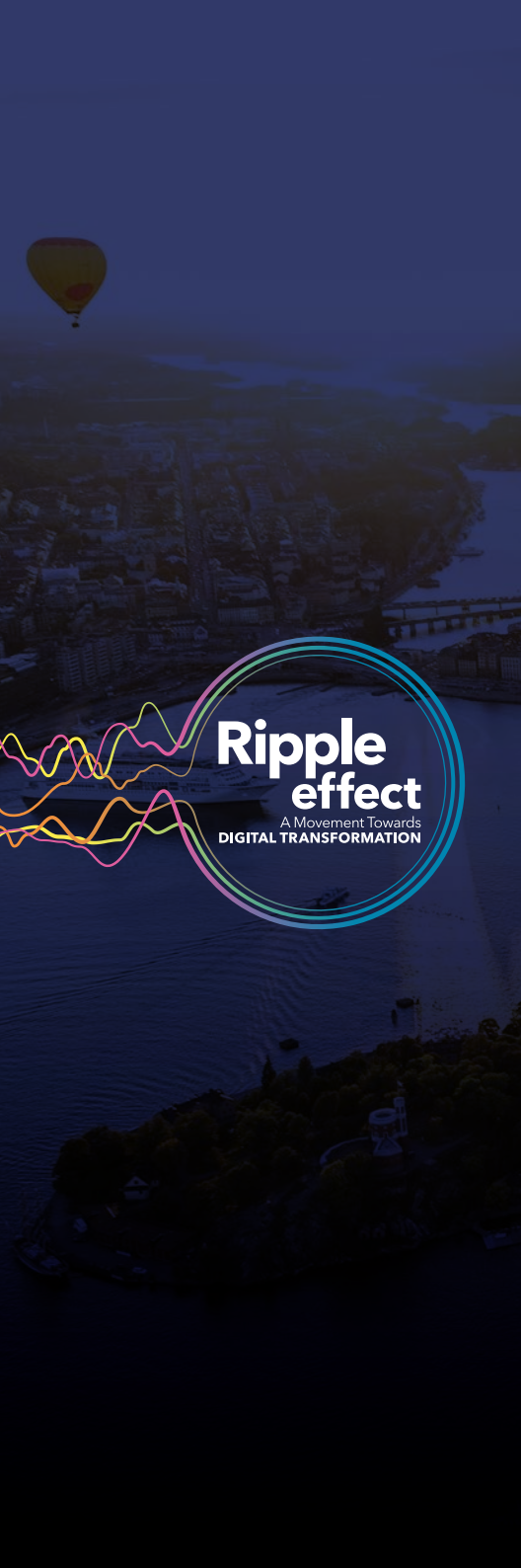


Ripple effect

A Movement Towards
DIGITAL TRANSFORMATION



Contents

Foreword: Moving From Ripple to Wave 2

The Plan: Put Strategy Before Technology 5

The People: Choose Team, Then Tech 15

The Pace: Connect Small Projects for Big Wins 22

The Proof: Show Progress at Every Step 27

Turn Insight into Action 33

Contributors 35

Foreword: Moving From Ripple to Wave

The water sector is at a moment of profound challenge and opportunity. As the sector takes on the escalating challenges of accessibility, affordability, and resilience against climate change, digital solutions have demonstrated the potential to transform water systems. For many utilities, transformation is well underway.

The label “digital” gets applied to a host of technologies and services deployed across clean water and wastewater operations - for example, using software to automate critical operational workflows within and outside of plants, using remote monitoring and control solutions to improve connectivity for workers and customers, and using software platforms to integrate utilities’ diverse IT infrastructure.

But there is no prescribed digital water journey. With more than 400,000 water, wastewater, and stormwater systems worldwide - from small rural utilities to consolidated national providers serving millions - it is critical that digital adoption addresses unique community-level challenges.

Each utility’s experience of digital transformation will be different. The common denominator is the value of data and digital technology - water, energy, and cost savings; greater operational and financial resilience; improved customer service; more rigorous regulatory compliance; and tools to address the challenges of an aging workforce.

So, what can we learn from utilities already reaping these benefits? How did they start? And how did they scale?

We spoke to 18 global water, wastewater, and stormwater utility leaders and experts to pull back the curtain on digital transformation. This paper charts their journey - and the practical lessons they have learned.



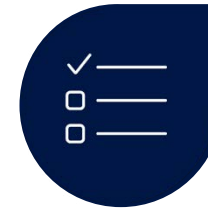
These utility leaders do not talk about “big bang” transformations. They talk about how a thoughtful, systematic approach to “going digital” can lead to powerful outcomes. And while the group consulted for this paper spans the scope of utility sizes and resources, four major insights have emerged:



1. Put Strategy Before Technology



2. Choose Team, Then Tech



3. Connect Small Projects for Big Wins



4. Show Progress at Every Step

The utility leaders and experts we spoke with – in Asia, Europe, and North America – have worked through some of the thorniest issues and opportunities of digital adoption. Their stories demonstrate that what starts as a ripple can quickly become a transformative wave.



Matthew Pine

Chief Operating Officer, Xylem



The Plan
**Put Strategy
Before
Technology**

The Plan: Put Strategy Before Technology

Utility insight:

“Going digital” is not an outcome, it is a way to solve problems. Each utility’s unique strategic goals, regulatory demands, and available data should always underpin any decision about digital investments.

- *Avoid the impulse to dive into technology. Put strategy first.*
- *Align digital strategy with regulatory expectations.*
- *Accelerate progress by using data already at hand.*

“The insights were mind-blowing.”

Avoid the impulse to dive into technology. Put strategy first



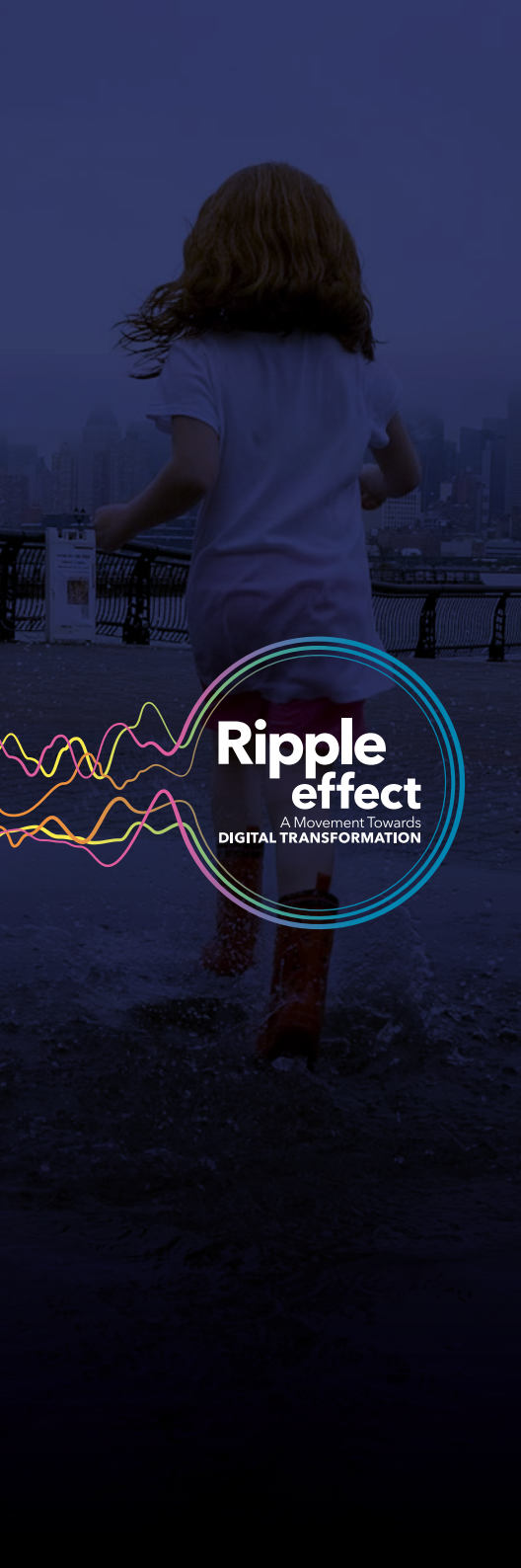
Technology is a means to an end. Before delving deep into technology, define the priority goals and outcomes. By deploying solutions that explicitly align with strategic priorities, investments will deliver measurable value and create momentum for further innovation.

