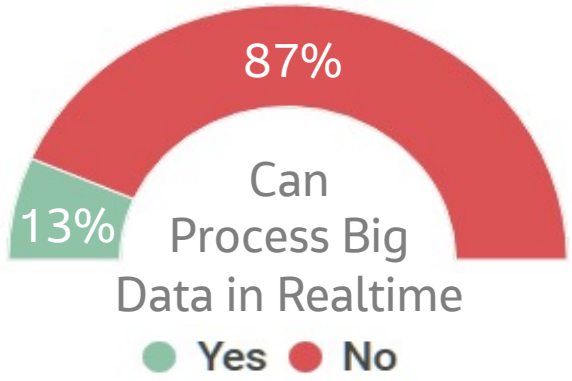
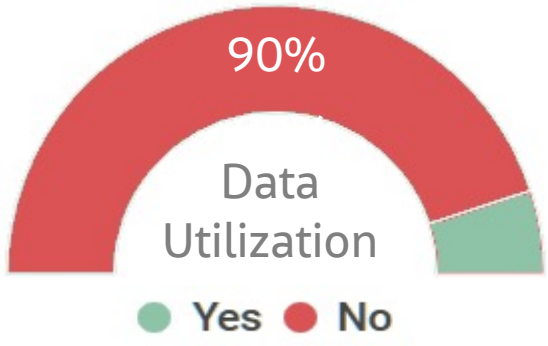
# Applying Smart Water in Realtime

