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From data to impact:

Perspectives on intelligent water infrastructure

Insights from the AU water summit roundtable workshop

Supported by SWAN Forum

The water sector is entering a pivotal moment

Across utilities, engineering firms, and technology providers, leaders are grappling with intensifying pressures from aging infrastructure and climate volatility to workforce transitions and mounting operational risk. At the same time, rapid advances in cloud computing, AI, modeling, and digital twins are unlocking capabilities that were unthinkable just a decade ago.

At Autodesk University 2025 Water Summit, industry experts gathered around eight collaborative roundtables to discuss one defining question: **How do we turn data into impact?**

Participants represented diverse organizations, expertise areas, and operational contexts. The hosts at each roundtable were representatives from SWAN, Black & Veatch, Kimley Horn, HDR, VAPAR, Transcend, SUEZ Optimatics, Esri, and Stantec.

This report captures the collective themes, insights, and recommendations that emerged across all roundtables, followed by concise summaries of each table's contribution.

Summary: a sector ready for transformation

If one message resonated above all others, it is that the future of water infrastructure will be data-driven, predictive, integrated, and collaborative—and the sector is ready for change. **Across the eight roundtables, participants consistently identified five cross-cutting themes:**

01

Data exists in abundance—but not in unity
Utilities and engineering firms continue to struggle with siloed systems, inconsistent metadata, and unclear ownership. As Esri's roundtable participants noted, "Inclusive standards are the only way forward."

02

Digital maturity varies widely across utilities creating uneven readiness for transformation
While some organizations are advancing quickly with cloud platforms, AI pilots, and early-stage digital twins, others are still developing foundational capabilities, such as data governance, metadata standards, cybersecurity protocols, and basic system integration. This uneven digital readiness often becomes a barrier to scaling innovation: technology is available, but processes, skills, and organizational alignment are not yet in place. Several roundtables noted that even within a single utility, maturity can differ across departments, making it difficult to prioritize investments, coordinate workflows, or define unified digital strategies. As participants at the HDR roundtable summarized, "Our clients are at very different levels of digital maturity, and that shapes what's possible."

03

Human factors overshadow technical barriers
Resistance to change, uncertainty over shifting roles, and fear of losing institutional knowledge create friction. Participants agreed that digital transformation is fundamentally a people transformation.

04

ROI must be framed in operational terms that utilities understand
Utilities often struggle with ROI when it's expressed only in abstract terms. Framing it in operational terms—such as reduced outages, deferred capital spend, improved crew productivity, or shorter response time—connects investment decisions directly to day-to-day utility performance and service reliability.

05

Intelligent water systems are a long-term journey
Digital twins, cloud workflows, and AI are not one-off deployments—they require iterative scaling, governance, maintenance, and a commitment to continuous learning.

A sector confronting complex challenges

Across all roundtables, participants identified a common set of challenges that slow progress toward intelligent infrastructure:

01

Fragmented data & disconnected systems

Utilities often manage data in spreadsheets, legacy databases, SCADA silos, GIS layers, and departmental archives. Esri's roundtable participants noted that even when data is available, teams often only see fragments of the full picture, limiting coordination between operations, engineering, and planning.

02

Cultural barriers & workforce dynamics

Participants at the Kimley Horn and Stantec roundtables. emphasized that digital work fundamentally reshapes roles and deliverables, from CAD to BIM, from paper to digital workflows, and from experience-based decisions to data-driven ones. Resistance is natural, making communication and training essential.

03

Cost pressures & budget constraints

Cloud computing, cybersecurity compliance, training, and new analytics platforms are powerful but expensive. SUEZ Optimatics's roundtable participants flagged the challenge of cloud and licensing costs increasing at different rates, while those at Stantec's table noted that the most difficult part of securing funding is clearly communicating the "why."

04

Ambiguous terminology & misaligned expectations

Participants at SWAN/Black & Veatch roundtable acknowledged that part of the challenge lies in inconsistent terminology and varied interpretations of what a "digital twin" actually is. Despite this, it was agreed that digital twins represent the future of how infrastructure will bemanaged. The question is not whether to pursue digital twins, but which problems require them, and at what level of complexity.