Data and digital technology can be powerful, but implementation requires time and effort. For the greatest return, utilities have put these tools to work in ways that directly address their major goals. In the examples that follow, each utility identified a specific challenge and shaped a digital strategy to tackle it. In each case, the utility put strategy before technology.

The first is **Unitywater**, which operates in the subtropical climate of Southeast Queensland, Australia.

Facing a rapidly growing population and increasingly unpredictable rainfall, reducing non-revenue water (clean water lost before it reaches the customer) became a key strategic priority.

Ripple effect
A Movement Towards
DIGITAL TRANSFORMATION



Unitywater considered how digital technology could help plug leaks across its network by making it easier to find them and installed pressure and acoustic leak-detection monitoring in its 6,300-kilometer distribution network.

The utility also focused on preventing leaks on the customer side and began a Smart Meter Network trial in April 2021.

Unitywater installed more than 10,000 digital water meters and, as of April 2023, has saved customers more than \$1.3 million AUD (\$850,000 USD) and more than 286 million liters of water.

“We learned a lot of lessons from our initial 1,000-meter pilot project before launching the Smart Meter Network project as a second step in the process. Smart water meters have been a sustainable decision both environmentally and financially”, said Daniel Lambert, Unitywater’s Executive Manager of Sustainable Infrastructure Solutions.

The Takeaway

Unitywater focused on the problem it needed to solve. From there, it found the right solution for the job.

Since the 1970s, the Dutch regional water authority **waterschap Aa en Maas** has prioritized investment in technology and iterated towards more sophisticated systems to address its strategic priorities. The utility is responsible for sustainably purifying 300 million liters of wastewater for more than 778,000 residents and businesses in the province of Brabant. It saw an opportunity for data and technology to help its team deliver.

As part of its recent water-management plan, waterschap Aa en Maas explored the potential of AI in treatment processes and of broader digital optimization of its wastewater network.



“The knowledge of our process managers from the field is combined with sophisticated digital technology. We are continuously improving these systems. Computers can spot things in data that people might not see. For example, what are the dependencies, the risks you are willing to take, and the value you can derive for your utility?” said Peter Verlaan, Director at waterschap Aa en Maas.

This is not just Verlaan's intuition; he has the proof of concept. In one wastewater network project which used decision intelligence to dynamically control assets – such as pump stations and overflow locations – the resulting data showed the potential for digital optimization to reduce flow towards the wastewater treatment plant by up to 30 percent, or 1000 m³/h, during dry weather conditions.

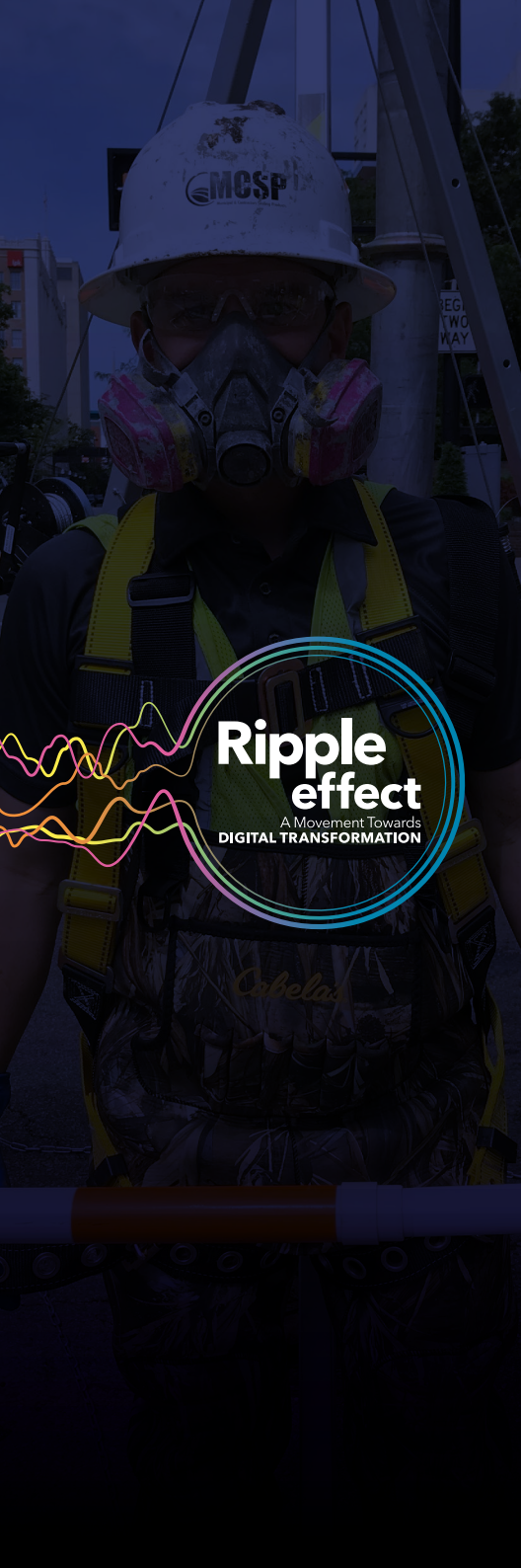
waterschap Aa en Maas is now implementing optimization solutions across its treatment plant and wider wastewater network. This is enabling the utility to meet operational goals and realize the combined impact on effluent quality through reduced chemical and energy use.

The Takeaway

Like Unitywater, waterschap Aa en Maas has demonstrated the value of focusing on the strategic problem to solve, and deploying the right solution at the right time to ensure investments deliver results.



**Ripple
effect**
A Movement Towards
DIGITAL TRANSFORMATION



Align digital strategy with regulatory expectations



Digital solutions offer a path to achieve regulatory compliance affordably. Align digital investments with regulatory requirements to sharpen strategy and maximize return on investments.

Regulation is one of the primary drivers of digital adoption. As utilities search for fresh ways to affordably achieve compliance, digital solutions are proving their worth. Applying a regulatory lens to digital investments can maximize outcomes.

