

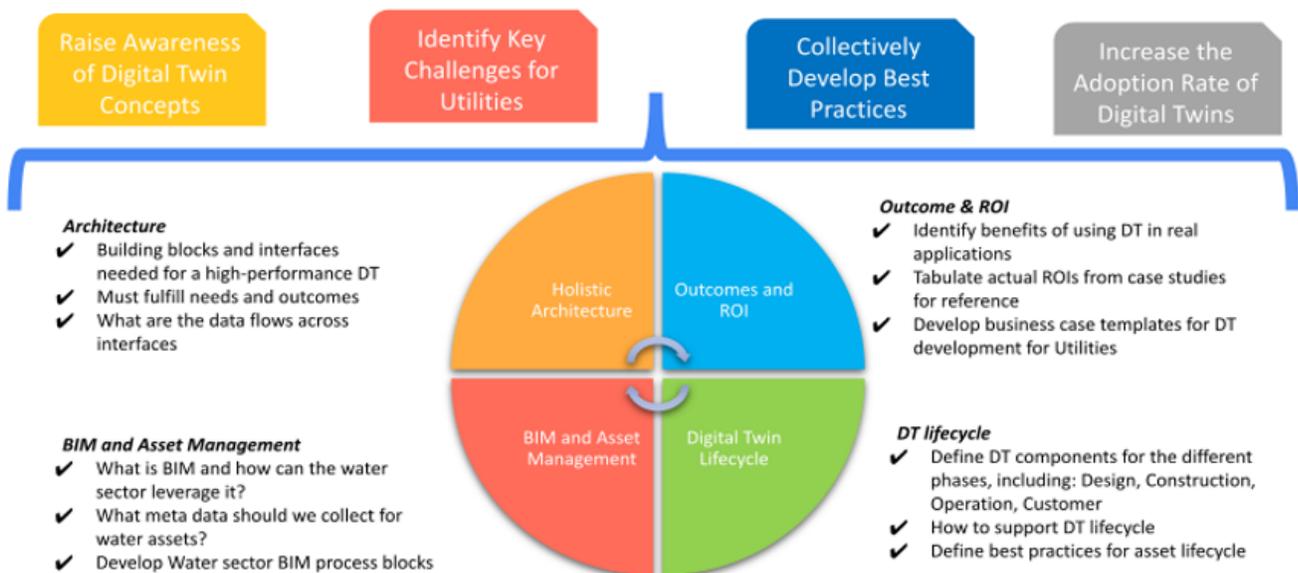
SWAN Digital Twin Work Group

GOAL

To develop a common strategy for developing Digital Twin technology for global water utilities, providing a means for managing operations and assets in real-time for greater operational efficiency, enhanced lifecycle asset management, and reduced costs.

OBJECTIVES

- ✓ Identify key challenges for utilities utilising an operational hydraulic model
- ✓ Identify key challenges with data accuracy and normalisation across multiple systems
- ✓ Develop a holistic view of a water system via the culmination of digital solutions: IoT, VR/AR, mobility, machine learning, cloud computing, drones, etc.
- ✓ Identify and develop best practices for hydraulic model calibration, including utilisation of real-time data from consumption meters, GIS, SCADA, CMMS, and other IoT sensors
- ✓ Identify and develop best practices for aggregating digital twin subsystems (i.e. a pump digital twin) and for utilising machine learning to help accurately model the water system
- ✓ Develop best practices for accessing data from the various silos of systems, applications, and IoT
- ✓ Develop best practices for application integration and application mobility, as well as the collaboration of IT and OT in utilities



JOIN A SUBGROUP

We welcome all SWAN Members to collaborate and contribute their knowledge by volunteering in one of the four subgroups, outlined below. We plan to have around four meetings a year, as well as plan for two in-person meetings a year in the form of a workshop or work session.

(1) Holistic Digital Twin Technology Architecture Subgroup – *Led by Michael Karl, National Smart Utility Technology Manager (Brown and Caldwell) & Chengzi Chew, Business Development Manager – Emerging Technology (DHI)*

Objectives:

- Define the core technology components of a digital twin
- Identify best practices for migrating an existing batch-mode hydraulic/other model to a continuous-mode model
- Identify useful data sets for both the input parameters and calibration of model
- Identify areas for integration with existing systems, i.e. SCADA, CMMS, GIS, etc.
- Identify and define key interfaces between the sub-systems
- Identify if there is a need for middleware/glue-code in the development of a digital twin, if so outline best practices
- Find commonalities and differences with models for 1) DW, 2) WW, 3) Storm Water, 4) Source Water
- Develop a high-level architectural diagram

(2) Outcomes & Applications Subgroup – *Led by Andrew Smith (Smart Water Strategy Manager - Anglian Water) & Pedro Vieira (Innovation Director - Águas do Porto)*

Objectives:

- Identify the most common desired outcomes that drive digital twin adoption, creation, usage – answering the question of “Why implement a digital twin?”
- Share best practices for organisational stakeholder engagement (operations, engineering, management, etc.) in setting goals and outcomes of digital twin implementation
- Rationalise “effort vs. ROI” around the creation and usage of a digital twin, pointing to real-world experiences from organisations who can share outlines of the required effort
- Identify the different users of digital twin for the range of outcomes (i.e customer experience dept. vs. operational, vs. business and revenue, etc.)
- Identify the UI for retrieving an outcome - answering the question “What will the operation staff see vs. what will the other users use for obtaining that outcome?”

(3) Digital Twin Lifecycle Subgroup (Design – Construction – Operation – Customer) –

Led by Agnethe Pedersen, Industrial PhD Student (VandCenter Syd) & Youri Amerlinck, Researcher (Aquafin NV)

Objectives:

- Develop educational concepts and examples of digital twins to bring the best operational experiences to all phases of an asset
- 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

(4) BIM & Asset Management Subgroup – Led by Jamie Mills, Global BIM Manager (Xylem) & Christopher Steele, Head of Digital Products and Services (Binnies)

Objectives:

- Build upon and adopt existing work undertaken by BIM4Water
- Provide a standardised process for implementing a digital twin within the asset lifecycle using applicable industry standards and best practice, learning from complimentary SWAN workstreams and practical project delivery

If you are interested in joining the Work Group as an “Active” or “Observer” Member, please reach out to Shayna Ramboz - shayna@swan-forum.com