- Data challenges facing water utilities

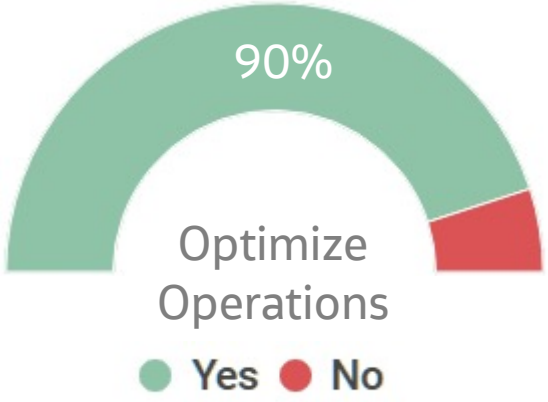


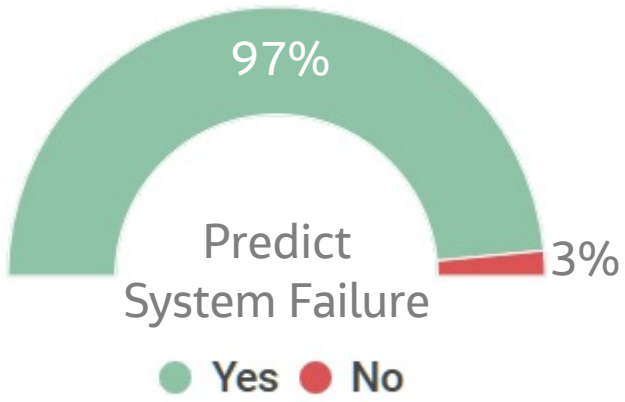



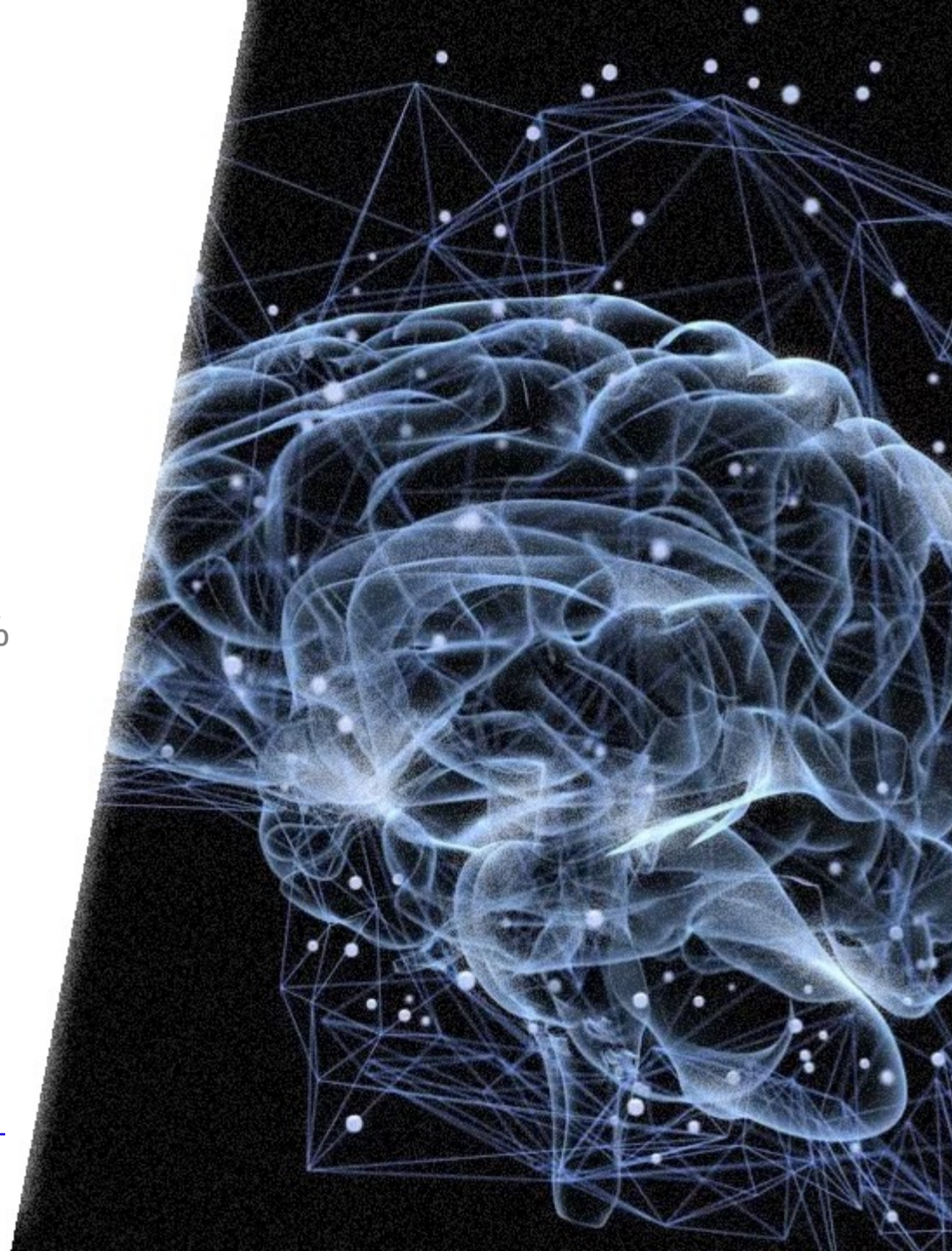

- The value of now
  - There is certain information whose **value decays exponentially over time**. Perform real-time analytics on data to provide real-time intelligence

# Digital Expectations

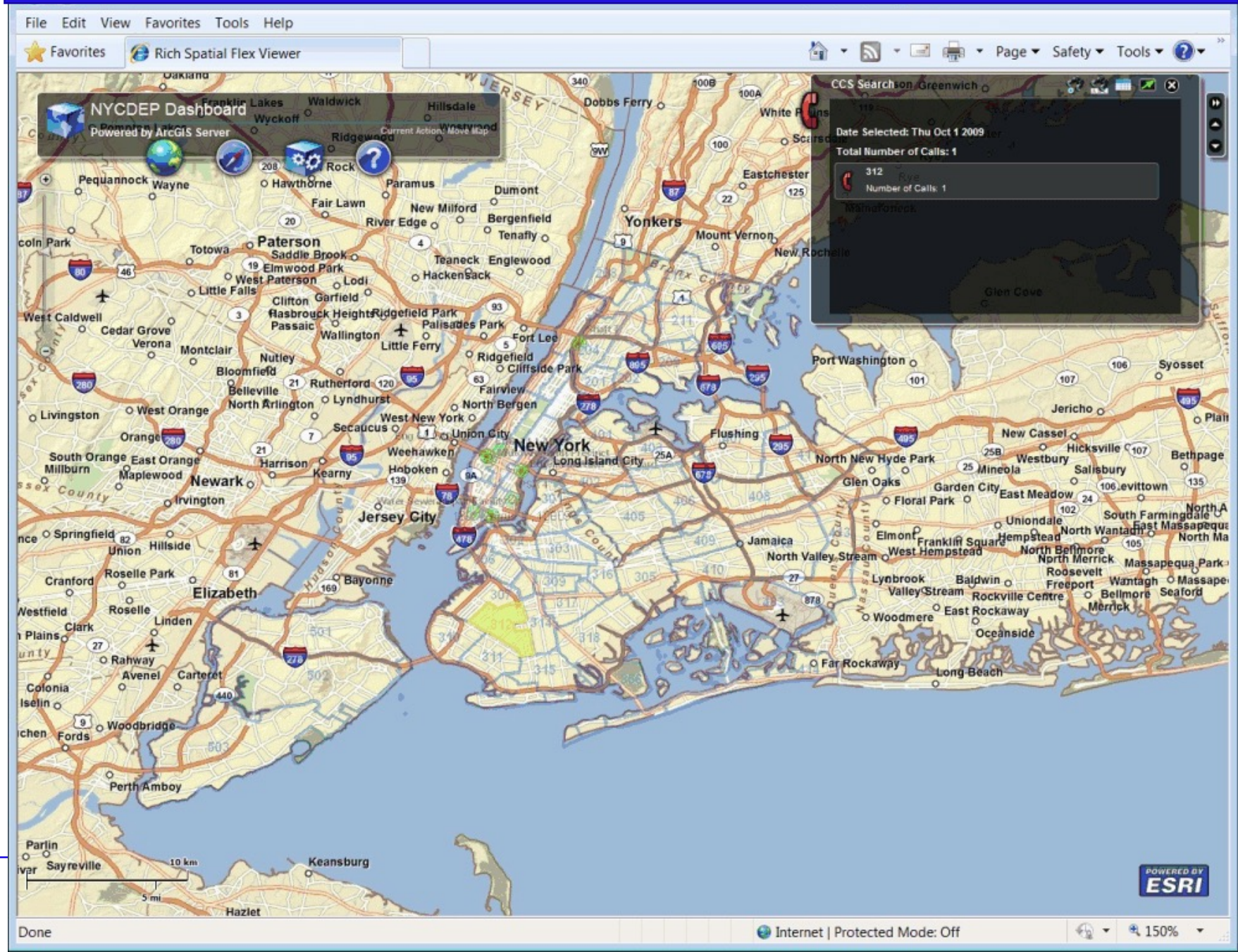
- Benefits of implementing smart water solutions



# Real-time Dashboard



# How does a utility get started?

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# Characteristics of a Smart Water Utility