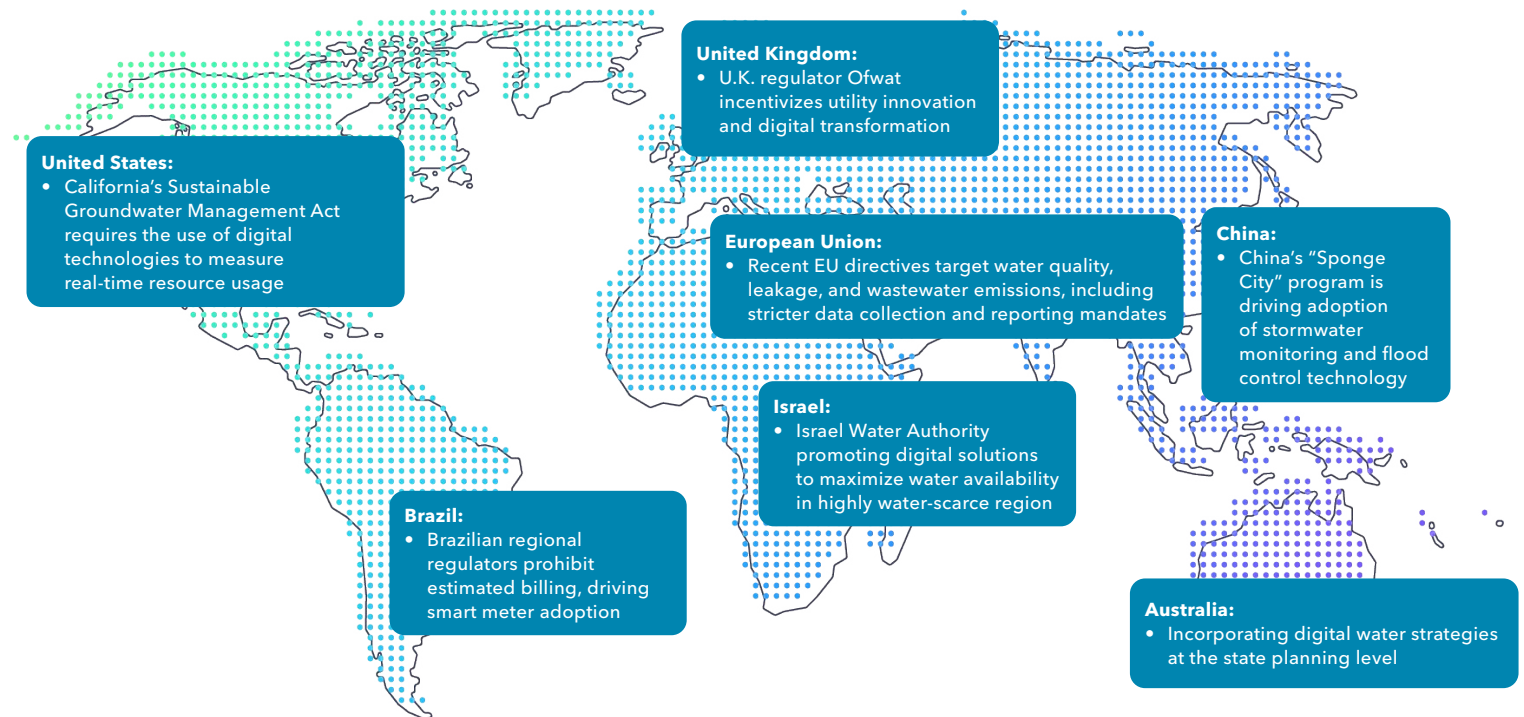
Chinese utility **Beijing Drainage Group (BDG)** has focused on using technology to help it meet the capital city's carbon-neutrality targets. These include reducing emissions by 20 percent by 2025 and reaching net zero by 2050. By implementing a suite of control systems for aeration, chemical dosing, and drainage, BDG achieved annual energy savings of 10 to 15 percent.

The emphasis on using digital technology to address local challenges is not just coming from utilities, but also from lawmakers. Understanding what authorities expect and where they see digital playing a role can focus a utility's approach.

In the U.S., for example, a 2022 explanatory statement from the Senate Committee on Appropriations makes direct reference to innovative technologies for water infrastructure. The statement encourages State Revolving Fund applicants to "utilize technology to optimize water delivery performance, reduce energy consumption, and limit water waste in distribution systems."

Select Global Water Policies by Region

The map below illustrates how digital is becoming a more prevalent part of the global regulatory agenda. These examples are also indicators of what may be coming down the line as regulators track global progress to develop local standards.

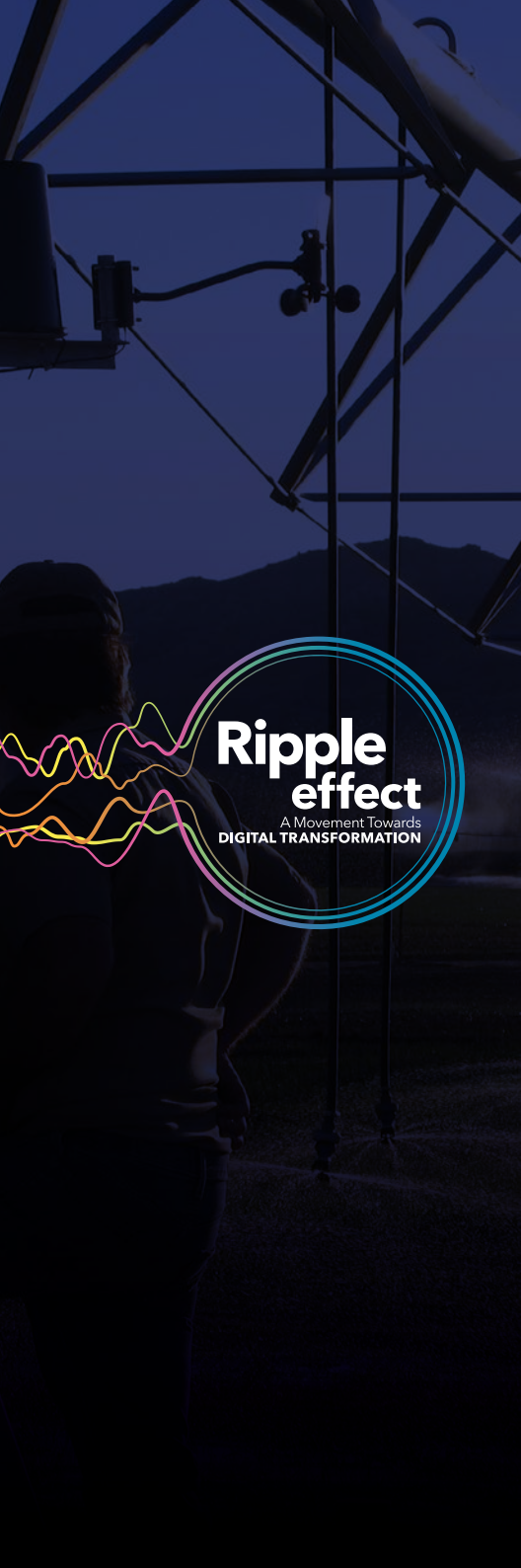


Source: Bluefield Research (2023)

The Takeaway

Digital investments are becoming an important element in achieving regulatory compliance, as utilities align strategy with regulation to maximize return on investments.

Ripple effect
A Movement Towards
DIGITAL TRANSFORMATION



Accelerate progress by using data already at hand



To accelerate digital transformation, confirm what data and assets are already available and evaluate how technology can be deployed to make the most of these existing resources.

Utilities have a wealth of data at their fingertips. But simply collecting and sharing data across departments is not enough to deliver game-changing results. That data needs to be refined and translated into something actionable. Utilities can then derive and apply insights that help make better operational and investment decisions using infrastructure already in place.

The utility leaders we spoke to describe similar steps used to leverage their data to help deliver their strategic priorities:

Catalog the real-time data currently available and determine areas where more detailed data can support operational and planning decisions.



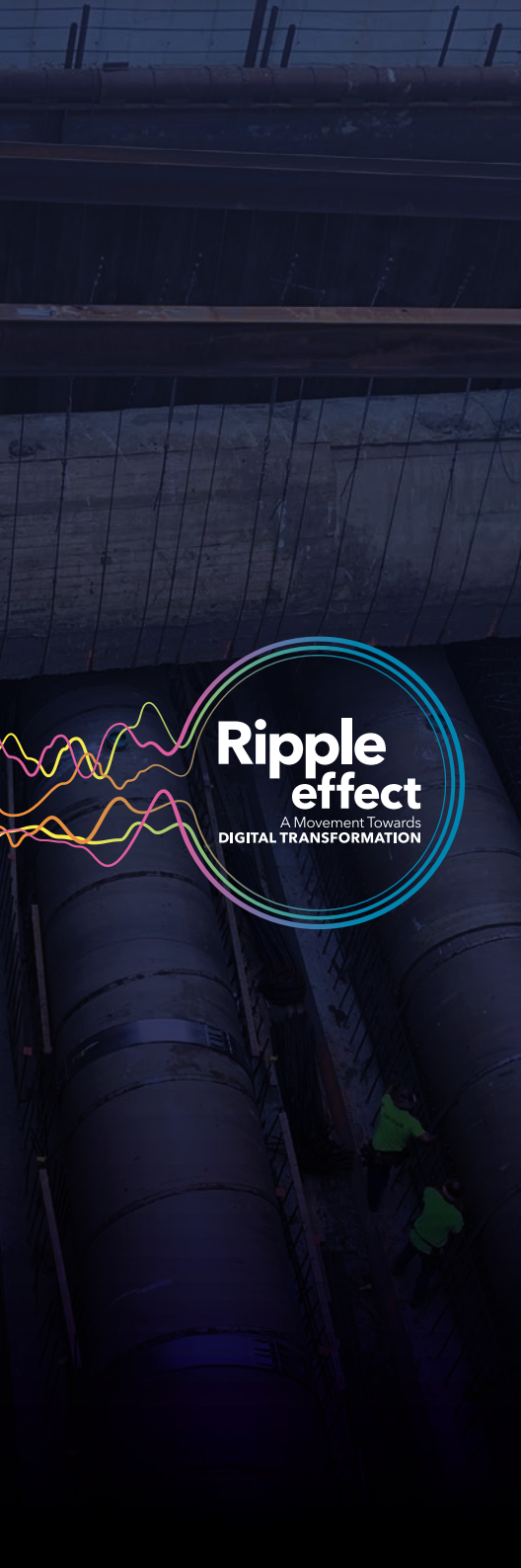
Evaluate how digital solutions can add value through a pilot project - a low cost route to determine the challenges, opportunities and potential return on investment (ROI).