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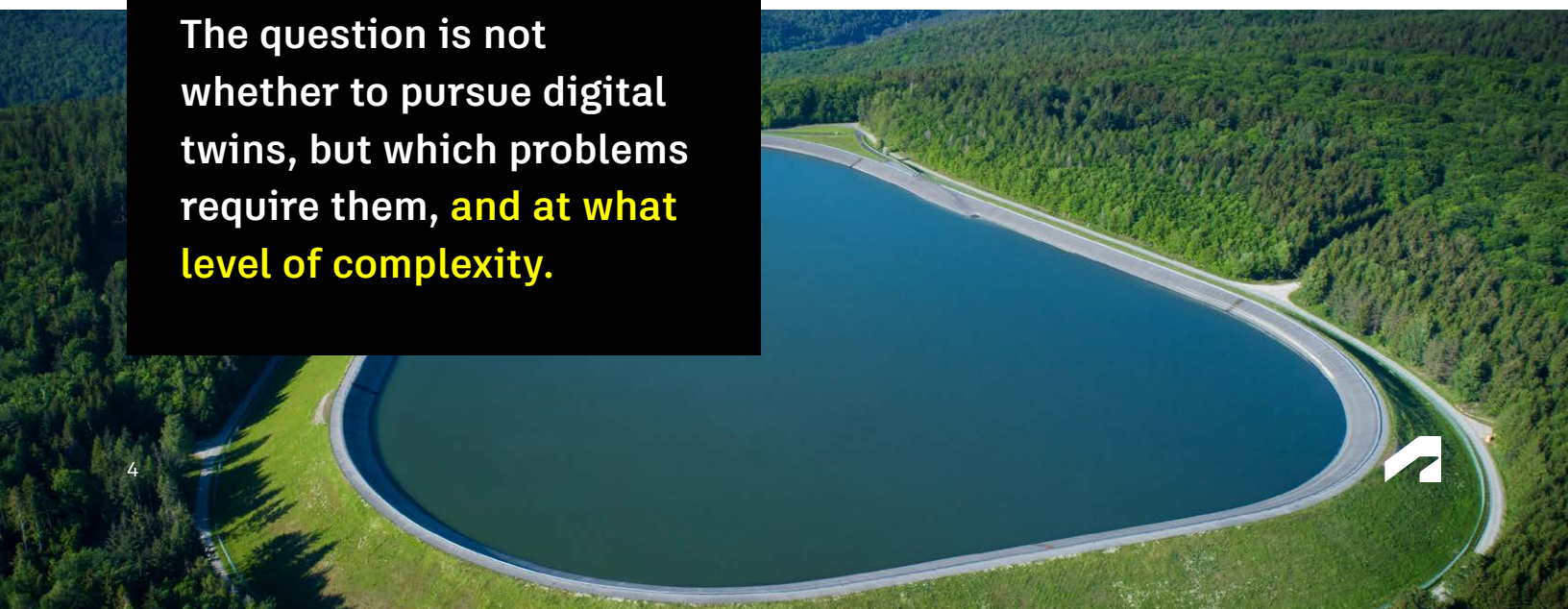

The transformational value of intelligent water systems

Digital transformation is redefining how the water sector plans, operates, and manages critical infrastructure. Despite challenges in cybersecurity, data governance, and organizational readiness, participants described a sector steadily shifting toward intelligent, proactive, and collaborative systems.

From reactive to proactive operations
Predictive analytics, real-time monitoring, and condition assessment are becoming the backbone of resilience. Utilities are beginning to anticipate failures, extend asset life, and reduce unplanned disruptions.

Doing more with less
Regulatory pressure and limited budgets are accelerating the need to optimize resources, workforce, and technology. Cloud platforms upgrade outdated tools, AI accelerates analysis, and integrated datasets reduce duplication. Engineering and consulting firms emphasized the need to demonstrate ROI early and to collaborate closely with utilities.

Better planning and prioritization
Improvements in data quality shift asset renewal from age-based assumptions to risk- and performance-based decisions, as noted by VAPAR's roundtable participants.

Collaboration as a force multiplier
Digitalization is strengthening alignment across engineering firms, operators, planners, and managers. With the proper security protocols in place, shared platforms improve transparency and unite teams around common goals.

Operational resilience and knowledge retention
Predictive tools and standardized data models preserve institutional knowledge as workforces change. Digital processes support continuity, accuracy, and safer, more efficient operations—augmenting rather than replacing human expertise.

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Human factors overshadow technical barriers—resistance to change, uncertainty over shifting roles, and fear of losing institutional knowledge create friction. Participants agreed that **digital transformation is fundamentally a people transformation.**

Considerations for the journey ahead

Cybersecurity becomes foundational
Cloud and AI adoption require well-defined compliance strategies. SUEZ Optimatics's roundtable participants highlighted transitional hybrid "on-prem cloud" approaches to balance scalability and security.

Avoiding fragmented technology ecosystems
Participants at SWAN/Black & Veatch roundtable emphasized the importance of digital governance to align the objectives of multiple systems, rather than creating silos or conflicting priorities.

Evolving contracts and deliverables
Kimley Horn's roundtable participants highlighted the need to modernize expectations around BIM, data deliverables, and digital workflows to support new ways of working.

Data governance first
Utilities should build on existing best practices for metadata standards, data quality, access, and security before scaling AI or digital twin initiatives. Industry forums and associations have a role to play in supporting utilities on this journey, fostering collaboration and shared learning.

Strategies to accelerate digital transformation

The roundtables also reinforced several key strategies for accelerating digital transformation and advancing digital maturity:

- **Start small and scale** the strongest successes began with a narrowly defined problem.
- **Continuously build trust** through calibration and transparency.
- **Align teams through communication** and early cross-stakeholder and operational user engagement – engineering firms stressed early and continuous engagement.
- **Developing interoperability standards** requires consistent schemas and clear definitions of what is shareable versus what must remain secure.
- **Investing in workforce development introduces** a powerful framework: engineering management, project management, and technology leadership form the "three-legged stool" of digital transformation.
- **Identifying champions and developing clear** roadmaps are essential for long-term adoption and scalability.

APPENDIX

Autodesk & Swan: advancing smart water together

Autodesk is proud to be a member of the SWAN Forum, partnering across global events, workshops, and innovation initiatives to help utilities across all maturities advance digital transformation. The workshop at the Water Summit at AU 2025 was co-led with SWAN as part of a shared commitment to support water organizations worldwide in building resilient, intelligent, future-ready infrastructure.

Roundtable hosts & organizations

Optimatics a SUEZ company

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HDR

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