# Strategy & Vision

**The approach and foresight for development of a digital water utility**

- Enables development of internal governance and management processes
- Promotes collaborative relationships with stakeholders
- Guides a successful digital water utility transformation

# Risk & Resiliency

**How the utility uses information to reduce risk and enhance resiliency**

- Focuses on the utility's ability to plan, proactively identify and manage disruptions, and recover quickly
- Includes risk and resiliency components as a design element
- Data architecture supports resiliency
- Uses analytic tools to identify impacted customers based on system failures and operational outages

# Workforce

**How information optimizes the workforce to advance the digital strategy**

- Optimally manages staff core to meeting the utility's goals
- May require additional workforce
- Changes to organization remove organizational data latencies
- Roles may change due to digitization of the utility
- Training optimizes use of tools

# Asset Management

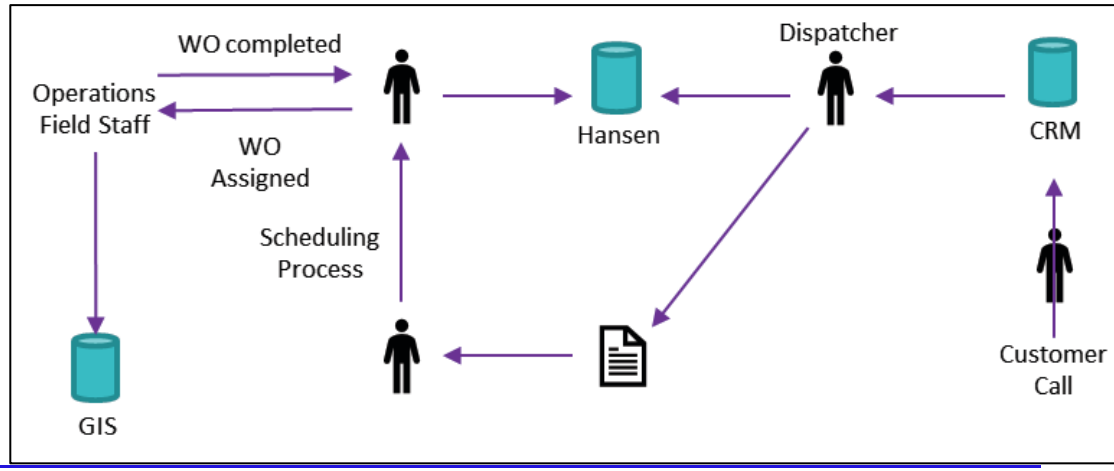
## How information is being used to manage assets

- Considers capabilities that support optimal management of the organization's assets
- Focus on predictive and planned management of assets
- Information helps optimize the availability of assets

# Data Management

**How information is collected, its quality maintained, transmitted to the correct point of analysis**

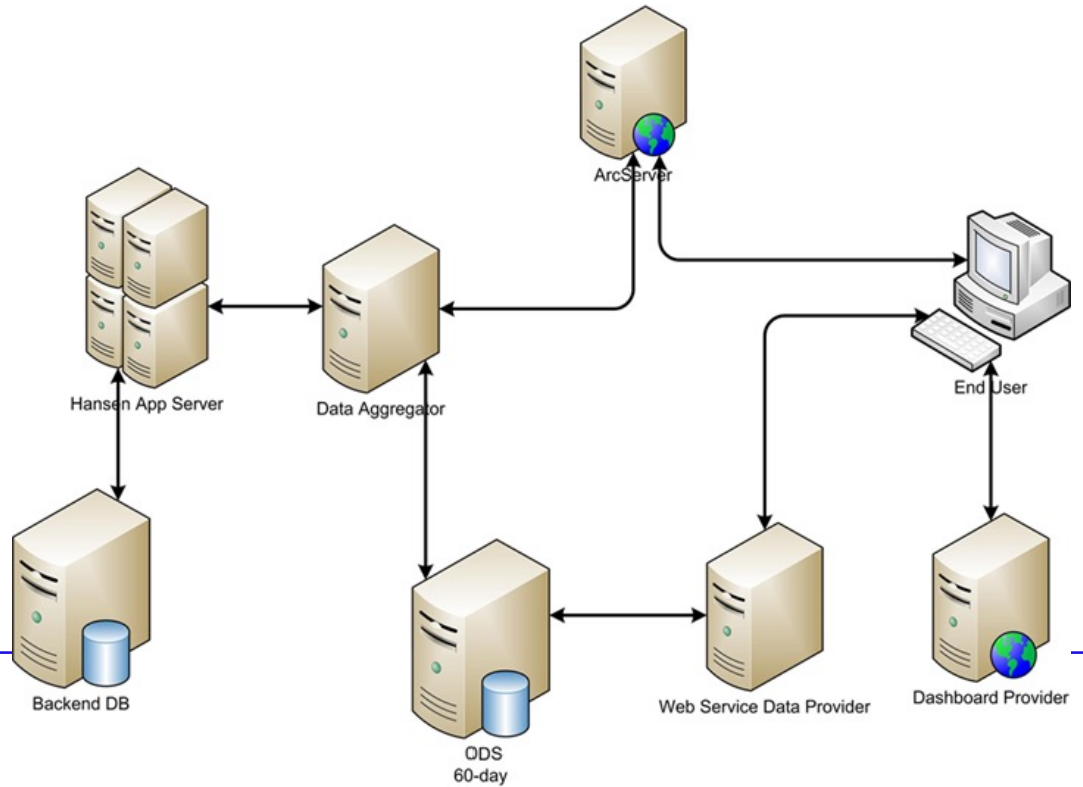
- Data as the input must be accurate and available for processing
- Includes measurements from sensors, customer complaints or other interactions, social media posts, work order details, etc.
- Data transmitted using technologies such as radio, copper cable, fiber cable, or cellular
- Minimizes “dark data” – where data goes to die
- Data system of record – single source of truth