Prioritize projects aligned to the problem you are trying to solve and build incrementally over time.



Take the approach of the U.S. **City of Columbus, Ohio**. According to Holly Boyer, Project Manager for the City of Columbus, *"Our existing infrastructure collected data routinely, but we were using it after the fact and not in real-time."*



Columbus highlights the strategic approach, while being mindful of regulation. The city is turning to data-driven, digitally enabled control strategies to address sewer overflows and cut operational and maintenance costs for its 1.2 million residents.

Using real-time sensor data, this approach provided plant operators with live data to help balance flows across two wastewater treatment plants. As Boyer put it:



“Getting visibility of the system has been crucial for our operations staff. Previously, they were dealing with a wall of water. At that point, it was too late to divert flows and prevent overflows. Now they know what is going on in real-time and can make data-driven decisions.”

The Takeaway

The City of Columbus experience shows the value of taking control of the data you already have. By evaluating its existing data and assets, the city identified an opportunity to “turn on the lights” in its collection system and delivered remarkable results.

Nearby, in Cincinnati, Ohio, the **Metropolitan Sewer District of Greater Cincinnati (MSD)** approached its digital transformation with a similar mindset, intent on harnessing what it already had. According to Reese Johnson, Compliance Services Division Superintendent at MSD:



“We were thinking big and asking bigger questions. What if we could control our collection system like our treatment plants? At our treatment plants, we can dial them in, we can optimize their operations with our SCADA system. But the collection system is pretty much buried; nobody knows what is going on in there. We grabbed our combined sewer overflow (CSO) monitoring data, flow monitors, and real-time control facilities, and tied them together in a SCADA system. The insights were mind-blowing.”

MSD has reduced sewer overflow volumes by 247 million gallons, around 2 percent of the total volume of water it treats annually, and saved US\$38 million in the process. As a result, the utility achieved its overflow-mitigation targets for less than \$0.01 per gallon. This was a saving of 90 percent when compared with the original estimated cost.

The Takeaway

In Johnson's own words, *"Digital transformation has allowed us to maximize the assets we already have - the assets that we've already spent billions on - rather than spending billions more to get a marginal benefit."*

Putting strategy first, aligning with regulatory expectations, and using data you have at hand - these three elements were brought together with great effect in **South Bend, Indiana, U.S.**

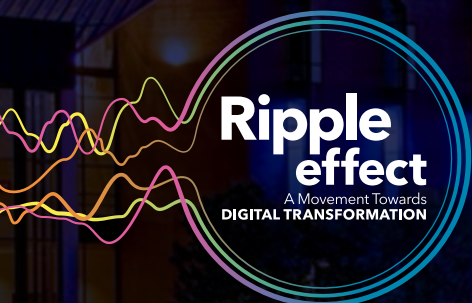
With 1 to 2 billion gallons of sewer overflow pouring into the St. Joseph's River, there was a clear strategic problem that needed solving. There was also a big regulatory driver: the city was under a consent decree and working with the U.S. Environmental Protection Agency (EPA) to adopt a long-term control plan (LTCP). The plan called for an estimated US\$713 million in capital improvements, a significant financial burden for the area's roughly 100,000 residents.

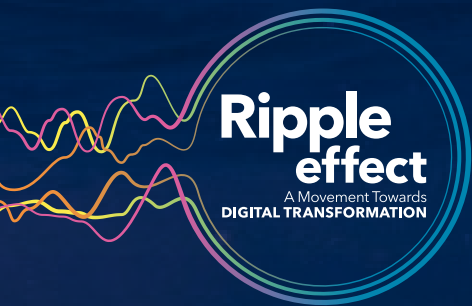
The South Bend Department of Public Works looked for a more affordable option, but every conventional approach involved prohibitive investments in gray infrastructure. Digital provided another way.

The city had already implemented a sewer-monitoring system a decade earlier, which helped pinpoint problem spots on the network for maintenance. The team saw an opportunity to do more with the data it already had. According to Kieran Fahey, Director of the city's LTCP:



"We realized we could use the smart sensor data we were gathering not just for immediate maintenance, but also for future infrastructure planning. The move from traditional assumption-based modeling to using real-time data to get the most out of the existing system would result in a huge reduction in the capital costs we had initially projected."





By 2021, the U.S. EPA and the Department of Justice approved South Bend's updated LTCP. This called for US\$400 million less in gray infrastructure investment - a 60 percent saving in the estimated total capital expenditure.

Since implementing its real-time network optimization and decision support system, South Bend has reduced combined sewer overflow volumes by more than 80 percent and delivered a 50 percent reduction in E. coli concentrations in the St. Joseph River. The city is meeting its environmental commitments a decade or more ahead of schedule.

The Takeaway

By combining a strategic approach, collaborating with regulators, and harnessing existing data assets, a utility can deliver transformative cost, environmental, and operational gains.



Turn insight into action: Use strategic goals and the regulatory backdrop as the starting point to determine where digital solutions can add value. Catalog the accessible data and identify gaps. Evaluate how digital solutions can help address the challenge and potential ROI, including considering how data sets gathered today could be leveraged to solve future problems. Prioritize accordingly.



The People Choose Team, Then Tech

The People: Choose Team, Then Tech

Utility insight:

Listen to your team and connect digital strategy to daily work. Empower operators to use data and digital tools in ways that make their work easier and optimize outcomes.

- *Put operators in the driving seat.*
- *Show the value of technology by demonstrating day-to-day benefits.*
- *Use the power of data to encourage collaboration across teams.*

“When people help shape the process, they take ownership.”

Ripple effect

A Movement Towards
DIGITAL TRANSFORMATION

Put operators in the driving seat



Utilities setting the pace in digital transformation describe a common approach to enable progress: they put operators in the driver’s seat, empowering them to use data and digital tools in ways that directly impact their daily work.

That approach helped transform how the team at **Buffalo Sewer Authority (BSA)** works together. At the turn of the 20th century, Buffalo, New York was the eighth largest city in the U.S., with a sewer system built to serve up to 1 million people. In 21st-century Buffalo, which now has a population of 275,000 people, operators inherited a sewer system much larger than needed.

BSA wanted to find a way to use the overcapacity to its advantage. Initially, the utility focused on the process and technology rather than the people, creating a “black box” that limited operator access and achieved limited results. When BSA evolved the approach to focus on people, the project flourished.

By cultivating a mutual understanding and shared responsibility across functions - from engineers and department heads to frontline operators and maintenance crews - BSA achieved something significant. As Oluwole "O.J." McFoy, General Manager of BSA, put it:



"My biggest piece of advice is to integrate people from the beginning. When people help shape the process, they take ownership. The way we deliver our projects now is completely different from seven or eight years ago. Everybody is at the table. Our technology is no longer a black box."

Having established a shared understanding of the challenge and desired outcomes, BSA used wastewater network optimization to repurpose underused parts of the system as auxiliary storage. The utility also implemented a real-time decision support system that gives operators a clear view of wastewater buildups, and recommendations on where to move water during heavy rain. The results speak for themselves. BSA reduced combined sewer overflow volumes by 450 million gallons a year, and the city saved US\$145 million in unnecessary capital expenditures.

The Takeaway

By involving and empowering staff to think laterally, BSA armed itself with the insight and support to deploy an innovative solution. It solved a critical problem at a fraction of the original projected cost.

