

SWAN Digital Twin Workgroup Objectives

Raise Awareness of Digital Twin Concepts

Identify Key Challenges for Utilities

Collectively Develop Best Practices

Increase the Adoption Rate of Digital Twins

Asset Data and BIM

Holistic Architecture Subgroup

Architecture

- ✓ Building blocks and interfaces needed for a high-performance DT
- ✓ Must fulfill needs and outcomes

DT lifecycle

Understand the needs of the different DT actors/phases:

- Design
- Construction
- Operation
- Customer

Digital Twin Lifecycle

Outcomes and ROI

Outcome & ROI

- ✓ Benefits of using DT in real applications
- ✓ Tabulate actual ROIs from case studies for reference

Holistic Digital Twin Technology Architecture



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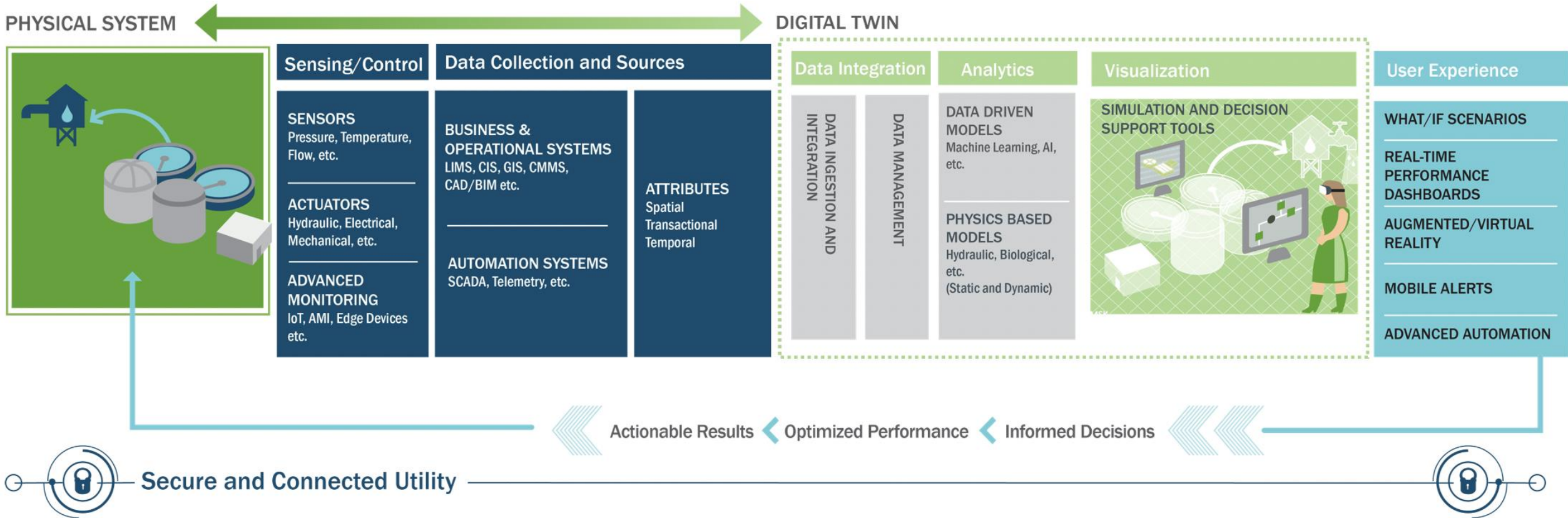
Holistic Digital Twin Technology Architecture

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/oM2sj5JKeMNoJuUD9>



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