# Integration & Interoperability

**How information management systems are integrated across the organization**

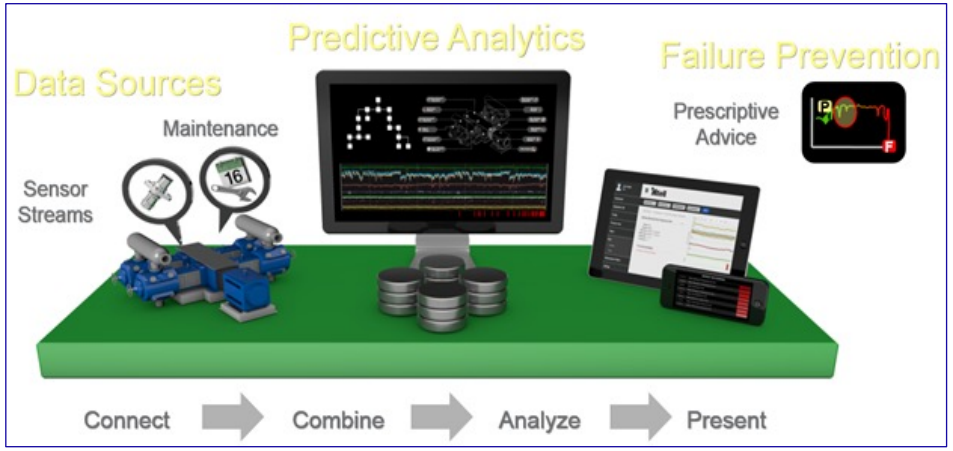
- Manages and fuses information to achieve cross-discipline interoperability
- Enables real-time situational awareness to drive informed decisions
- Connect and integrate all systems



# Analytics & Information Use

**Methods used for data analysis to produce useful, actionable information**

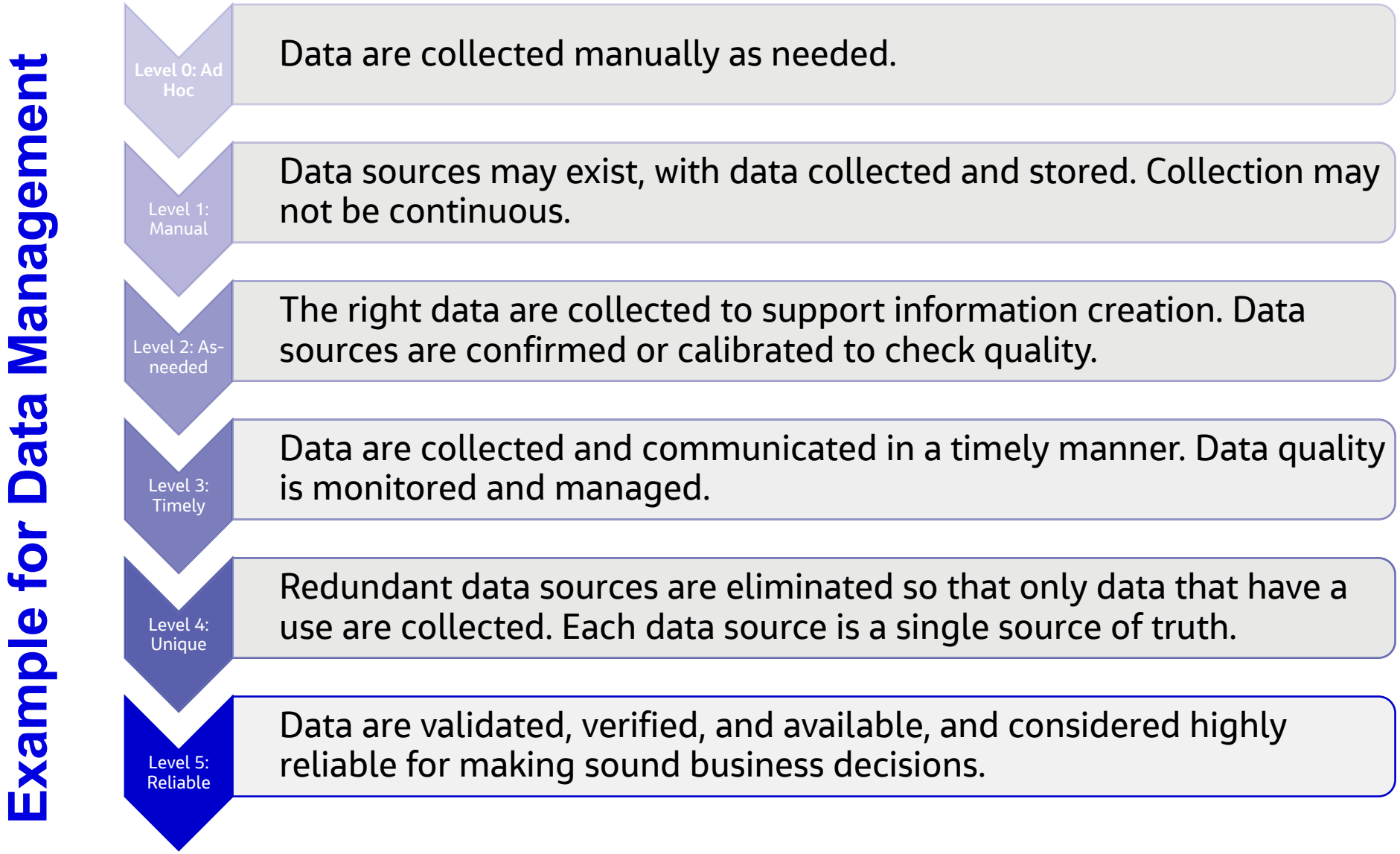
- Converts data into information – uses analytics with automated algorithms
- Increasing maturity reflects automated operations with significant flexibility and a high degree of situational awareness
- Real-time situational awareness to drive informed decisions
- Define, document and prioritize core analytics use cases



