



A 2026 State of **DESIGN&MAKE** report

Spotlight on Water

How water organizations are building smarter,
more resilient operations through digital maturity



From digital adoption to digital maturity

Water organizations are being asked to do more in an increasingly complex operating environment. They must maintain reliable service across aging, asset-intensive infrastructure while responding to regulatory requirements, sustainability priorities, changing climate and demand conditions, and persistent workforce and skills pressures. They must also make better decisions about long-lived infrastructure and use limited resources more efficiently.

In response, water utilities have spent years building digital capabilities across their operations, from management systems and

supervisory control and data acquisition (SCADA) to Internet of Things (IoT)-enabled devices, hydraulic models, connected field tools, and AI-supported analytics.

While digital adoption is an important first step, it alone does not ensure information movement across functions, a shared system view, or scalability of successful approaches. The next stage is digital maturity, where technology and data are used in connected, trusted, and repeatable ways to create sustained operational value across the asset and water lifecycles.



“Digital maturity isn’t something you ever fully achieve. Technology continues to evolve, new challenges emerge, and organizations must keep adapting. What matters is building the capability to continuously improve and make better decisions using information.”

IGNACIO CASALS

Director of Innovation, Aguas de Alicante (Spain), a water supply and distribution company



The gap between adoption and maturity is already visible across the sector. Many utilities are becoming increasingly data-rich while operating with fragmented systems, disconnected workflows, and partial views of the same assets and networks. Moving beyond these silos requires more than additional technology. It requires data continuity, quality, and governance; change management; secure connections; workforce capability; and operating models that make information part of everyday decision making.

Digital maturity is, therefore, not a single technology project or a milestone that an organization completes. It is an ongoing organizational capability. As technologies evolve and new challenges

emerge, mature organizations are better equipped to connect information, adapt workflows, learn from experience, and continuously improve how decisions are made. For water utilities, this means earlier risk detection, stronger regulatory compliance, better asset-renewal decisions, more efficient use of resources, and operations that become increasingly proactive, predictive, and adaptive.

This report examines how water organizations are progressing from digital adoption toward digital maturity. Drawing on responses from 500 water leaders across 10 countries and interviews with six industry leaders, it explores where organizations are realizing value, why integration

and trusted data are the next threshold, how maturity varies across the water and asset lifecycles, and what capabilities are needed to scale approaches.

The research shows that progress is uneven. Advanced digital adopters—respondents reporting advanced adoption of digital tools and processes for water and wastewater management—are ahead in investment, data governance, cybersecurity, workforce capabilities, and scaling technology. Their experience shows what it takes to move beyond isolated digital gains and build an organization capable of continuously improving how it manages water, infrastructure, and risk.

Digital investment is backed by confidence and early value

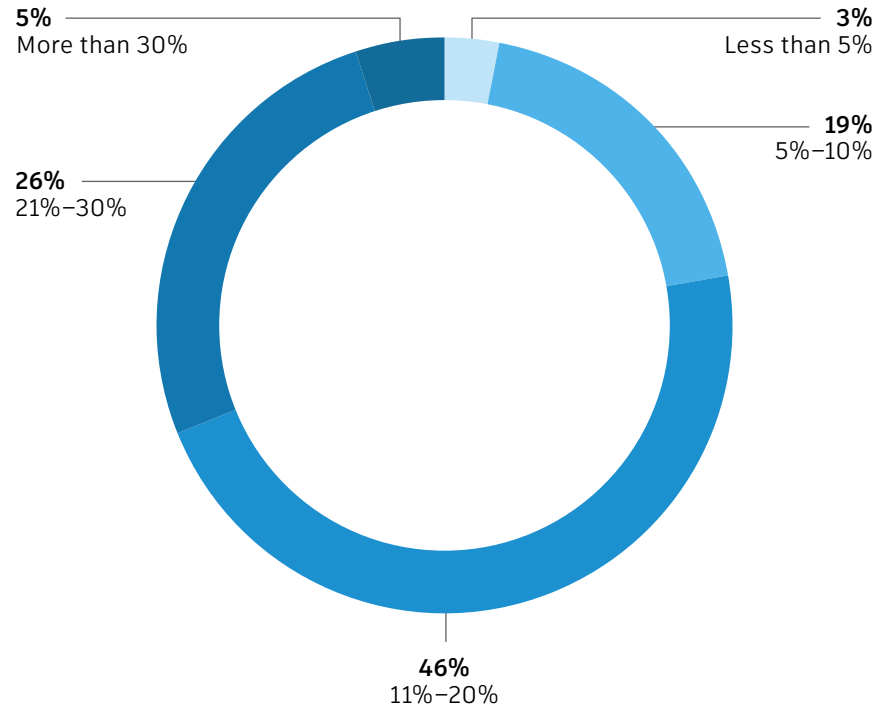
Digital tools can help water organizations operate more efficiently by automating workflows and optimizing resource use. Against this backdrop, water organizations are making substantial digital investments. Of the water organizations surveyed, 77% allocate at least 11% of their capital budget to digital transformation, and 31% allocate more than 20%. Among advanced digital adopters, that commitment is markedly higher—56% allocate more than 20% of

