



Changing the Digital Transformation Game in Water Utilities

Harmonizing Technology Investments to Enable Self Sustaining Transformation



While water utilities move across a layered technology pattern to enable digital capabilities, they do not follow the same order to complete the pattern. This affects business benefits and the value derived from use cases.

Trends shaping the Water Utility industry



By 2030, under an average economic growth scenario and if no efficiency gains are assumed, global water requirements would grow by a full 40% above current accessible, reliable supply.¹



With nearly two-thirds of the world's population estimated to live in water stressed areas by 2025, utilities are focusing on the efficient production, supply, use, and reuse of limited water resources. This is being achieved through the rehabilitation of aging assets, advancements in treatment technology, decentralized solutions, and smart solutions.



Challenges from COVID-19 have placed additional pressures on sustaining business operations with 75% of utilities in a survey² indicating that "Absenteeism and the Continuity of Operations" was their number-one challenge, with 46% rating field operations as their number 2 challenge.



Digital technologies will play a key role not only in addressing pandemic-related challenges but also in driving significant economic and environmental improvements³. Every water utility CIO we have spoken with said they expected to use digital technologies in key areas of day-to-day operations by 2024.

For water utilities, digital initiatives tend to revolve around optimization, enhancing customer experience, improving operational efficiency, uplifting field force experience, digitizing manual workplace functions, and improving infrastructure.

Challenges driving disruption in the market

All Australian water utilities are government owned with a regulated funding model that drives preapproved budgets. So, their income is fixed while costs are steadily increasing.

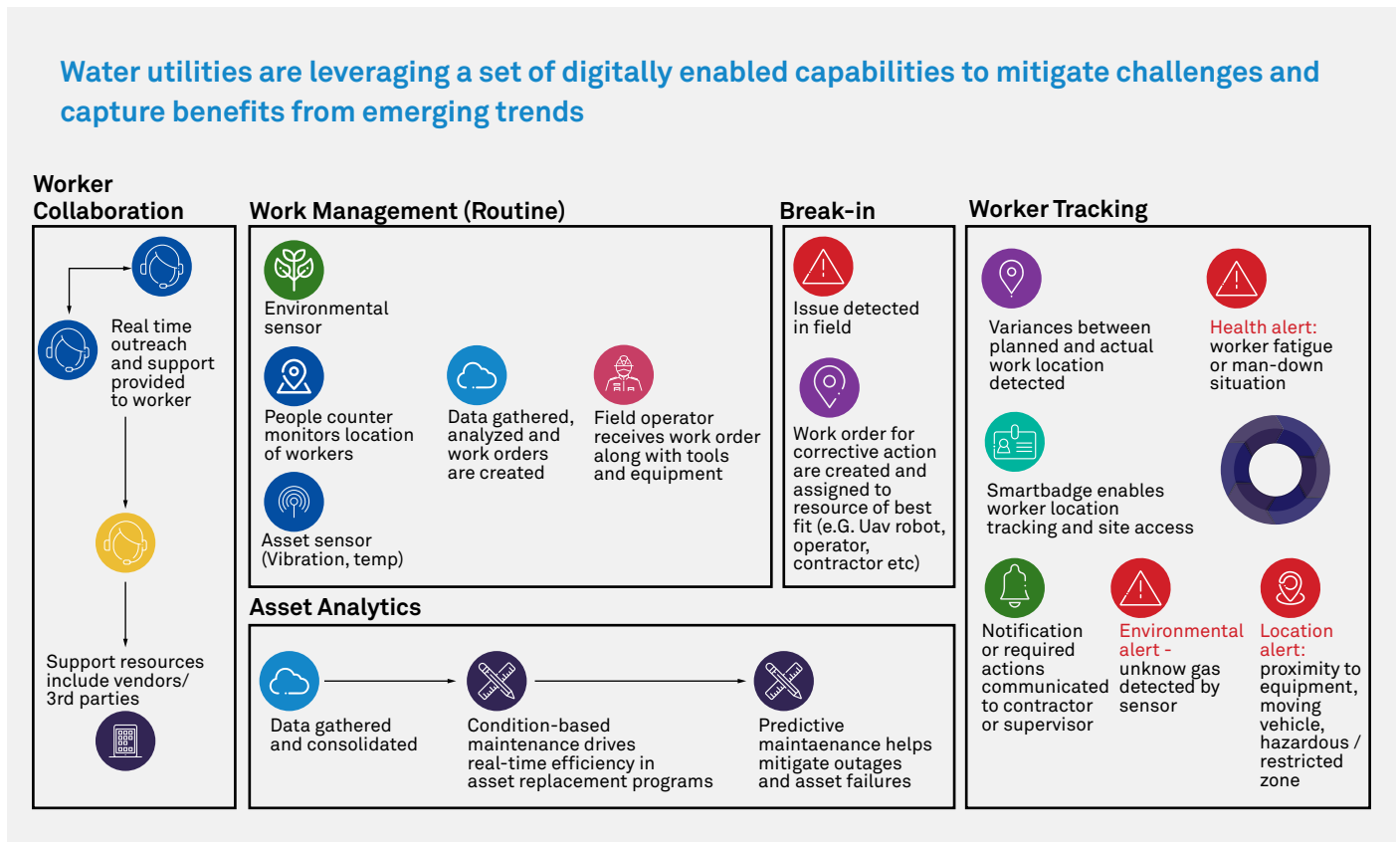
There is pressure on CDOs and CIOs to operate efficiently with much lower or similar budgets. Customer expectations are increasing; CDOs and CIOs need to be in line with expectations around sustainability, conservation, emissions and minimal environmental impact.