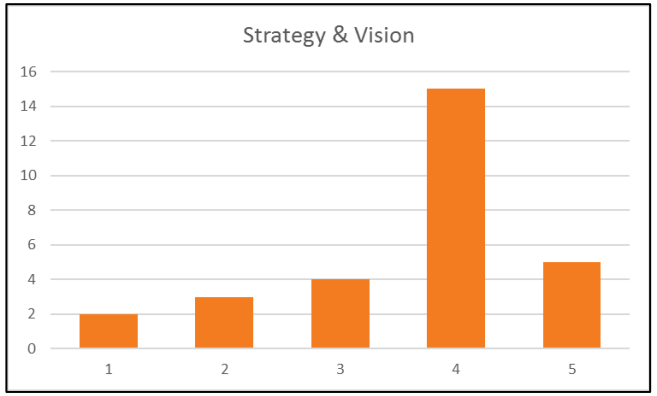
# The Smart Water Utility Maturity Levels

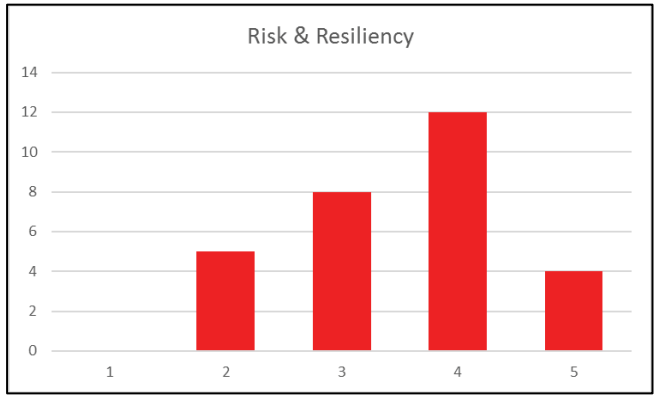
| | |
|---|---|
| **Level 0: Baseline** | The level before any significant steps are taken toward implementing digitization |
| **Level 1: Initiating** | Exploring the options, developing a strategy, and conducting isolated pilots to test technology and processes |
| **Level 2: Enabling** | Having a clear utility-wide strategy and investing in pilots based on the strategy |
| **Level 3. Integrating** | Merging technologies and processes across the utility and demonstrating cross-functional measurable benefits |
| **Level 4: Optimizing** | Fusing information across the utility and potentially beyond the utility (e.g., customers, regulators) to increase measurable benefits |
| **Level 5: Pioneering** | Innovating as an industry leader |

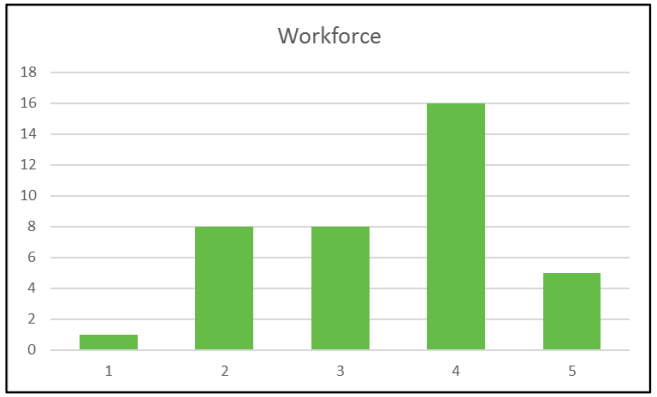
# Maturity Levels Defined for Each Category