their capital budget to digital transformation, which is nearly double the rate of the broader survey population.

This spending is shaped by the need to make better decisions about long-lived infrastructure and respond to evolving talent needs. Workforce efficiency and skills gaps are the leading priorities, cited by 36% of respondents, while regulatory compliance, asset reliability, and sustainability follow closely at 34% each.

Digital transformation is becoming a capital priority in water

Most water organizations allocate at least 11% of their capital budget to digital transformation



Survey question: Approximately what percentage of your organization's capital budget is allocated to digital transformation initiatives? Answer option "don't know" is not displayed. Numbers do not add up to 100% due to rounding.

Most water organizations are confident in achieving their digital maturity goals

70% are very or extremely confident



Survey question: How confident are you that your organization has the leadership, funding, and workforce capabilities to achieve its digital maturity goals over the next five years?

These investments can support better outcomes in day-to-day fieldwork and infrastructure decisions. In fieldwork management, mobile work orders and digital reporting can be used in place of paper-based processes and phone calls, supporting better coordination and

visibility into field operations. For long-term infrastructure decisions, bringing together asset condition data, failure histories, and risk profiles can give utilities a stronger basis for directing resources and prioritizing investments based on risk and need. These examples frame

digital investment around the business outcomes it can support, rather than the technology itself. Digital investment can be framed through this same outcomes-based lens, where it is linked to reducing manual work in customer operations and improving the data available

for planning and analysis.

This outcome-oriented approach sits alongside strong confidence in digital maturity goals. Among the respondents, 70% are very or extremely confident that their organization has the leadership, funding, and

workforce capabilities to achieve its digital maturity goals over the next five years. Among advanced digital adopters, 87% report being very or extremely confident in achieving their five-year digital maturity goals.

The pace at which organizations are realizing value from digital investments puts this confidence in context. The survey finds that 44% typically realize value from new digital investments within 12 months, while a further 41% do so within one to two years. In total, 85% report realizing value within two years, giving

organizations an early basis for deciding which initiatives to continue, expand, or refine.

Investment, confidence, and early value support progress toward digital maturity. The next challenge is ensuring that workflows and data connect across the water lifecycle.

“Our five-year plan is about three times the normal level of investment, and that is the pattern across the whole industry.”

MARTIN JACKSON

Chief Information Officer, Northumbrian Water (UK), a water and wastewater utility



44%

of leaders typically realize value from new digital investments within 12 months

+

41%

within one to two years



Image courtesy of SA Water

SOLUTION SPOTLIGHT

SA Water advances its digital maturity with live water network modelling

SA Water has embedded a live hydraulic model in its Operational Control Centre, combining real-time network data with hydraulic modelling. Operators can assess risks during outages, test shutdown strategies, and evaluate alternative supply routes before changing the live system. The model has helped teams make faster, clearer decisions, reduce supply interruptions, and coordinate more effectively across field,

planning, and control-center functions. During unusually dry conditions, it has also enabled SA Water to identify temporary water fill points with adequate pressure and safe access while limiting impacts on pumps, storage, and overall network performance.