Meanwhile advances in technology such as Supervisory Control and Data Acquisition (SCADA), IoT, Data and Analytics and Cloud, present an opportunity to shift gears from a reactive traditional utility model to become proactive digital utilities e.g. drive predictive asset maintenance, customer self-service, bill shock prevention, real time water quality monitoring, etc.

Digital capabilities high performance utilities are building to address these challenges

Current trends have driven water utilities to invest in building a set of digital capabilities. These capabilities are helping them to mitigate key challenges that they're facing and to enable a series of use cases that provide tangible business benefits.

For example, worker tracking is being used to drive improvements in workers safety through fatigue detection or productivity metrics derived from the variances between planned and actual work locations. Asset analytics is being leveraged to move from proactive maintenance to predictive maintenance.



Key capabilities and example use-cases in play are:

- Analytics for customer insights
- Machine learning and AI to enable predictive operations and network management
- Ability to drive analytics about the water network
- Self-service portal where citizens can interact with their own data
- Usage estimation for billing, budgeting and forecasting
- Remote device management

A definite pattern in technology investments to build digital capabilities

We have observed some key trends from our partnerships with water utilities.

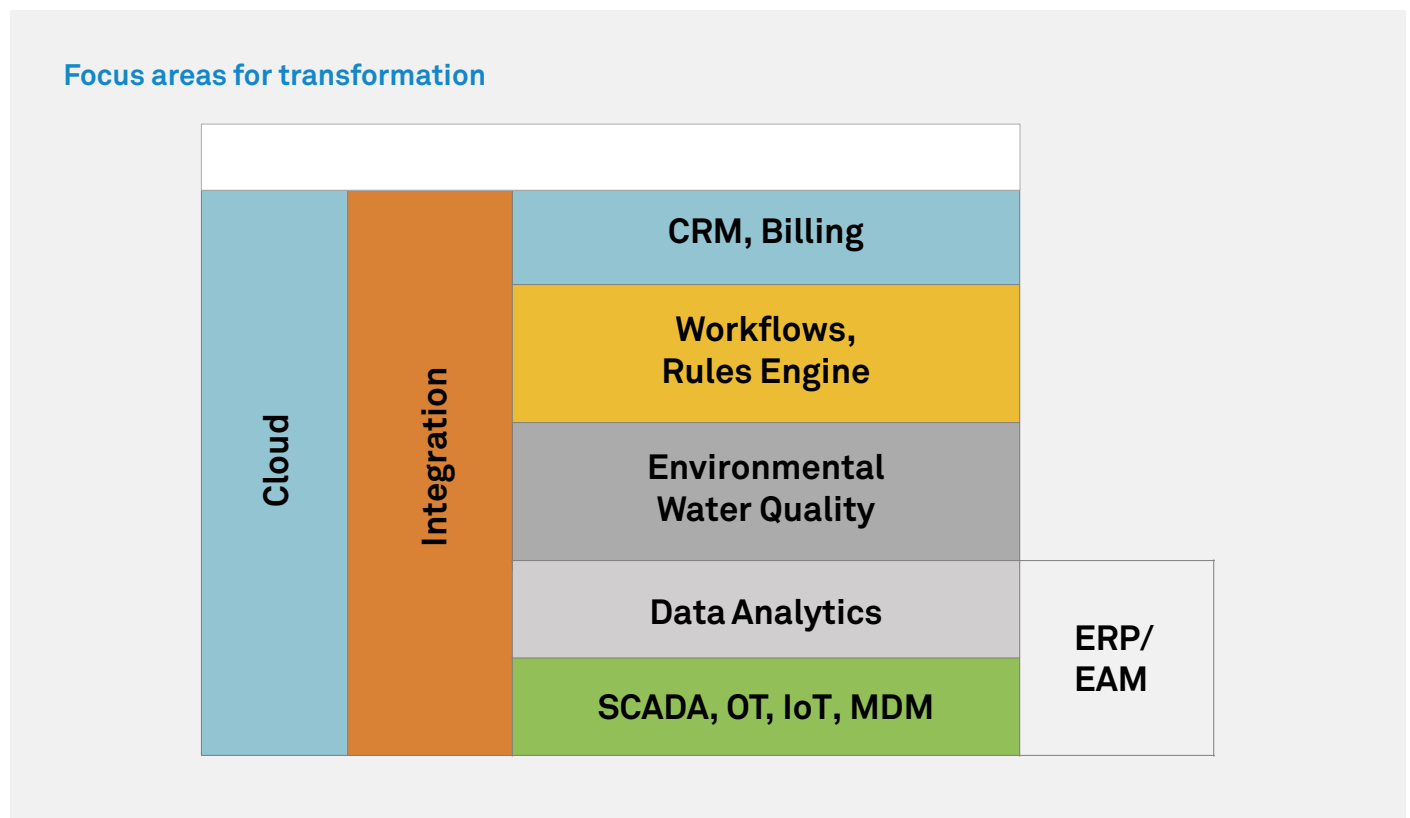
Water utilities are enabling digital capabilities leveraging a consistent set of technology elements that form a pattern. Basically, water utilities are completing the same pattern in their journey to become digital utilities.

At the very basic layer of this pattern are operating technologies that include SCADA, telemetry and smart meters. Closely associated with this layer is IoT which includes a vast array of sensors, gateways and integrations into analytics engines. The analytics engine in-turn enables multiple use cases like predictive asset management, field force optimisation, asset digitization, leakage detection, etc. An adjacent layer includes workflows and rules engines which help these utilities to model processes, identify bottlenecks and to optimise for efficiency gains. These include rules overlays for better control of workflows.

Another key priority for water utilities has been the customer experience and billing layers. They have committed significant investments and management time to drive transformations around improving the customer experience managing customers and on enhancing their billing capabilities.