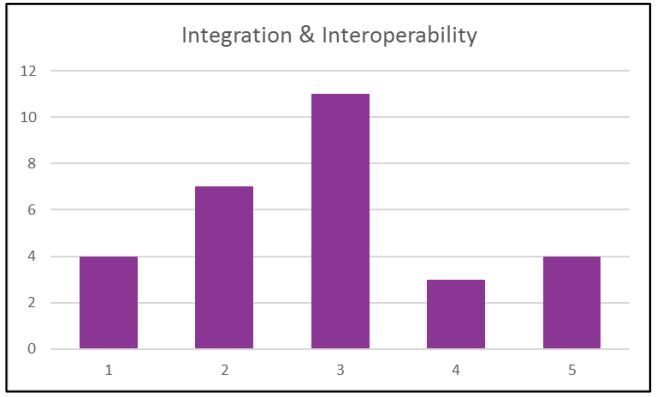


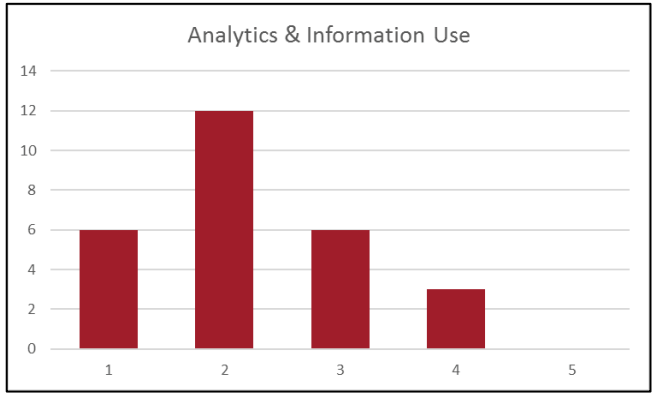
# Consolidated Results





# What can success look like?



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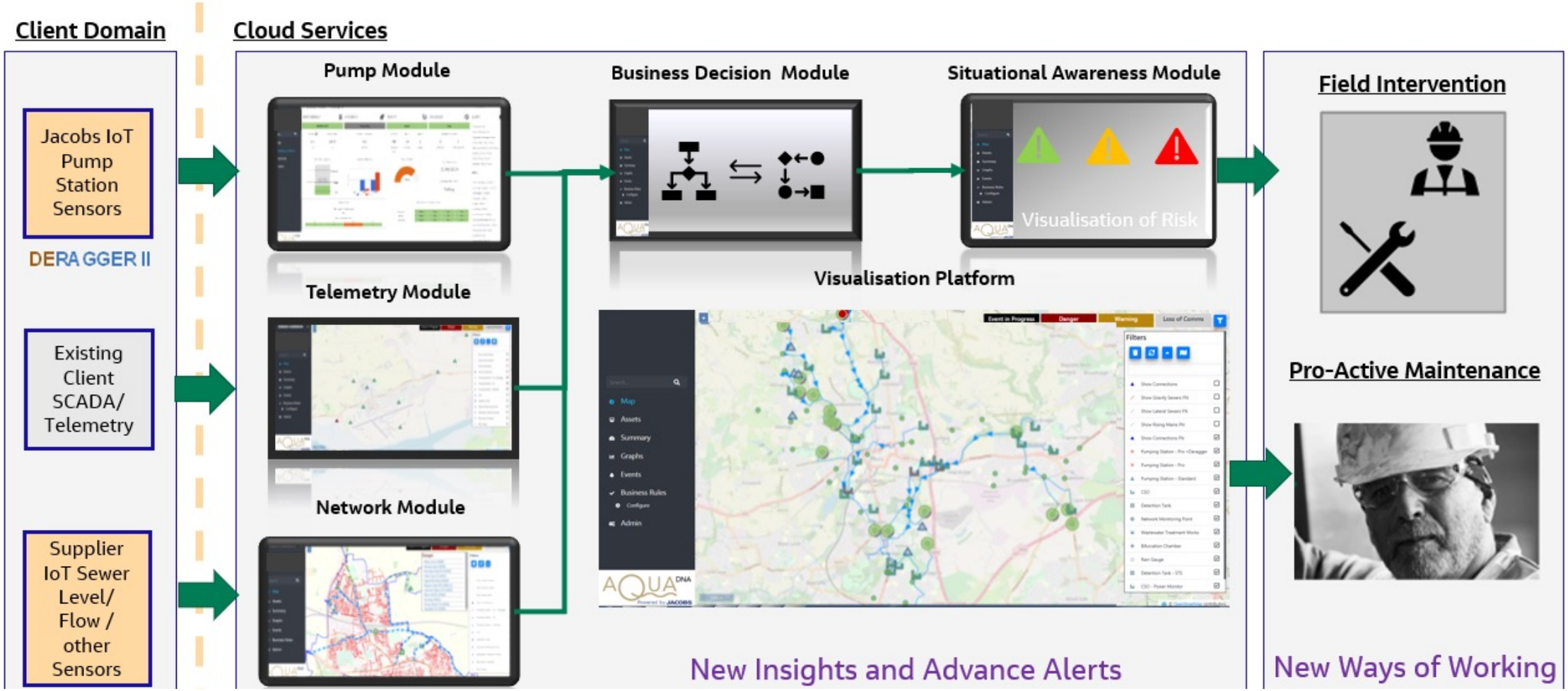
# United Utilities Wastewater Dynamic Network Model