**Ripple
effect**
A Movement Towards
DIGITAL TRANSFORMATION

Show the value of technology by demonstrating day-to-day benefits



Change is hard. A lack of mutual understanding about project objectives and potential benefits can derail even the best-laid plans. To build consensus and trust in digital transformation, it is essential to demonstrate the value technology can bring to individual roles, and to communicate the broader strategic benefits.

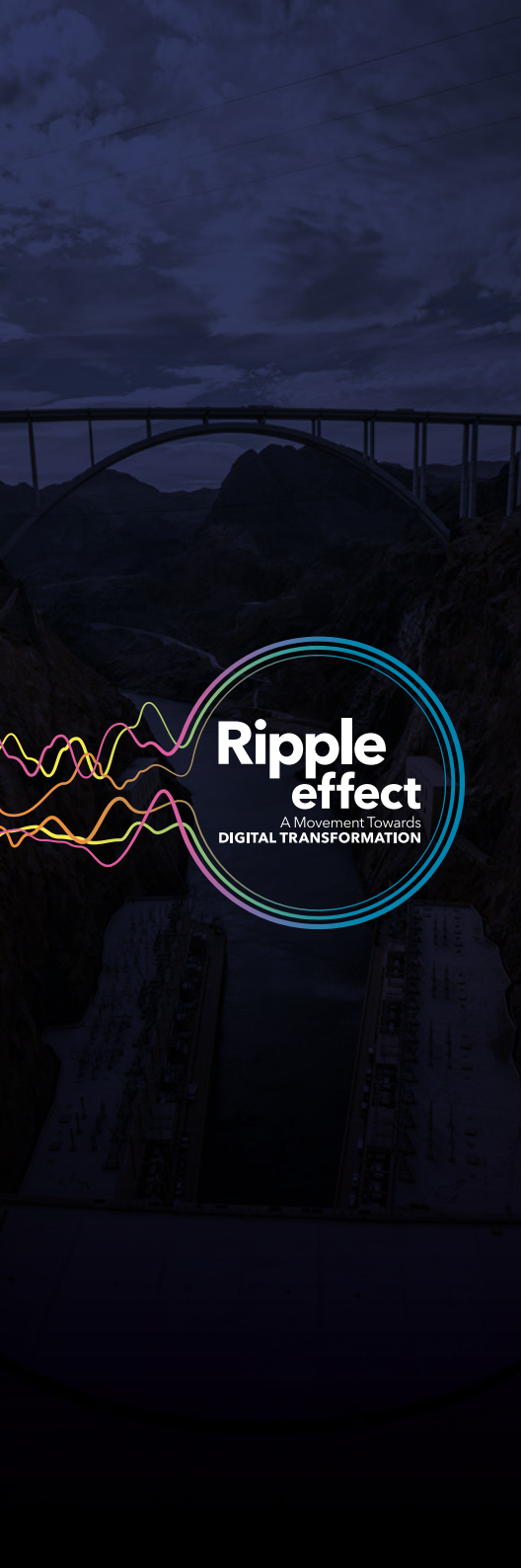
An April 2023 report by the **SWAN Americas Alliance**, [How Utilities Organize for Digital Innovation](#), cites organizational alignment as a key driver of transformation. The report states that the best way to increase comfort levels around digital innovation is to continually inform and empower all stakeholders within an organization.

Daniel Davis, Utility Design Division Chief at **Howard County, Maryland, U.S.**, advised, *“When you show it, they get it - build a little and show where it has been successful.”* Howard County Department of Public Works (HCDPW) used digital technology, including a mobile tracking application, to enable field operators to capture information on pipe breaks and help frontline workers save time.

“Having real-time information in the field is important for our service crews. Previously, they used paper maps to identify the location of water mains and valves. Now, they can see real-time information about any breaks with an algorithm that identifies what valves need to be shut down. Something that would have taken us half a day now takes about 30 minutes to an hour,” said Davis.

With the current system already significantly cutting repair times, the utility is pushing ahead with identifying more advanced digital technology to unlock greater operational efficiencies.





**Ripple
effect**
A Movement Towards
DIGITAL TRANSFORMATION

Syndicat d'eau de l'Anjou (SEA), a regional drinking water wholesaler serving 153,000 people across 65 municipalities in Western France, is taking a similar approach to combine data from several platforms – including SCADA, GIS, and customer information systems – and real-time monitoring instruments. According to Romain Lhermitte, SEA's Head of Operations:

"I explained to my operators that I wanted to optimize their roles so they could spend more time in the field, reducing the distance between them and our customers. They realized that digital transformation was not about getting rid of people, but about providing new services and adding value to our customers."

Lhermitte's philosophy, which has informed SEA's digital approach to date, is that *"the data and technologies we use should help people do their work and give their best. They should make their jobs more interesting and make their lives better."*

This tallies with the approach taken by **Consorci d'Aigües de Tarragona (CAT)**, a regional bulk-water provider serving 800,000 people, and 25 major industrial clients, across the Catalan province of Tarragona, Spain.

The utility began its digital journey in 2010 by automating treatment operations and later implementing a digital twin to reduce energy consumption. The program has delivered significant energy savings. CAT recouped its investment within just three years by optimizing pump schedules and reducing filter washing by 40 percent.

CAT's staff have realized substantial benefits from these digital transformation projects in addition to the financial and sustainability gains for the utility. As Josep-Xavier Pujol Mestre, CAT's Managing Director explained:

"Previously, our operators spent all their time in the SCADA system sending orders. Now they are less reactive and have more time to plan. They can step back and identify when something is wrong in the distribution system, or when customers are having problems, and figure out why."

The Takeaway

When it comes to technology, don't focus only on bottom-line results. Howard County, SEA, and CAT accelerated transformation by telling the full story of the benefits digital solutions could bring to operators, customers, and their broader communities.

Use the power of data to encourage collaboration across teams



Quality data can serve as connective tissue, bridging the gaps between departments to solve organizational problems. By using technology to aid communication between teams, utilities can empower staff to think and work cross-functionally towards strategic goals.

For Holly Boyer, from the **City of Columbus, Ohio, U.S.**, having a third-party control system that translates data into operational insights has been crucial. *"It opened the lines of communication between everyone from modelers to frontline operations staff."*

Boyer touches on a crucial point: the wealth of data can be spread across a variety of roles and not just confined to a handful of specialist operators. By shaping digital strategy through the lens of daily work, technology can be deployed to maximum effect.

The graphic below illustrates the possibilities for technology to deliver value across the spectrum of utility jobs:

Plant Operators

- Access real-time plant data and predictive analytics
- Enable better decision-making
- Automate mundane tasks



Customer Service Representatives

- Access real-time customer and network data
- Enable more informed, proactive customer communications
- Boost efficiency and customer satisfaction



Maintenance Crews

- Access asset location and maintenance history information
- Streamline data input
- Promote safe working environments



Finance & Planning Professionals

- Access granular asset performance and condition data
- Guide capital investment decisions
- Operationalize strategic priorities (service, resilience, equity)



Engineers

- Access granular hydraulic data
- Inform and expedite infrastructure planning
- Simulate and evaluate engineering scenarios



Upper Management & C-Suite

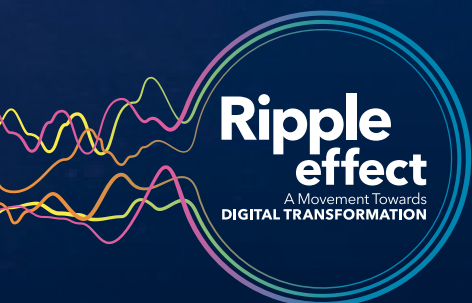
- Access real-time KPI data
- Highlight problem spots and areas of improvement
- Guide resourcing decisions



Source: Bluefield Research (2023)

Ripple effect

A Movement Towards
DIGITAL TRANSFORMATION



Malaysia’s largest water utility, **Pengurusan Air Selangor Sendirian Berhad (Air Selangor)**, has also demonstrated the value of leveraging data to drive cross-functional collaboration and deliver transformative outcomes.

Air Selangor serves a population of roughly nine million people, with 5,000 employees across ten regional offices. The utility has used data and digital tools to meet a variety of objectives, such as improving customer engagement and satisfaction via smart metering and reducing non-revenue water with intelligent leak detection and burst-pipe monitoring. Air Selangor implemented what it calls a “360-degree digital transformation strategy,” with integration across departments, systems, and datasets at its core.

