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

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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?
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
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

90% Optimize Operations

97% Predict System Failure

Yes  No
Real-time Dashboard
How does a utility get started?
Characteristics of a Smart Water Utility

- Strategy & Vision
- Workforce
- Asset Management
- Data Management
- Integration & Interoperability
- Analytics & Information Use

Risk & Resiliency
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

- **Level 0: Ad Hoc**
  Data are collected manually as needed.

- **Level 1: Manual**
  Data sources may exist, with data collected and stored. Collection may not be continuous.

- **Level 2: As-needed**
  The right data are collected to support information creation. Data sources are confirmed or calibrated to check quality.

- **Level 3: Timely**
  Data are collected and communicated in a timely manner. Data quality is monitored and managed.

- **Level 4: Unique**
  Redundant data sources are eliminated so that only data that have a use are collected. Each data source is a single source of truth.

- **Level 5: Reliable**
  Data are validated, verified, and available, and considered highly reliable for making sound business decisions.
Consolidated Results
What can success look like?
United Utilities Wastewater Dynamic Network Model

Client Domain

- Jacobs IoT
- Pump Station Sensors
- DERAGGER II
- Existing Client SCADA/Telemetry
- Supplier IoT Sewer Level/Flow/other Sensors

Cloud Services

- Pump Module
- Telemetry Module
- Network Module

Business Decision Module

Situational Awareness Module

Field Intervention

- Visualisation of Risk

Pro-Active Maintenance

New Insights and Advance Alerts

New Ways of Working
Real time Pump Station Optimization
Provides Real-time Situation Awareness
Predictive Analysis Provides Insights for Proactive Action

Over 400 events detected and proactively responded to in 2020-2021
Summary
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.
Q&A