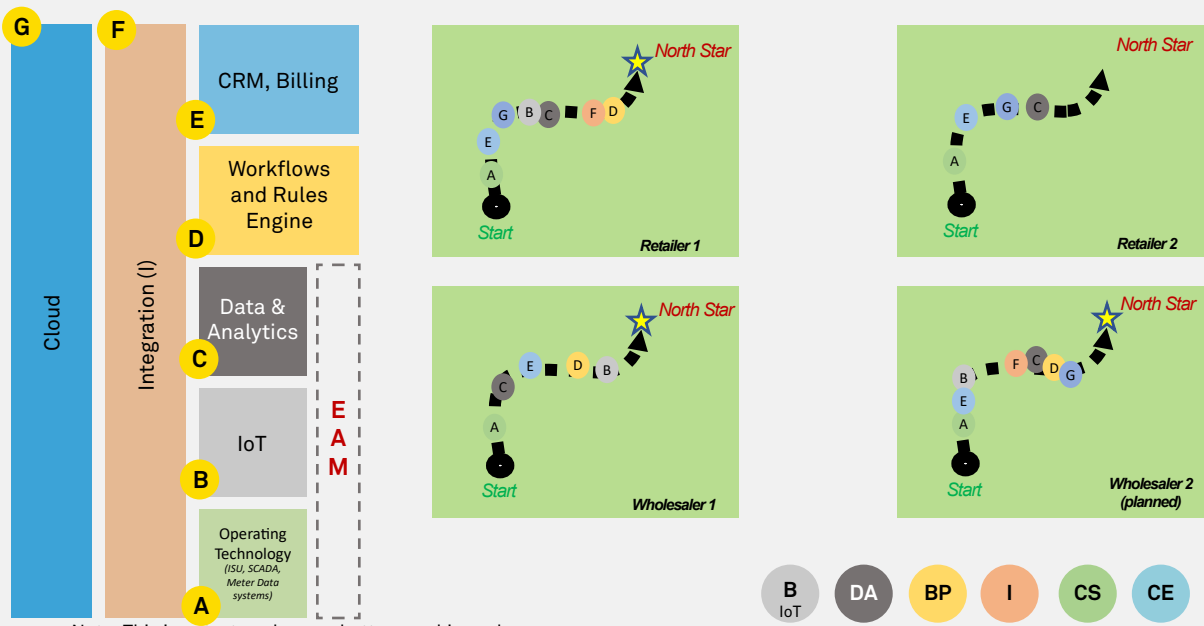
Bringing all of these together are the integration layers which enable processes and data integration across use cases, devices, applications and channels.

Finally, all of these are underpinned by cloud transformations where utilities are seeing massive value by migrating their technology estates and operating them from