An executive dashboard with near-real-time performance information pulls data from as many as 40 systems into a central pipeline or “data lake.” As Ir. Abas Abdullah, Air Selangor’s Acting Chief Executive Officer, explained, *“We have a lot of data, a lot of information, but we need it to be meaningful - we have to be able to connect all the dots.”* The company has cultivated what Abdullah calls a “digital working culture,” in part by establishing new data-focused teams that cut across existing functional groups, such as a Digital & Analytics Center and an Intelligent Command Center.

The Takeaway

Both Columbus and Air Selangor used data to bring people together to solve mutual challenges and consistently demonstrated how technology could enhance daily work. This focus on data has enabled the utilities to reshape their operations to be more connected and collaborative.



Turn insight into action: Engage cross-functional teams to ensure that technology investments deliver tools and actionable information to a broad range of departments in the utility. Speak to the operators on the ground, those working inside the utility, and those in the field. Be transparent, maintain open lines of conversation, and allow technology and data access to enable a more collaborative approach.



The Pace
Connect
Small Projects
for Big Wins

The Pace: Connect Small Projects for Big Wins

Utility insight:

Successful operators find a sustainable pace of change, delivering small wins by putting quality data to work and building thoughtfully on each success. This creates a ripple effect with efforts gaining momentum over time.

- *Prioritize quality data to build towards quality outcomes.*
- *Find the right pace of change.*

"We had a vision decades ago and focused on the future."

Prioritize quality data to build towards quality outcomes



Data is fundamental at every stage of digital transformation, from shaping small projects to scaling outcomes. But the value of data directly correlates to its quality and its accessibility.

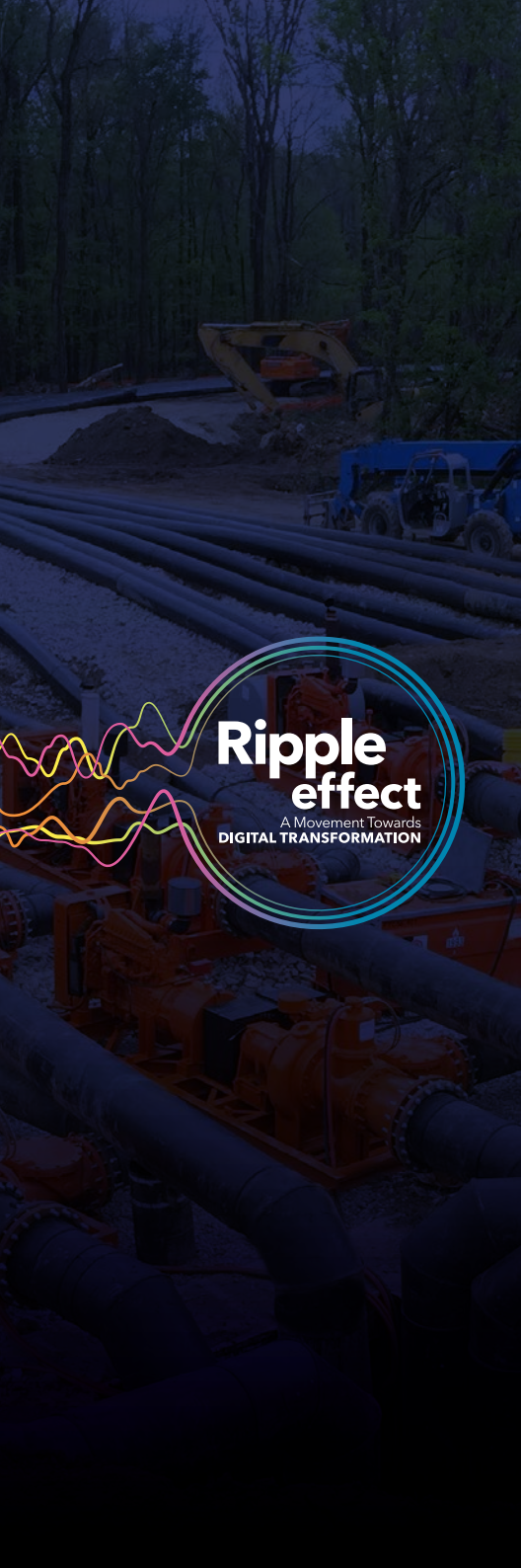
Oliver Grievson, Chair of the **International Water Association's Digital Water Program**, put it simply: "data can lie" if it is not collected and used correctly.



"The right data will get you the right results. Quality data will help you avoid drowning in numbers. The smart water journey should be considered a long-term journey - it needs a lot of experimentation, a lot of trials and validation along the way."

Grievson points out that the water industry has suffered from being data-rich but information poor. The goal is to translate that data into something useful for stakeholders.

Ripple effect
A Movement Towards
DIGITAL TRANSFORMATION



**Ripple
effect**
A Movement Towards
DIGITAL TRANSFORMATION

Companies such as **Idrica**, the Spanish water-data management and analytics provider that recently partnered with Xylem, have focused on finding ways for utilities to connect and manage their digital assets in a simple, secure, and holistic way.

Grievson pointed to what has been achieved in Valencia, Spain, where drinking water is supplied from two treatment plants and distributed through a 200 km-long mains system. The grid network is complex and requires in-depth knowledge of the system in real-time, something the local utility worked with Idrica to develop.

The model and monitoring system optimized the data over time, and the utility leveraged the insights to align the outputs to operator needs.

As a result, operators got real-time insights and forecasts into the performance of the water distribution network, ultimately saving around 1 billion gallons of water per year.

The SWAN report, mentioned above, makes the point that digital innovation is helped or hindered by an organization's ability to collect, share, and use data effectively. It adds that strong practices to make data accessible, but protected, can empower staff to try new ways of working.

The Takeaway

Quality data is critical for utility operators to gain actionable insights and unlock efficiencies.

Find the right pace of change



Digital adoption is rapidly increasing, but that should not dictate the pace of change for an individual utility. The most successful operators progress incrementally, delivering small wins and building systematically.

Bluefield Research estimates that the global digital water market will grow at a rate of nearly 9 percent this decade, outpacing spending growth on conventional utility infrastructure. Some utilities will keep this pace, others will move faster or slower. What matters is finding the ideal rate of progress for a utility's individual operation.

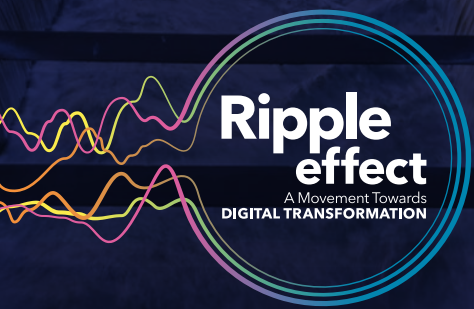
The U.S. City of **Evansville, Indiana**, has invested incrementally in technology and its people to deliver significant operational and environmental gains. Over time, the utility has added instrumentation, improved communications systems, and cultivated a strong culture of innovation.

Today, Evansville is implementing sophisticated real-time monitoring, control, and automation algorithms to reduce sewer overflows, labor costs, and energy consumption. Harry Lawson, the city's Wastewater Director of Operations, explained:

"Our experience shows the value of strategic planning. We had a vision decades ago and made sure that we focused on the future of our designs. Over time, incremental costs and changes build to allow you to reach your goals."

As Frédéric Esperet, Director of Water and Sanitation for French utility **Angers Loire Métropole**, advised:

"Utilities must understand how the system works today and where you want to go. Build the technical architecture that will support your functional needs and give you the best chance to achieve your goals."



For Angers Loire Métropole, digital water efforts are part of a broader journey to transform how community services are delivered. Since 2019, the region's local authority has embraced a smart city model focused on optimizing urban services by using sensors and data analysis. The application of digital technology in water and wastewater are key elements of the region's plan to deliver more sustainable and cost-effective services for citizens.