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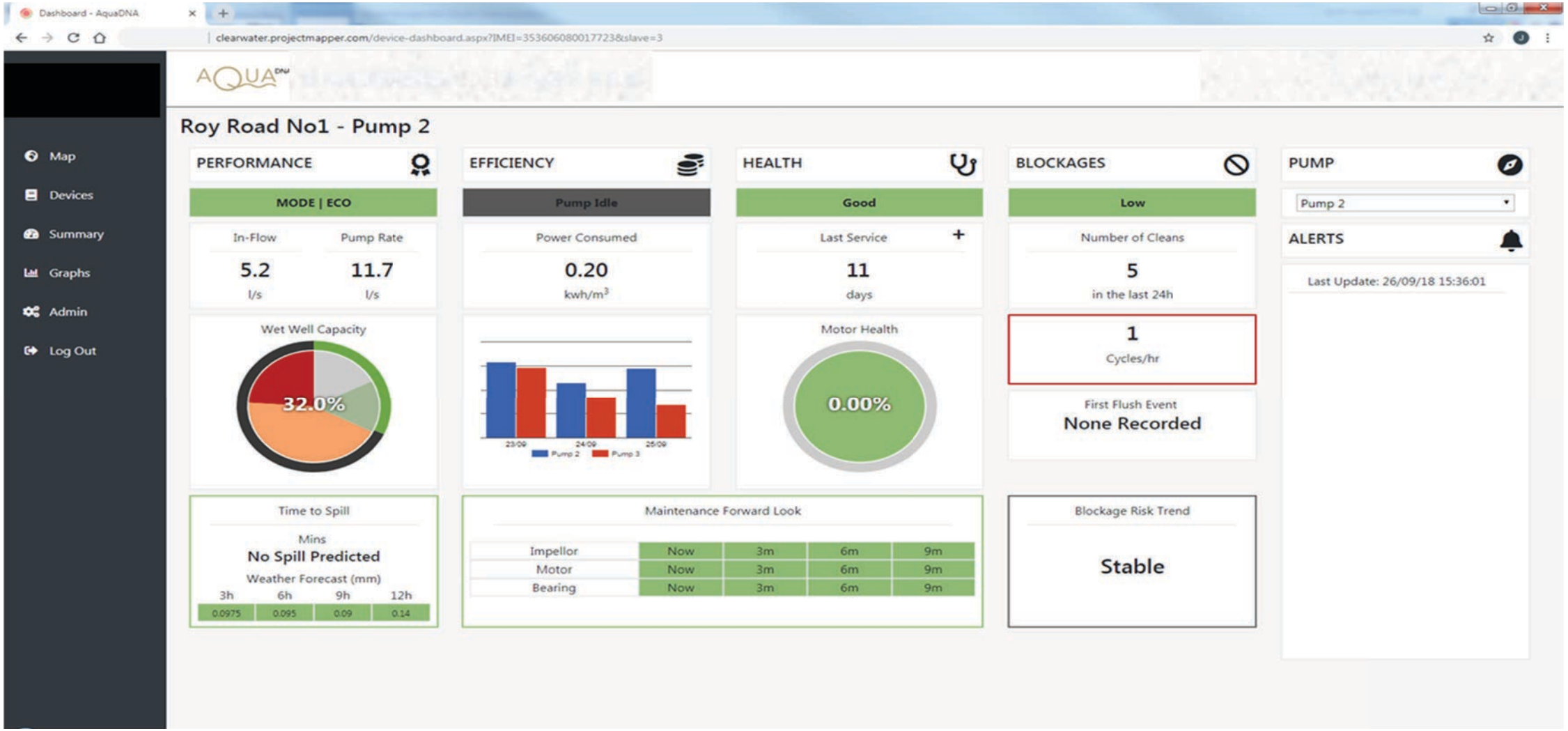
# Real time Pump Station Optimization



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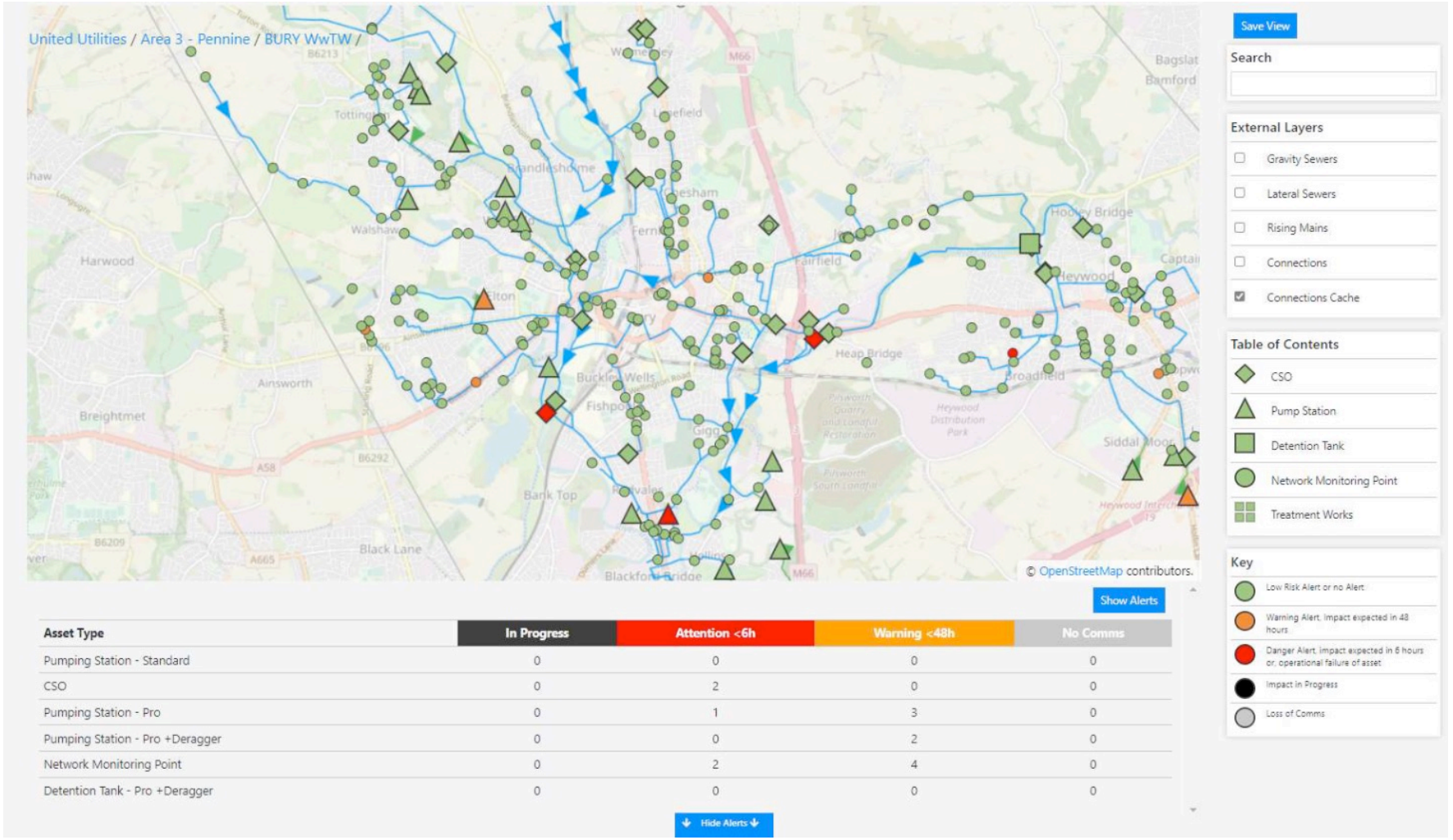
# Provides Real-time Situation Awareness