the cloud. Their cloud modernisation programs are giving them incredible leverage to bring together all the other components of the pattern seamlessly and intelligently.



Water utilities tend to invest in technology in different sequences

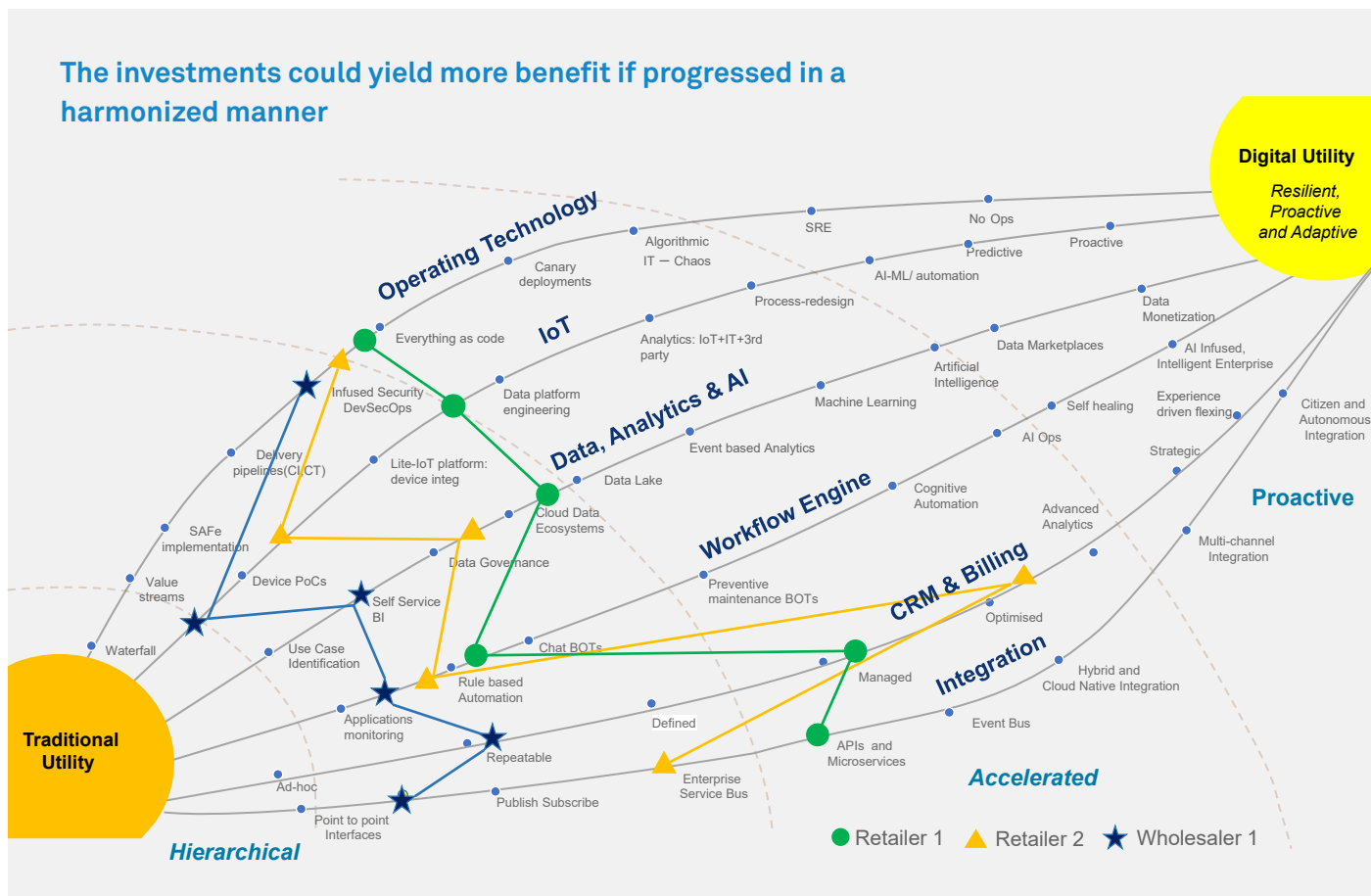
While the sequence may differ, we see them completing the same technology pattern