By understanding the current environment, and conceptualizing a vision for the future, Angers Loire Métropole found the right pace of change for its digital transformation. This has enabled the utility to build incrementally, aligning each investment to its strategic priorities and available resources, and showing progress at every stage.

"You must be methodical in your digital journey - that's key. If you don't lay the groundwork and understand your utility's current situation, progress can be difficult to maintain," Esperet said.

The Takeaway

Meaningful digital transformation of utility operations does not happen overnight. Technology adoption is most often a gradual process that connects small wins to deliver strong, long-term results.

**Ripple
effect**

A Movement Towards
DIGITAL TRANSFORMATION



Turn insight into action: Focus on the quality of your utility's data and leverage it for insight. Build digital solutions methodically, safeguarding investments by including vital considerations such as interoperability, data governance, data privacy, and cybersecurity.



The Proof
Show
Progress at
Every Step

The Proof: Show Progress at Every Step

Utility insight:

Articulate the value of digital in a way stakeholders can understand and show progress at every step of the journey. Don't wait to tell the story of what's working.

- *Build support by demonstrating meaningful benefits to the end user.*
- *Use small victories to build a coalition of support.*

"With proof, they went from a critic to a fan overnight."

Build support by demonstrating meaningful benefits to the end user



No utility makes the digital journey alone. Ratepayers and community decision-makers - mayors, council members, local politicians, executives, and regulators - are essential partners. To sustain transformation, utilities must instill confidence by communicating how digital solutions will enhance service for end users and benefit the community.

Digital solutions can be a powerful tool to bridge the gap between a utility and its external stakeholders, but only if the benefits are clearly communicated. According to the SWAN Americas Alliance [report](#) "unclear business case/return on investment (ROI) for digital technologies" are among the top three inhibitors to innovation.

Ripple effect
A Movement Towards
DIGITAL TRANSFORMATION



Data and information will add value for customers, elected officials, and regulators in different ways, as shown in the graphic below:

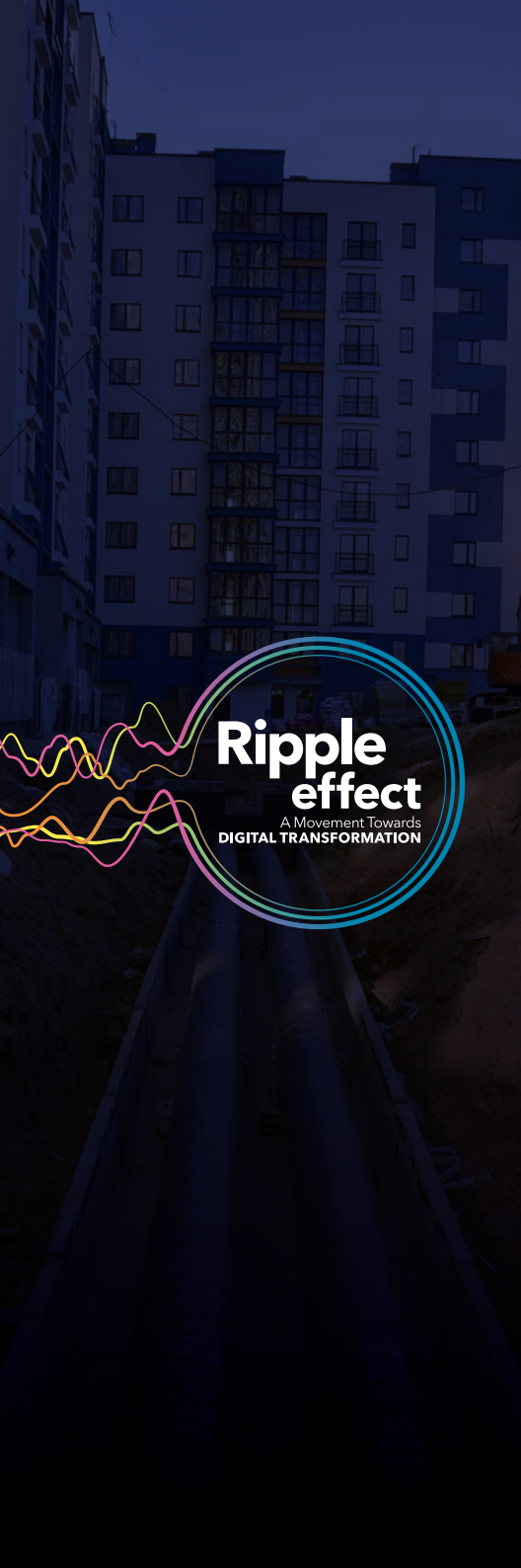


Source: Bluefield Research (2023)

Ratepayers are a driving force for transformation. As people become accustomed to living their lives online and obtaining information in real time, expectations are shifting. According to a 2022 [survey](#) of U.S. water ratepayers, the number of customers engaging with their utility over digital channels increased by 43 percent since 2019.

George Hawkins, Founder and Executive Director at **Moonshot Missions**, and former CEO of DC Water, has seen first-hand how data can improve the customer experience.

"I received a call to complain about a high bill. We went online together and viewed this person's water use - which jumped on a particular day. When they saw the date, they realized it was down to a yard sprinkler system. The issue over the bill was resolved and the customer was impressed that we could do that kind of granular evaluation. He went from a critic to a fan overnight."



Ripple effect

A Movement Towards

DIGITAL TRANSFORMATION

Many successful utilities have embraced this approach, using data and digital tools to provide value to customers with tailored, real-time information such as an outage or leak alert.

Scottish Water delivers water and wastewater services to 2.61 million households and more than 150,000 businesses in Scotland, U.K. Andrew Dunbar, Water Service Strategy General Manager for Scottish Water, described a similar impetus for change:

“Digital transformation can be as simple as improving customer information. We may not be able to stop the pipe burst from happening, but we can provide customers with regular updates as to when the water service is coming back on. There is comfort for customers in knowing that somebody is on the job.”

The Takeaway

By providing customers with information that enhances their experience, utilities can build support for a data-driven approach.

Use small victories to build a coalition of support



To rally support for digital investments, utilities need to share stories about small, incremental wins to build credibility and leverage to advance larger-scale initiatives. By communicating progress early and often, utilities can establish trust and remove the fear of the unknown for key decision-makers.

Utilities may need to combine several elements to arm themselves with the evidence needed to drive transformation. These can range from customer satisfaction feedback and surveys to financial and environmental projections and small-scale results from pilot projects.

Take **Tacoma Public Utilities (TPU)**, which prioritized stakeholder engagement to build the business case for key investments. The utility provides water, power, and rail services for more than 300,000 people throughout the U.S. City of Tacoma, Washington, and the surrounding counties. Owned by the municipality, TPU is accountable to the city council and its thousands of residential, commercial, and industrial customers.

As Corey Bedient, TPU Water Senior Project Manager, explained, in the mid-2000s, the utility successfully piloted advanced metering infrastructure (AMI), an integrated system of sensors and equipment for enhanced meter management.

Armed with the results from the pilot, the utility was ready to roll out the technology across all its power and water systems but needed support among a broad stakeholder base, as well as funding, for the expanded program.

**Ripple
effect**
A Movement Towards
DIGITAL TRANSFORMATION



The utility surveyed ratepayers and local community groups to gain input on the pilot program. The feedback was that customers accustomed to digital technologies in other areas of their lives now expected real-time data and immediate results from their local utility. Digital was no longer optional for TPU; it was essential to meet ratepayer expectations and grow the program. The customer feedback on the pilot program contributed to a compelling business case to expand AMI across the utility.

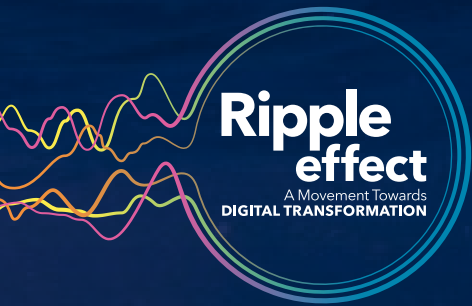
To help cover the costs, TPU applied for federal grants and deferred maintenance on its existing meter fleet, funneling the savings back to the new AMI initiative. The utility would also benefit from synergies and cost-sharing between its water and power departments.

