### SWAN Digital Twin Workgroup Objectives

#### Holistic Architecture Subgroup
- Architecture
  - Building blocks and interfaces needed for a high-performance DT
  - Must fulfill needs and outcomes

#### Digital Twin Lifecycle
- Understand the needs of the different DT actors/phases:
  - Design
  - Construction
  - Operation
  - Customer

#### Outcomes and ROI
- Outcome & ROI
  - Benefits of using DT in real applications
  - Tabulate actual ROIs from case studies for reference

#### Identify Key Challenges for Utilities

#### Collectively Develop Best Practices

#### Increase the Adoption Rate of Digital Twins

#### Asset Data and BIM

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**DT lifecycle**
Understand the needs of the different DT actors/phases:
Holistic Digital Twin Technology Architecture

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Holistic Digital Twin Technology Architecture

OBJECTIVES

• Define the core technology components of a digital twin
• Identify best practices steps in digital twin technology approaches
  • useful data sets for both the input parameters, as well as the calibration of the model
  • areas for integration with existing systems, i.e: SCADA, CMMS, GIS, work-order, CIS, etc.
  • key interfaces between the sub-systems
  • need for middleware/glue-code in the development of a digital twin
  • commonalities and differences with models for 1) DW, 2) WW, 3) Storm Water, 4) Source Water
• Develop a high-level architectural diagram
• Coordinate and collaborate with other digital twin subgroups
Digital Twin
A reference architecture for the water and wastewater industry
Digital Twin Outcomes and Applications Subgroup

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Interested? Sign-up for this subgroup on the SWAN website and reach out to subgroup co-chairs.
Outcomes and Applications Subgroup Objectives

Undertaking a Digital Twin initiative without specific application goals and required outcomes can quickly become an organizational quagmire...

OBJECTIVES

• Identify the most common desired outcomes that drive digital twin adoption
• Discover and share best practices for organizational stakeholder engagement in goal setting/outcome metrics
• Point to real-world experiences in organizations who have achieved outcomes and identifiable ROI
• Identify the different users of digital twin and those user’s interface for benefitting from the digital twin
Outcomes and Applications Subgroup – Submit your story!

A brief survey form to collect basic information about Digital Twin implementations

Public Survey Link is now live:
https://forms.gle/oM2sj5JKcMNoJuUD9
Digital Twin Profile: Aegea (São Paulo, Brazil)

Problems to Be Solved
- Ageing Infrastructure
- Regulatory Compliance
- Water Loss
- Data Management
- Design Optimization
- Construction Efficiency

Benefits Achieved from Digital Twin
- Energy savings: 18%
- Maintenance cost savings: 23%
- Increased operational efficiency
- Enhanced work order prioritization
- Management of risks associated with asset failures (reputation, compliance, and social impact)
Digital Twin Profile: Scottish Canals

Problems to Be Solved
• Ageing Infrastructure
• Navigation Protection
• Flood Risk

Digital Twin Key Features
• Real-time forecasting of levels
• Scenario simulation of sluice settings
• Real-time control of sluice gates

Benefits Achieved from Digital Twin
• Flood protection of 110 Hectares of development land ~50M GBP
• Annual navigation income ~100k GBP
• Increased operational efficiency
• Management of risks associated with asset failures (reputation and social impact, tourism)
NEW Digital Twin Lifecycle Subgroup

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NEW Digital Twin Lifecycle Subgroup

OBJECTIVES

• Develop education on concepts and examples of digital twins to bring the best operational experiences to all asset phases
• Create a diagram demonstrating digital twin types and levels throughout a full asset lifecycle
• Gather and share case studies within each area of an asset lifecycle
• Coordinate and collaborate with other digital twin subgroups