Note: This is not a top-down or bottom-up hierarchy



However, our key observation is that while water utilities are moving across this technology pattern and completing initiatives in each of these layers, they are not following the same order to complete the pattern. The insight here is that the order in which they complete the pattern has an impact on the use cases that they are able to implement and thereon the business benefits that they are able to realize.



Same technology pattern, but different sequences

Ultimately, we are seeing water utilities articulating visions of becoming digital utilities and transforming from their traditional ways of working to Agile nimble technologically savvy ways of working. However, most of them seem to be investing in one layer of the pattern or two at a time and then moving on to other layers. The challenge we see is a lack of harmonized progress in maturing their organizations across this technology pattern.

Consequently, these organizations often end up getting skewed value or return on investment from these initiatives.



The investment sequence has defined the value delivered from use cases

The sequence of maturing/ investing in technologies impacts the use cases that can be delivered

Pattern Element / Use Case Examples	ISU, SCADA, Meter Data Systems	IoT	Data & Analytics	Workflows and Rules Engine	CRM, Billing	Integration	Cloud
Bill Shock Prevention	25-50%	25%	75%	75%	100%	25%	25%
Predictive Asset Maintenance	100%	100%	75%	50%	0%	75%	25%
Leakage Analytics	50%	50%	100%	25%	0%	25%	25%
Digitize Critical Assets & Network	50%	100%	75%	25%	0%	50%	75%
Centralized Sludge Monitoring	25%	75%	50%	0%	0%	25%	25%
Real Time Water Quality Monitoring	25%	100%	25%	25%	0%	25%	25%

For example, we are seeing the utilities that are investing significantly in CRM and billing without harmonized investments in other elements of the pattern are unable to move the needle significantly on predictive asset management, water quality monitoring, digitizing critical assets, workforce management and safety. Conversely, organizations, which have first invested primarily in IoT are being inundated by data streams from these devices – a CIO remarked that his team was getting more data from a smart meter in a day than they would receive earlier in an entire year. His team were struggling to leverage that data as their maturity in analytics was not in step.

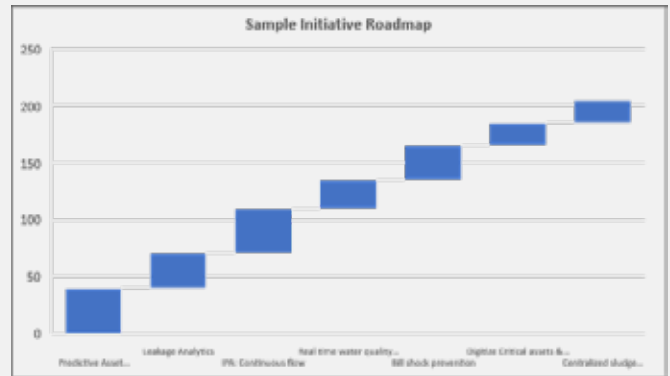
How to harmonize technology investments

The secret sauce here is the ability to invest precisely in key elements of the pattern to a point where we harmonize the utility's progression across the pattern. This will enable a targeted set of use cases and release business value which could subsidise future investments.