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Integration is the next threshold for digital maturity

Digital tool adoption is becoming widespread across water organizations. While 83% of respondents report average or advanced adoption of digital tools, only 24% report advanced integration across systems. This means many utilities are still data-rich but integration-poor. Teams may have access to more data, but when data remains fragmented, engineers, operators, and field crews work from partial views of the same water system. Integration gives them the system context for coordinating decisions across planning, operations, and field response. As Frank Zamora, chief information officer at Acciona Agua, explains, “DAMA, our central data platform, connects data from control systems, IoT sensors and enterprise resource planning (ERP)—one reliable source of data every employee can trust.”

But creating a shared view is not enough. Governance determines how data is owned, maintained, and used. Across all respondents, 57% report mature data governance—42% report owned, governed, and shared data across

the supply chain and full asset lifecycle and 15% report automated, ecosystem-wide data governance that supports real-time enterprise decisions. Clear ownership and standards reduce the need to reconcile competing records and help data remain usable from planning and design through construction, operations, maintenance, and renewal.

Governance establishes responsibility for data, but its usefulness depends on data quality and accessibility. Improving data quality and accessibility is one of the most frequently identified enablers of digital transformation, cited by 35% of water organizations. Simply collecting more data is not enough. It must also be structured, reliable, and available to the people who need it. Outdated asset records without current field context can leave teams with different views of an asset’s condition, while current and accessible data provides a shared basis for maintenance and renewal decisions.

57% of respondents report mature data governance

15% report automated, ecosystem-wide data governance

Strong systems integration is critical to turning water-system signals into field action

Only 24% report advanced data connectivity and integration across systems, showing why water organizations need stronger links between operational data and daily decision making



Survey question: How would you describe your organization's current level of data connectivity and integration across systems? Numbers do not add up to 100% due to rounding.

"I'd define digital maturity as the degree to which technology has been adopted into a daily workflow, and to me it's that daily workflow component that's the most important aspect."

BEN EPPSTEIN, P.E.

Engineer, Tarrant Regional Water District (US), a raw water supplier and flood control agency

The widespread use of AI makes the quality of connected data even more consequential. Our research finds that AI-powered capabilities are already embedded in the digital tools used by 94% of water organizations. Utilities are applying AI to anticipate equipment failures, identify unusual network patterns, prioritize field response, and optimize treatment processes. Casals says, “Digitalization has been key to improving energy efficiency, especially in wastewater treatment. We have been able to optimize the processes in these plants, especially the aeration process, and we have been able to optimize this to reduce energy consumption to a great extent.”

AI capabilities can improve operational decisions and resource use, but they depend on connected, reliable, and traceable data, including the current and historical context needed to interpret patterns and make predictions.

As connected data and AI-supported capabilities become more embedded in decision making, protecting the systems and data behind them becomes part of the same foundation. Cyber incidents can compromise the integrity of data used to monitor system conditions, restrict access to critical systems, and disrupt essential water and wastewater services. Given its significance, 76%

of water organizations focus on integrated or proactive cybersecurity across IT and OT systems. Advanced digital adopters are ahead with 96% reporting integrated or proactive cybersecurity. Integrating cybersecurity across IT and OT ensures service continuity and preserves the integrity and availability of data used to make decisions.

When data can move securely between systems, be trusted, and be applied in daily decisions, insights can drive action across the entire organization and water lifecycle.



“We have around 70,000 sensors in our sewer network. The technology uses machine learning to identify which alarms matter most and helps us prioritize where we send field resources. We now find blockages before customers call us because the system detects problems before sewage leaves the pipe.”

MATT HUMPHREY

Head of Asset Management, Anglian Water (UK),
a water and water recycling company



SOLUTION SPOTLIGHT

Aguas de Alicante's digital twin water transformation

Aguas de Alicante uses hydraulic digital twins to connect geographic information system (GIS), asset, weather, and consumption data across its integrated water cycle. Teams can quickly test supply scenarios, compare groundwater and desalinated sources, and link rainfall forecasts to wastewater models to predict when and where flooding may occur. The utility also models maintenance and repair work before crews act,

helping reduce disruption and keeping system knowledge current. Beyond modelling, its water-reuse program saves millions of cubic meters of potable water by supplying regenerated water for urban irrigation across Alicante and surrounding municipalities.

