



# AUGMENTED (DIGITAL) INTELLIGENCE PEOPLE, THE MISSING DIMENSION IN

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The digital transformation trend has accelerated over the past twelve months as the public and private sectors come to realize that analog solutions to managing water, from the river basin to manufacturing, or from treatment to the tap, are difficult if not impossible when much of the workforce has moved to remote working. However, the key challenges to accelerating this transformation are competition with the status quo and the need for investment in the workforce tasked with this digital transformation.

While for convenience we refer to the "water sector," we have a more expansive view of how digital technologies are transforming water in general.

This means humanity's relationship with water to include the opportunities for digital water technologies in homes (e.g., Rachio and spout), empowering citizen scientists (e.g., several of Microsoft's AI for Earth companies), alternative hydration (e.g., Flowater) and increasing education and awareness of water challenges and opportunities (e.g., Project WET).

### **The Fourth Industrial Revolution**

The World Economic Forum was one of the early organizations that focused on the role of digital technologies in transforming the water sector as framed as the Fourth Industrial Revolution. This early report documented

the opportunities in deploying digital technologies to more efficiently and effectively manage water. It also identified many of the challenges in adopting digital technologies for water utilities and industrial sectors such as food and beverage. An in-depth look at the opportunities and challenges within the water and wastewater sectors was commissioned by the International Water Association (IWA) and Xylem.

The conclusions regarding how to succeed with a digital transformation strategy from the IWA - Xylem report include set ambition at the c-suite and board level, define a clear business strategy, build an innovation culture, leverage pilots for an agile mindset, de-



The digital transformation of the water sector, both the utility and industrial sectors, was well underway before the pandemic.

## DIGITAL TRANSFORMATION OF WATER

velop architecture for optimizing data use, cultivate your digital ecosystem, embrace the digital water value case and unite around solving key barriers (e.g., cybersecurity, interoperability, regulations and culture).

### Digital Transformation

While we are all, hopefully, learning about the opportunities and challenges in the digital transformation of the water sector, there is a cautionary perspective. This has to do with focusing on the human capital dimension of digital technologies. More on this dynamic can be read in the book *The Technology Fallacy: How people are the real key to digital transformation*.

This transformation is only possible when people are empowered and equipped to make it so. In our view, the most appropriate way to think about the role of digital water technology is as “augmented intelligence” providing the human workforce with more powerful tools.

A few observations on digital technologies from *The Technology Fallacy* illustrate our point of view:

- ★ Many of the cultural, organizational, strategic, leadership, and talent responses are far more important and far more difficult than the technological ones.
- ★ Research shows that respondents prefer to work for a digital leader and attract digital talent.

- ★ Conversely, a lack of digital maturity may increase attrition.

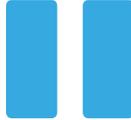
- ★ Organizations identify and assimilate innovations at different rates – it is a learned capability over time. Companies learn by doing it.

- ★ Increase “sensing systems” to acquire information from outside the organization

**The World Economic Forum was one of the early organizations focused on the role of digital technologies in transforming the water sector**



# In the water industry, AI and other digital technologies should be reframed as Augmented Intelligence rather than Artificial Intelligence



★ Increase the velocity of internal information flows (e.g., collaboration tools)

## What does all of this mean for the water sector, and in particular, the water and wastewater utility sector?

In general, with a few notable exceptions, the management of many water utilities see digital water as a way to cut costs, and the workforce see this as a threat. Both are wrong. Digital water is not a way to cut costs; it's a way to add value. Yes, that means reducing costs, but that doesn't necessarily mean workforce reduction. We should be looking at upskilling the workforce and presenting these digital tools as just that, digital tools. These tools should free up labour so workforce time can be refocused. Utility leadership needs to recognize the value of using digital tools to augment the existing workforce, and the workforce needs to be receptive to developing the skills and learning to use this new technology to its full potential.

Water customers of utilities don't mind if their networks are managed by

autonomous artificial intelligence (AI) systems as long as there is some human oversight, but perhaps they are not so keen on being dealt with by a chatbot or treated as human data by a clever algorithm.

Digital systems can do lots of things that humans cannot. For example, they can work 24 hours a day every day. But they aren't so good at customer service, intuition and strategic thinking - they don't have emotional intelligence (EQ). The digital water revolution is providing water companies with systems that can do things that humans can't, so the water companies should be combining the human and the digital not looking to replace one with the other. Why on earth are chatbots some of the first digital tools water companies are adopting, rather than network control algorithms or systems to optimise wastewater treatment plants? It may be because they are seeing digital as a replacement for humans rather than an augmentation of their existing workforce and if that's the case then perhaps it's the management that needs replacing with AI.

## Workforce Transformation

New technology should be used to refocus human staff on things like decision making and customer service. And in these areas of decision making and customer service, digital tools like data analytics and AI can provide humans with extra insight to improve performance.

In the water industry, AI and other digital technologies should be reframed as Augmented Intelligence rather than Artificial Intelligence. Humans shouldn't be used, and can't be used, to analyse and interpret huge data sets, but utilities can use digital tools to turn big data into smart data and to present humans with a range of options for decision making. They can even provide humans with work scenarios that they can then choose from. For instance, it is possible to develop an autonomous control system for a water distribution network, which can operate pumps and optimise performance (e.g. SCUBIC), but it can't yet talk to local politicians and residents about what is an acceptable level of headroom in a given reservoir. Digital water can free up humans to spend more time on making these soft data decisions.

For example: One of the first apps developed by Severn Trent Water in the UK was a tool that provided customers with real time information on street works such as which street is being worked on and when, the purpose of the work, how long it would take, alternative routes to avoid the construction and so on. This was useful until they humanized it by giving the names and pictures of the staff doing the work and, very importantly in the UK, how they liked their tea. This immediately humanized the road work carried out by a big faceless company and created a bond with the customer. This is a perfect example of how digital tech can be made more human and can be delivered in conjunction with, rather than in opposition to, the existing workforce.



Switching to digital solutions in the water sector has multiple benefits. It enables data to be gathered, analysed, and presented as actionable information, which can increase productivity and profitability. It frees up the workforce from repetitive tasks enabling them to become more analytical or customer focussed and the data insights into customer behaviour will augment this customer-centric shift. Data rich decision making from management and workforce will increase resilience and asset life, and through the use of digital twins will enable better scenario planning and design. The data is already there, it's just

not being used to its full potential. Digital solutions provide access to the data and a digitally trained workforce can use the information from these digital tools to make better informed decisions.

It is clear that analog solutions are no longer adequate, and the digital transformation of water is unstoppable. However, digital tools are just tools and if we want to capture the full value of investing in digital technologies, we must invest in people. It is likely that during the most challenging part of the digital transformation of water it is the human capital dimension that is the most challenging but also the invest-

ment that will have a more enduring impact and return on investment. Investment in human capital, strategy and culture can create a more agile learning organization that is poised to adopt future innovations more readily.

**Investment in human capital and strategy can create a more agile learning organization that is poised to adopt innovations more readily**