TPU's AMI rollout - encompassing 190,000 electric meters and 110,000 water meters - is still in progress. But the utility is already seeing benefits including monthly billing, remote electric service reconnection, customer access to interval usage, and improved reliability through faster outage and leak detection.

Often, stakeholder engagement involves balancing priorities to find a pragmatic course of action. For Indra Maharjan, Director of Innovation, Technology, and Alternative Delivery at the **Ontario Clean Water Agency (OCWA)**, the game plan to drive innovation centers on collaboration.

An agency of the Government of Ontario, Canada, OCWA provides operation, maintenance, and management services for more than 450 water and wastewater treatment facilities in the province. OCWA's role is to be a trusted partner to municipalities, businesses, government officials, and institutions to help them build healthy, sustainable communities and organizations.

This means tailoring the approach to ensure that stakeholders understand the value of digital technology to a community, whether that's reducing the cost of operations, or driving energy efficiencies alongside measures to combat climate change.



The common thread in Maharjan's approach is communicating the value of small wins to ensure that a solution endures and evolves after the initial deployment. He explained:



"Digital solutions have the power to address the needs of multiple stakeholders. The challenge is ensuring everybody sees the value in that solution. My job is often to listen to everyone - solution providers, operators, and stakeholders - and think about the whole project cycle. If I can break down the project, the business case, and show value for money along the way, I can show how it is a sustainable approach."

The Takeaway

By presenting useful data and building evidence-based proposals based on small wins, operators can build coalitions of support to sustain larger-scale transformation.



Turn insight into action: Talk to your stakeholders to bridge any information gaps and build trust. Communicate results frequently and thoughtfully to show progress in a meaningful way, never losing sight of your end-users.

An aerial photograph of a city skyline at dusk, featuring a river and a bridge. The scene is overlaid with a large blue circle and several colorful, wavy lines in shades of pink, yellow, and green. The text "Turn Insight into Action" is centered within the blue circle.

**Turn Insight
into Action**



Every utility's digital transformation will be different. The utilities consulted for this paper each followed their own path to address unique goals. But their experiences show common lessons for any utility's digital journey:



Put Strategy Before Technology: Determine where digital can help to advance your unique strategic goals. Catalog available data to understand the current state of play and reveal where more detailed data can help. Evaluate how technology solutions can add value and prioritize projects for the greatest impact.



Choose Team, Then Tech: Focus on your people first. Understand what they need and empower them with technology. Engage operators early and often, be transparent, and create shared milestones.



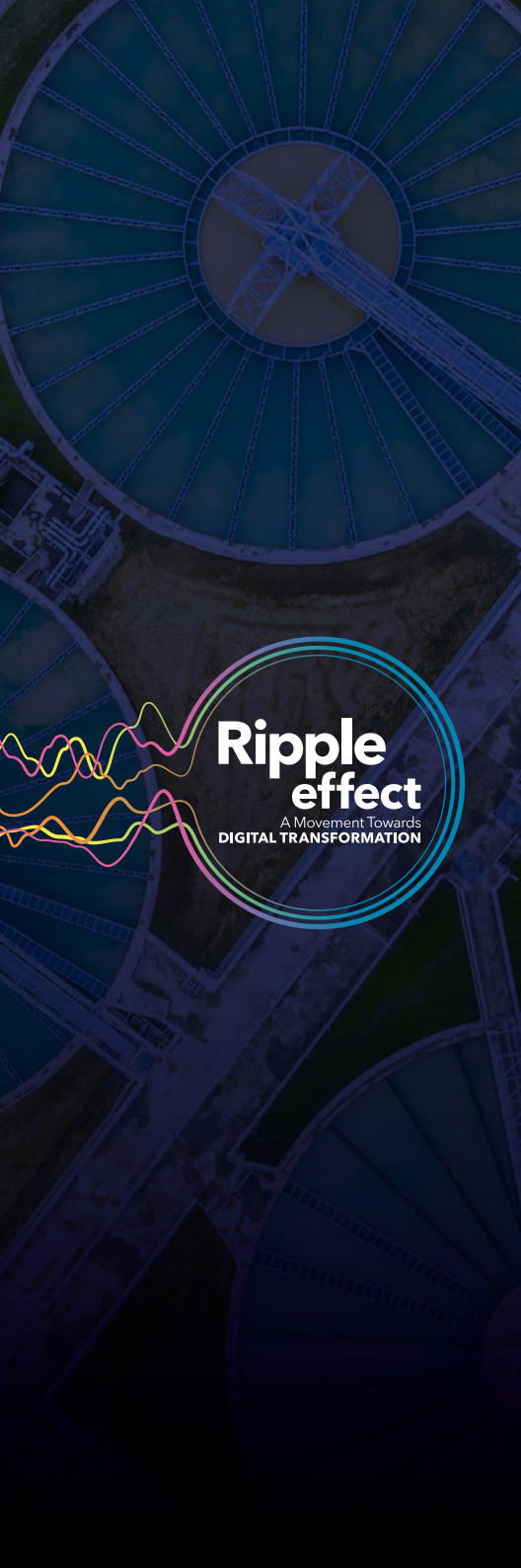
Connect Small Projects for Big Wins: Put existing data to work to deliver small, consequential wins and build thoughtfully. Run projects, iterate, and add complexity.



Show Progress at Every Step: Articulate the value of digital in a way stakeholders can understand. Tell stories about what is working and communicate frequently to share information and impact. Focus on the benefits to the end user.

These steps can help unlock the value of data and digital technology - water, energy, and cost savings; greater operational and financial resilience; improved customer service; and more rigorous regulatory compliance. Trusted partners who combine deep water domain knowledge *and* digital expertise will bring it all together to smooth the path. It's a tried and tested playbook that's already moved many utilities from a ripple of progress to a wave of transformation.

For more information on digital transformation or to share your story, visit:
www.xylem.com/RippleEffect



**Ripple
effect**
A Movement Towards
DIGITAL TRANSFORMATION

Contributors

- [Angers Loire Métropole, Angers, France](#)
Frédéric Esperet, Director of Water and Sanitation
- [Beijing Drainage Group, Beijing, China](#)
Yongtao Ge, Executive
- [Buffalo Sewer Authority, Buffalo, New York, USA](#)
Oluwole McFoy, General Manager
- [Consorti d'Aigües de Tarragona \(CAT\), Spain](#)
Josep Xavier Pujol Mestre, Managing Director
- [City of Columbus, Columbus, Ohio, USA](#)
Holly Boyer, Project Manager
- [Evansville Water and Sewer Utility, Evansville, Indiana, USA](#)
Harry Lawson, Wastewater Director of Operations
- [Howard County Water Department, Howard County, Maryland, USA](#)
Daniel Davis, Chief, Utility Design Division
- [International Water Association \(IWA\)](#)
Oliver Grievson, IWA Digital Water Program Chair
- [Metropolitan Sewer District of Greater Cincinnati, Cincinnati, Ohio, USA](#)
Reese Johnson, Principal Engineer and Superintendent
Matthew VanDoren, Supervising Engineer
- [Moonshoot Missions](#)
George Hawkins, Founder and Executive Director
- [Ontario Clean Water Agency, Ontario, Canada](#)
Indra Maharjan, Director of Innovation, Technology, and Alternative Delivery
- [Pengurusan Air Selangor Sendirian Berhad \(Air Selangor\), Malaysia](#)
Ir. Abas Abdullah, Acting Chief Executive Officer
- [Scottish Water, United Kingdom](#)
Andrew Dunbar, Water Service Strategy General Manager
- [South Bend Municipal Utilities, South Bend, Indiana, USA](#)
Kieran Fahey, Long-Term Control Plan Director
- [Syndicat d'Eau de l'Anjou, Angers, France](#)
Romain Lhermitte, Head of Operations
- [Tacoma Public Utilities, Tacoma, Washington, USA](#)
Corey Bedient, Project Manager
- [Unitywater, Queensland, Australia](#)
Daniel Lambert, Executive Manager of Sustainable Infrastructure Solutions
- [waterschap Aa en Maas, Netherlands](#)
Peter Verlaan, Director

About this paper

The research and drafting of this paper were supported by Bluefield Research