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Digital maturity requires progress across the entire water lifecycle

Digital transformation is not advancing evenly across the water sector. Survey data suggests that digital maturity varies across the water lifecycle, with water and wastewater treatment emerging as the strongest area. Nearly half of the organizations (47%) surveyed report high digital maturity in treatment, providing a foundation that other functions are yet to match. According to Zamora, the difference comes down to where the industry began its digital journey. He says, “Treatment and desalination

plants have used automation for many years, so they’re more mature. Networks are spread out and complex, so they’re harder to digitalize.”

Treatment facilities are also generally above ground, making them more likely to be monitored and controlled. But outside the plant, below-average digital maturity is highest in raw water strategy and source management (20%) and distribution (17%). Since these gaps affect decisions across the wider system, utilities are looking toward lifecycle optimization

and directing digital investment across multiple operational areas.

The survey shows relatively even investment priorities targeting treatment (47%), storm and sewer systems (46%), collection and wastewater systems (46%), and raw water strategy and source management (45%). This distribution suggests that utilities recognize the need to strengthen performance and resilience across multiple parts of the water system, rather than focusing on investment on individual facilities.

Treatment plant performance, for example—including capacity, efficiency, and regulatory compliance—can be influenced by conditions throughout the wider water system. In drinking-water systems, changes in source-water quality, such as elevated catchment turbidity, can disrupt treatment operations and increase compliance risk. In wastewater systems, insufficient visibility across collection networks can allow blockages, infiltration, or sewer overflows to escalate before operators can intervene. Greater visibility helps utilities move beyond reacting to individual problems and plan

for what is coming next.

Ben Eppstein, P.E., engineer, at Tarrant Regional Water District, explains, “When you go one step above that, you will use that technology to plan. You’re not just dealing with the problems of right now, but you’re predicting needs and problems coming down the line.” This ability to plan reinforces why utilities are building digital capability across the water lifecycle, where operational resilience depends on coordinated visibility and decision making across interconnected assets and processes.

