



## SWAN Digital Twin Work Group: Holistic Architecture Subgroup

### SWAN Reference Architecture

Michael Karl (Brown & Caldwell) reviewed the subgroup's current goal of building upon the [SWAN Digital Twin Architecture](#) and focusing on the purposes it was created for:

- Developing a common language
- Aligning the water industry ecosystem
- Answering common questions, i.e. what does my utility need a digital twin? how does one start the process and apply the architecture?

### Case Study Presentations

Andreu Fargas (Tarragona Water Consortium), Pilar Conejos (Idrica), and Giulia Buffi (Romagna Acque) shared a high-level overview of their submitted case studies - full case study recordings can be found [HERE](#).

1. Andreu Fargas: Tarragona implemented a digital twin tool - Suez Aquadvanced Energy - to optimise energy use and create automated operations as a way to reduce the expensive cost of water distribution to a population of ~700,000.
2. Pilar Conejos: Idrica implemented the GoAigua Digital Twin to enhance their daily operations/planning for distributing water to a network of 1.7M. It has helped to minimise risks and to assess future infrastructural needs.
3. Giulia Buffi: Romagna implemented the Mike Urban + and Water Net Advisor to capture insights in their water network - hindcast, real-time, and forecast.

### Open Discussion

1. How have operations and leadership adopted the digital twin?
  - a. Andreu Fargas: There are mixed responses from both operations and leadership. While some operators see it as an interference with their current processes, others are too confident in the digital twin and neglect to monitor. It's important

the leadership understands that the instructions/expectations given to the machine for optimisation will be different from those for manual operation.

- b. Pilar Conejos: There was early acceptance by operators and leadership as the benefits were clearly seen, i.e. more secure business decisions; extra data creates further opportunities; easily transferred knowledge from retired workforce to new operators.
  - c. Giulia Buffi: Along the same lines, the operators understood the benefits and the leadership trusted the technician's advice to implement a digital twin.
2. What advice would you give a utility looking to justify a digital twin journey to leadership?
- a. Clearly lay out the goals, desired outcomes, and expectations for the digital twin while keeping it as a simple foundation to be built upon.
3. How do you measure success and handle changing goals?
- a. The best way to measure success varies greatly depending on the tangibility of the goals. However, it's always essential to establish a solid basis at the beginning to make sure the capabilities can be adjusted as the objectives change.