| Asset Type | In Progress | Attention <6h | Warning <48h | No Comms |
|---|---|---|---|---|
| Pumping Station - Standard | 0 | 0 | 0 | 0 |
| CSO | 0 | 2 | 0 | 0 |
| Pumping Station - Pro | 0 | 1 | 3 | 0 |
| Pumping Station - Pro +Deragger | 0 | 0 | 2 | 0 |
| Network Monitoring Point | 0 | 2 | 4 | 0 |
| Detention Tank - Pro +Deragger | 0 | 0 | 0 | 0 |



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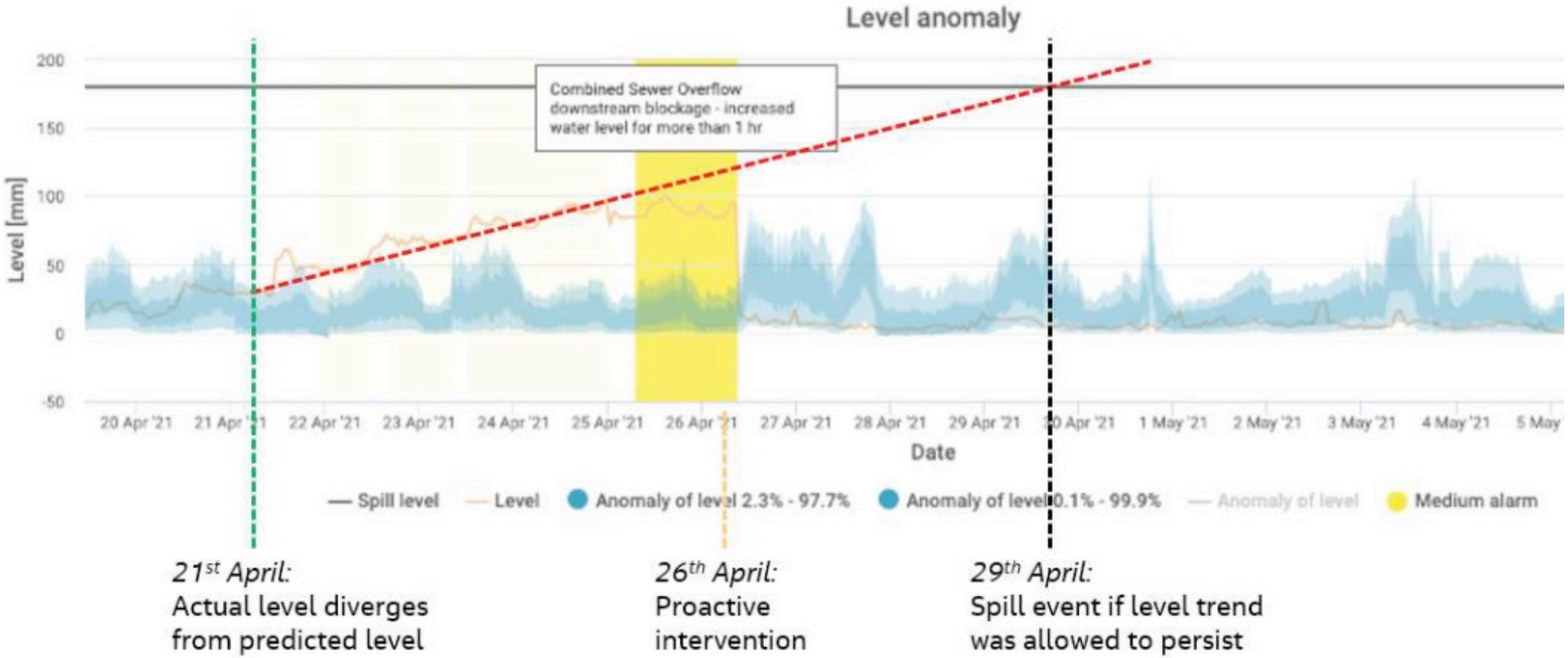
# Predictive Analysis Provides Insights for Proactive Action




*21st April:*
Actual level diverges from predicted level

*26th April:*
Proactive intervention

*29th April:*
Spill event if level trend was allowed to persist

Over 400 events detected and proactively responded to in 2020-2021



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# Summary



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# Lessons Learn

Smart Water Systems are not simply a technology solution – It requires integration of Workforce (People) – Governance (Procedures) – Technology

Strategic planning is the first step towards implementing a successful program

Creating a Smart Water Program is a journey that must create value for the organization. Understanding the greatest challenges and prioritization is essential.

Learn from what others in the industry or other sectors have done to create reinventing the wheel

Industry organizations, like SWAN, provide opportunities for collaboration with utility colleagues.



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# Q&A



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