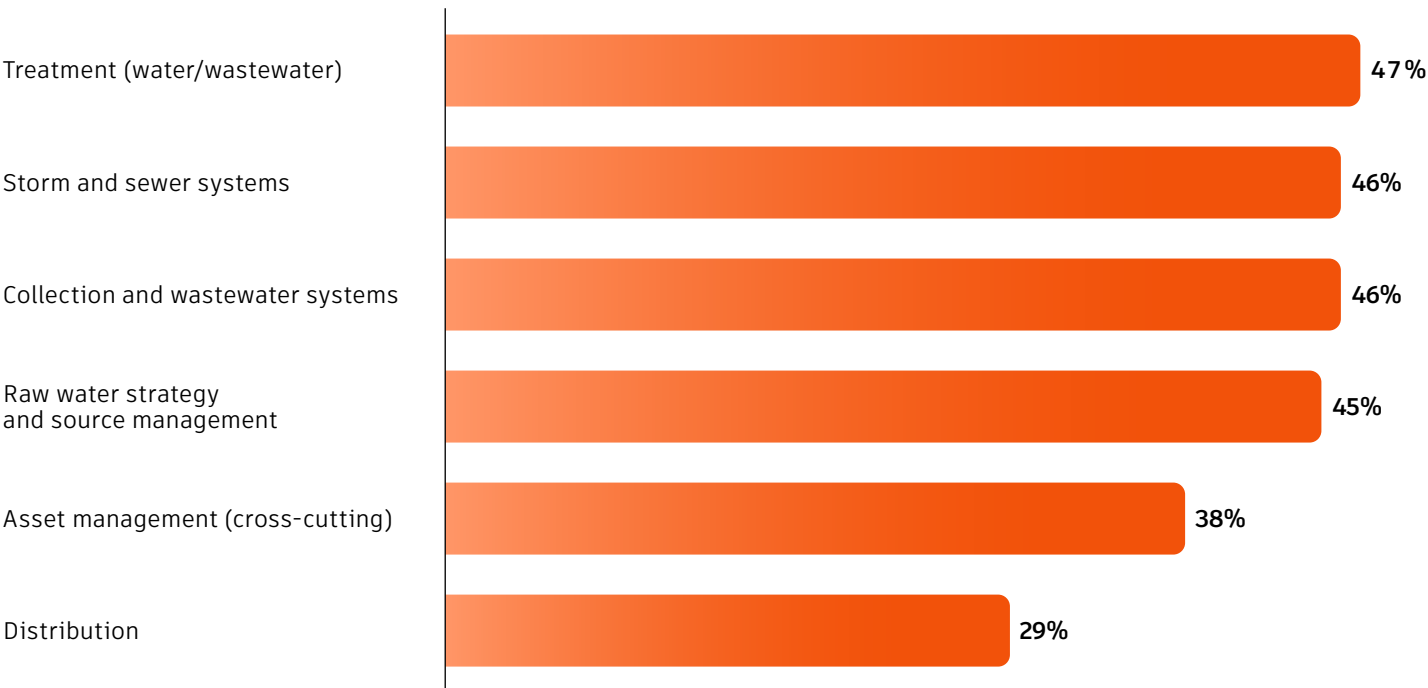


“We’re constructing a lot more assets. Making sure information flows from construction into business-as-usual operations, rather than being lost, is where the focus is now.”

MARTIN JACKSON
Chief Information Officer,
Northumbrian Water (UK), a
water and wastewater utility

Digital investment priorities span the water lifecycle

Treatment, storm and sewer, collection and wastewater, and raw water strategy are each selected by 45%–47% of water organizations