How to harmonize investments to create a self-sustaining transformation roadmap

- Selective investments in key elements of the pattern will enable a targeted set of use cases and release immediate value e.g.
 - Utility A is well advanced on Analytics and CRM. Deploying Intelligent Process Automation (IPA) will enable a 'bill shock prevention' use case and improve CSAT by 25 points
 - Utility B has already invested in IoT. Deploying the right data architecture will enable predictive asset management and potentially save \$20m/yr
 - Utility C can enable the below use cases by enabling IPA and Analytics
 - Leakage analytics (savings of \$15m/yr)
 - Continuous flow (decrease repair costs by \$10m/yr)
 - Centralized sludge monitoring (decrease maintenance costs by \$10m/yr)

Use case	Timeline	Cost (\$m)	Illustrative 3 yr benefit (\$m)
Predictive Asset Maintenance	12 months	20	40
Leakage Analytics	6 months	15	30
IPA: Continuous flow	6 months	10	40
Real time water quality monitoring	3 months	15	25
Bill shock prevention	6 months	15	30
Digitize Critical assets & Network	12 months	10	20
Centralized sludge monitoring	6 months	10	20



So, it is important to plan the right sequence of investments to enable new use cases. The key here is to focus on investing in the pattern in such a way that releases high benefit use cases early and the benefits from these use cases can partially or completely fund subsequent use cases. It should be noted that there will be some projects with little value or benefits that will need to be implemented first as foundational pieces. With this approach, the utility's digital and technology leadership teams should focus on creating roadmaps from 36 to 60 months articulating a clear program of work that will release tangible business benefits and create a partially or even completely self-sustaining initiative.

A series of strategic design thinking workshops will be key to define a self-sustaining roadmap

01

Weeks 1 - 2



Validate and Prioritize business goals

02

Weeks 3 - 4



Plan and Sequence investments

03

Weeks 5 - 6



Shape the Digital Roadmap

Such a roadmap would require a clear prioritised translation of the utility's business goals and to make hard choices in the process. Customer experience and sustainability are important filters for the prioritisation. This will then be followed up by business benefit driven investment planning to sequence use cases. Next come the underlying technology, team capability uplifts and the level of maturity required in each layer of the pattern to enable these use cases.

Finally, this will be followed up by sequencing the use cases in a manner where sequential dependencies are identified upfront, resources are called upon, committed and released gracefully as the initiative progresses.

We can help you plan the right sequence of investments to enable new use cases and unlock value to create a self-funding, perpetual transformation initiative. [Contact us](#) for details.

About the authors



Ashok Nayak, Business Director, Wipro Digital

Ashok has worked with boards and CXOs to shape digital transformations and led delivery of significant benefits. He has coached and led teams focused on water utility transformations to ensure true business value. This includes an end-to-end digital transformation for a water wholesaler, partnering with a water retailer to drive a multi-year transformation across their human experience, Workflow, Integration, Data, Cloud and IoT.

He leverages over 25 years of experience across digital, strategy consulting, automation and outsourcing to shape and execute transformational engagements.



Meher Vanama, Solution Leader, Wipro Digital

Meher has deep experience in Digital strategy, Business Design, Product Development, Business Analysis and Scrum leadership. He is skilled in bridging gaps between work streams, breaking silos and translating human experiences to technical specifications.

Meher helped shape and launch a transformation for a major water wholesaler in NSW, injected digital innovation in a water wholesaler, executed integration POCs for an integrated water utility and setup a Centre for Digital Excellence at an oil and gas major in Malaysia.

References

¹ The 2030 Water Resources Group

² American Water Works Association survey, April 2020

³ WaterWorld paper, March 2020



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