2nd SWAN Digital Twin H2O Workshop Takeaways

November 6th, 2019, Aquatech Amsterdam 2019

Panel: Progressive Utility and Industry Leaders' Approach to Implementing Digital Twin Solutions

Moderator: Gigi Karmous-Edwards**,** President (Karmous-Edwards Consulting)

- Cecil McMaster, CIO (NYC Department of Environmental Protection)
  - NYC environmental agency
  - Many responsibilities and LOTS of assets – 99% of water moved with gravity
  - Been on a digital journey for the past 15 years, most systems are digital without knowing it – it's only recently (last 15 years) that data knowledge is being shared and plans have been optimized
  - Many plans are built to last 30 years, need to invest in people as well for future generations by focusing on outcomes.
- Andreu Fargas-Marques, Maintenance Department Chief (Consorci d'Aigües de Tarragona)
  - *Siloed technologies so need collaboration, each tech couldn't do everything and so it can be improved*
  - *Pilot phase now, connecting RTD to the model, connecting SCADA with everything else*
  - *Digital twin is a long journey – next step is to validate data, define expected outcomes, verify sensors etc.*
- Andy Smith, Smart Water Strategy Manager (Anglian Water)
  - *Focusing on people aspect – digital transformation group within the utility*
  - *Understanding 'source to tap' to create a vision and roadmap – showing the business cases and future initiatives*
  - *They need to communicate a clear definition and purpose 'integrated accurate digital representations of assets, systems etc.*
  - *'what does a digital twin do for me?' – proof of concept. Focusing on leakage, location, burst prediction, minimizing customer impact, optimization of process, balancing power, quality*
- David Fortune, Director of Innovation (Innovyze)
  - Hierarchy of digital twins and the different types of models and for different purposes e.g. for network operations
  - Outlined various case studies e.g. Scottish Canals, Bristol Water
  - Lessons learned
- Pablo Calabuig, CEO North America (GoAigua)
- Pilar Conejos, VP Network Operations (Global Omnium)
  - Main insights – how it's used, what it's a result of / ongoing transformation that needs to be fully connected
  - What a digital twin is – can monitor, analyze, simulate etc.
  - Needs to be constantly paired with real data and calibrated/validated to behave like the real system
  - Case study in Valencia: define scope and objectives, asses starting points, foster collaboration and innovative culture, develop analytical capabilities and uses cases
  - Main objectives defined early but included long term planning and operational support

Interactive Roundtable Discussion: Holistic Architecture subgroup: *What are best approaches and technology roadmaps for creating a useful, scalable, and high-performance Digital Twin?*

- **Roundtable 1: Global Efforts on Digital Twin Architecture – Data Centric**
- Joep van den Broeke, Senior Scientific Researcher (KWR Water)
- Eric Dorgelo, CTO (Aquatic Informatics)
    - *process and performance of digital twin was the focus of the discussion*
    - *discussed how these work together for wastewater treatment plant*
    - *need to be pragmatic in approach, and be outcomes driven*
    - *outcome → holistic approach to make performance*
    - *unlikely that it would be implemented by one vendor – many systems working together, sharing data to get outcomes*
- **Roundtable 2: Digital Twin for Storm Water at VCS, Denmark**
- Agnethe Nedergaard Pedersen, Industrial PhD Student (VCS Demark)
- Ido Blank, VP Sales (Kando)
    - *Models vs. Data driven approach*
    - *Combine them for different purposes, quality of data and what raw data looks like*
    - *Look at abnormalities in data to see optimum solutions (by identifying any inefficiencies)*
    - *Data from everywhere that must be connected*
- **Roundtable 3: BIM for Digital Twin, Starting from Optimization of Designs**
    - Stewart Macfarlane, Regional Director (Ecodomus)
        - *BIM – true value when it's the cost*
        - *Utilities may not have used BIM, but lots of siloed data*
        - *BIM can integrate the data into one platform to aggregate data to better utilize it, if it's in one place it helps you to see the bigger picture*
        - *It's an integration of systems*
        - *Emerging opportunity for digital twin – utilities have a hard time managing because data was 'everywhere and nowhere' – shows bigger need for lifecycle management – risks include the size of the challenge – managing asset data and also hard changing the mindset and challenges re: security*
- **Roundtable 4: Case Study Consorci d'Aigües de Tarragona**
- Tim Braun, Senior VP and Enterprise Architect (Xylem)
- Andreu Fargas-Marques, Maintenance Department Chief (Consorci d'Aigües de Tarragona)
    - *Defining objective of Digital Twin critical. Once it's defined one needs to see where the data is, who owns it and how it's organized so that it can be utilized by everyone*
    - *Does data or model come first? They like the hybrid approach, using them collaboratively*
    - *Digital twin approach isn't perfect, but there's incremental improvements*
    - *People may not get it - you need the right people to be involved and collaborate with – they need to be lifted and enthusiastic.*

Interactive Roundtable Discussion: Outcomes and Return on Investment Subgroup: *How can we prioritize outcomes to navigate options and deliver tangible benefits for Digital Twins?*

- **Roundtable 5: Outcomes from Digital Twin in Valencia**
- Pilar Conejos, VP Network Operations (Global Omnium)
- Pablo Calabuig, CEO North America (GoAigua)
    - *Digital twin needs to be connected real-time to operations*
    - *Use cases: common for planning, evaluating, estimating points for the operations department. Some less common cases: for networks in the next 24 hours looking at future networks and water quality.*

- *You need organizations, operation team on board, support from smart meters etc. to make the digital twin work*
- *Good relationships are needed with universities* and full eco-systems

- **Roundtable 6: Anglian Water Case Study**
- Mark Kaney, Director of Asset Management (Black & Veatch)
- Andy Smith, Smart Water Strategy Manager (Anglian Water)
  - *Asset lifecycle: create, operate, maintain, plan, disposal*
  - *Running scenarios before construction – money saved, improved safety and ability to do digital rehearsal before commission.*
  - *Holistic scenario plan – knowledge sharing, more reliance on data, less on people's personal knowledge*
  - *Focusing on customer outcomes*
  - *Which parts of the model are critical for maintaining – applying this across assets- working safely and proactively and efficiently?*
  - *How plan and dispose – how assets are used and repurposed.*
  - *Data shared across everyone with an ability to invest*
- **Roundtable 7: Case Study of Thames Storm Water Digital twin**
- David Fortune, Director of Innovation (Innovyze)
- TBD, Thames Water
  - *Digital twin most effective when there's a justifiable purpose with a return on investment – this doesn't need to be monetary, can be environmental or health and safety benefits – it's important not to be generic in how it can be used*
  - *Important to include the end users (operations) from the beginning, so that it can be used by them easily and effectively*
  - *Having a purpose drives the type of model, data and the maintenance of those. There can still be growth and future development*
  - *Digital twin is for life - not just for Christmas – so plan and do maintenance and upkeep right from the start*
  - *Next steps: collecting needs, pains, what keeps utilities up at night – then formulate a plan and a 'single purpose' where the digital twin can help*

Sponsored by