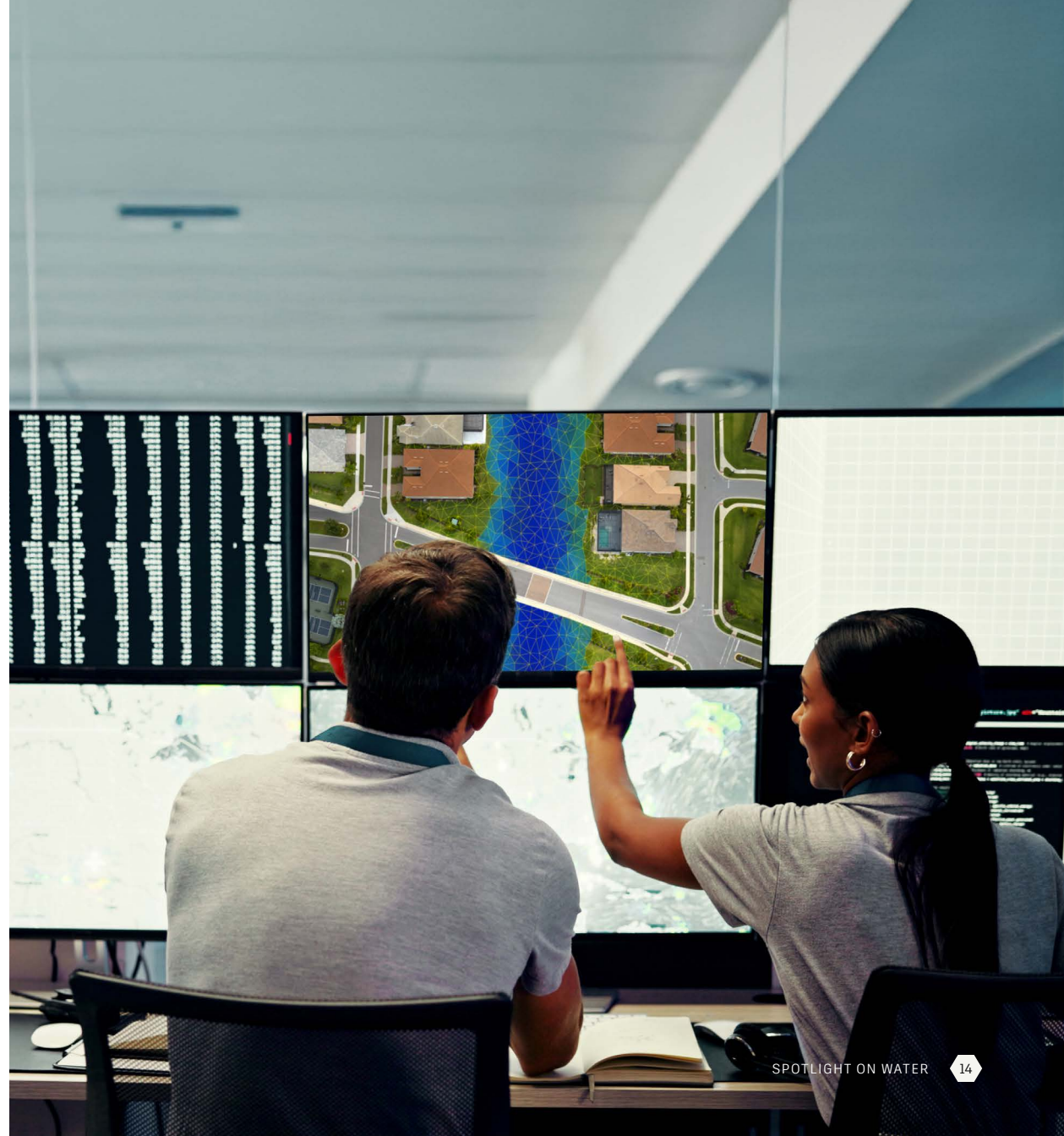


Survey question: Which business functions are the highest priority for digital investment at your organization over the next 2–3 years? Please select up to three. Percent selected. Answer option “other” is not displayed.

This wider view is only as useful as the data behind it. As organizations extend digital capability across the water lifecycle, they must also preserve data across the asset lifecycle—from planning and design through construction, operations, maintenance, and renewal. Planning data, including hydraulic and hydrologic models, demand forecasts, network scenarios, and risk assessments, should remain connected to the assets and systems they represent. This continuity should carry through design and into the latter lifecycle stages, where operational data, inspection results, and maintenance histories should also remain tied to the asset. Maintaining these connections allows utilities to compare planned performance with actual conditions and carry reliable information forward into maintenance, renewal, and future capital planning.

Casals explains, “The challenge isn’t simply collecting data anymore. It is ensuring that information is structured, reliable, and available to the people who need it so that it can support decision making across the organization.”

The value of that data is put to the test when capital projects move into business-as-usual operations. In practice, carrying data generated during delivery through handover and into operations gives teams continued access to asset drawings, models, manuals, and maintenance records when they need them. Bringing these materials together also makes gaps and inconsistencies easier to identify and correct. Keeping data usable through the asset lifecycle depends on the people, skills, funding, and repeatable workflows that make digital practices part of daily work.





Scaling technology and AI adoption by building workforce and organizational capability

As AI-supported tools enter the day-to-day work of utilities, a broader digital-adoption challenge emerges: how to integrate new capabilities into existing workforce responsibilities and ways of working. Organizational change and adoption were cited as barriers by 36% of respondents, while 34% said their workforce resists new digital technologies. Matt Humphrey, head of asset management at Anglian Water, describes the cultural difference organizations may need to bridge: “We’re an infrastructure company, and we employ people who like spanners and diggers. They’re

not necessarily the same people who love data and the digital environment.” Friction arises when new digital workflows are introduced as administrative requirements rather than as practical tools that help teams manage day-to-day operations.

These challenges do not, however, point to a broad lack of skills. While 77% of respondents report that their organization already has the skills needed to use digital tools effectively, 52% struggle to find qualified candidates with digital and data skills. The challenge is not whether employees can use digital tools, but whether

organizations can develop and attract hybrid capability that combines water-process knowledge with digital and data skills.

Organizations are responding by building those skills within existing teams while seeking these skills in new hires. As Zamora says, “The technology and budget are there, but finding people who really understand water processes and know how to work with data and digital tools is difficult. We are investing a lot in training our existing teams and looking for new hybrid profiles that understand both water management and technology.”

77% report their organization already has the skills needed to use digital tools effectively

52% struggle to find candidates with digital and data skills

Training in digital technologies is an organizational priority for 79% of respondents, while 37% identify better training and upskilling programs as an enabler of digital transformation. AI makes the requirements of that training more specific. Employees are required to understand the underlying water processes, verify AI-supported outputs, and remain responsible for how those outputs are applied.

Employees can also play a role in identifying where AI can support their work. As Casals says, “What’s different about AI is that, to a great degree, it’s developed bottom-up—many initiatives come from staff themselves.” As these initiatives become part of day-to-day work, they help employees utilize their field knowledge and combine it with technology usage. For

example, water operators increasingly need to pair the process knowledge they bring to routine work with the ability to interpret dashboards, work with data, and use digital tools.

Sustaining these capabilities also requires institutional support. In the survey, 38% of respondents identified more budget and funding as an enabler of digital transformation. Digital capabilities depend on ongoing resources for software subscriptions, systems integration, platform maintenance, cybersecurity, data stewardship, and training. Long-term support also needs executive sponsorship, a clear business case, and regulatory guidance. These forms of support sustain the skills, systems, and practices needed to extend successful initiatives beyond individual pilots.



Top enablers of digital transformation:



37%

say better training
and upskilling programs



38%

say more budget
and funding

“In terms of excitement, we’re in an industry that has more work right now than we’ve got people to deliver. We’re scaling up, and, for me, that’s when the sweet spot for technology and innovation and all those things comes to life. There has never been a better time to work in technology and innovation than right now.”

MARTIN JACKSON

Chief Information Officer,
Northumbrian Water (UK), a
water and wastewater utility



This transition, however, remains difficult, as 32% of respondents cite scaling successful pilots as a barrier. Water organizations are addressing this challenge by improving integration between systems and developing standardized approaches that can be deployed across geographies without compromising delivery time or quality. Together with ongoing training and institutional

support, standardization helps extend successful approaches across teams and operations without rebuilding them for every setting.

Digital maturity depends on the skills, institutional support, and standardized practices needed to make digital and AI-supported work routine and take successful pilots to scale.



SOLUTION SPOTLIGHT

Scottish Water transforms its hydraulic modelling, cuts 100 written reports per year

Scottish Water has transformed hydraulic modelling from a specialist, report-heavy function into a shared enterprise resource. Its platform now supports around 340 network models covering 94% of Scotland's population, and it can run 45–50 simulations simultaneously. By giving flooding teams and planners access to model results, Scottish Water brought down more than 100 annual flooding reports to zero, allowing hydraulic modelers to focus on engineering. The company expanded its modelling team from

four to 33 specialists, giving the organization greater capacity to focus on engineering and extend modelling expertise across the business. By implementing standardized workflows, automation, and cloud collaboration, it has also scaled insight access across the business without increasing administrative burdens.

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Conclusion

Every water utility must determine where digital capability can amplify the intelligence needed to achieve safe, resilient, sustainable, and inclusive water management. Utilities that take this approach strategically align digital investments with operational priorities. They create a robust foundation of trusted and governed data so that people, processes, and technology work in unison to support business needs and performance.

This alignment marks the transition from ad hoc technology adoption to

digital maturity. As utilities progress, the emphasis shifts from isolated projects to coordinated, repeatable decision making across the entire water lifecycle, producing an adaptive organization capable of continuous improvement.

This is because digital maturity is an organizational state, not just a technical one. It is evident when a field crew, a planner, and a control room operator all work from the same version of the truth. It is evident when data created during planning and

construction remains useful throughout maintenance and renewal decades later. It is evident in decisions that are predictive, coordinated, and repeatable rather than reactive. That is what separates advanced digital adopters from their peers—not different technology, but a system built to use it effectively.

Achieving this requires an institutional commitment to data readiness, where fragmented operational records become a secure, dependable source of knowledge. To turn technology adoption into

lasting operational strength, these trusted records must remain usable across the asset lifecycle—from planning and design through construction, operations, maintenance, and renewal.

While digital maturity may have no true finish line, pursuing it enables utilities to learn from each event, improve the next decision, and move from reactive responses toward proactive, repeatable decisions that strengthen how they protect water quality, manage public assets, and serve their communities.

About this analysis

The data for the *State of Design & Make: Spotlight on Water* report is derived from our Spotlight on Water survey. It includes self-assessments and responses from 500 water leaders across 10 countries: Australia, Canada, India, Ireland, Italy, New Zealand, Spain, the United Arab Emirates, the United Kingdom, and the United States.

The report also features six qualitative interviews with leaders in the water industry.

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