
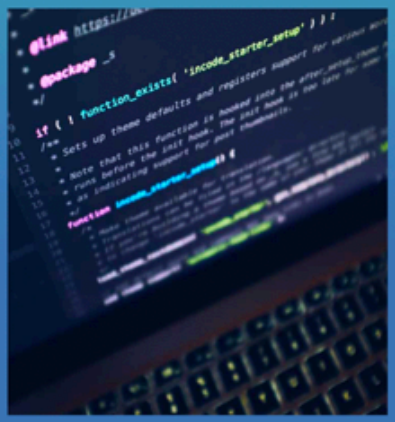

Providing a transformational ecosystem for the water industry

THE WATER TOWER

GLOBAL INNOVATION HUB @ GWINNETT

Providing a transformational ecosystem for the water industry through social engagement and technology demonstration

Prepared by:
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Introduction

Just as water is critical for life, the water sector is a vital component of economic prosperity for communities. A safe, reliable and efficient water supply allows for growth, encourages investment, and provides a significant contribution to quality of life. As such, the stakeholders of the water sector – policy makers, regulators, customers, utilities and water suppliers, utility workers and manufacturing supply chain – each play an important role in ensuring that our communities can meet their aspirational goals. Together with technologies, academia and investors, this diverse group contributes immeasurably to the economic vitality of our communities.

Today, however, we face the challenges of sustaining that vibrant economy while dealing with ever-tightening fiscal environments, water resource volatility, climate change and resiliency, the financial and public health impacts of aging infrastructure and meeting the demands of an increasingly digital population.

With 85 percent of water systems in the United States owned and operated by municipal entities,[1] and the fact that water utilities touch virtually every citizen, home and business, the primary burden of sustaining our water ecosystem to ensure continued economic vitality falls to our local agencies. These organizations are willingly taking on the responsibility of solving a global problem at the local level.

To be successful, these agents need support to come together, accelerate the adoption of technology and innovation, and inform and engage the customer, all while becoming increasingly efficient and improving the skills and capabilities of the workforce.

This paper outlines the current demands for innovation in the water sector, describes the needs of its various stakeholders and outlines how the current methodology of incentivizing and encouraging technology adoption falls short. Finally, the paper lists the opportunity for The Water Tower to take a leading role in filling these gaps. Read on to learn about the drivers for innovation and how the Water Tower Global Innovation Hub will help water agencies keep pace with change and capitalize on the benefits of today's technology.

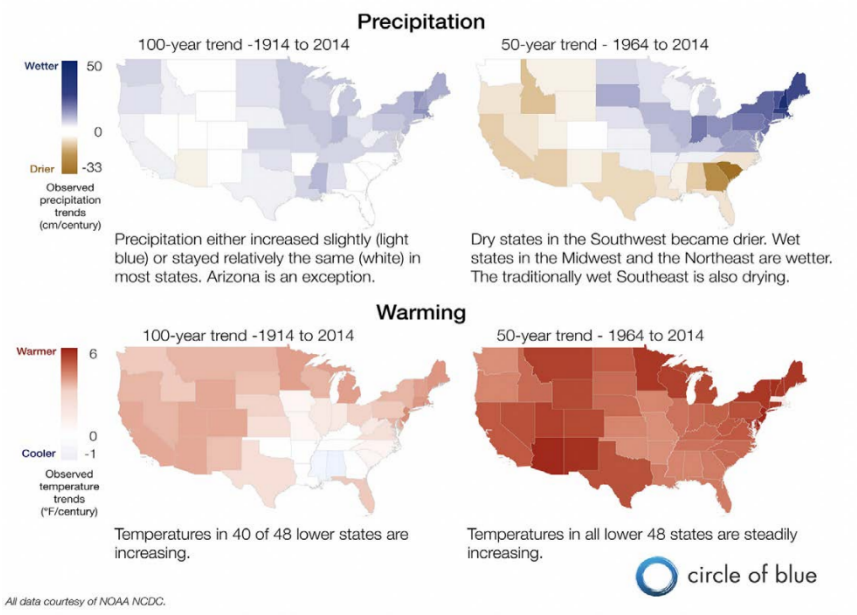
The Drivers for Innovation in the Water Sector

There are several converging conditions that are driving the need for increasing innovation in the water sector. Solving complex resource, quality and efficiency problems requires innovation – access to the tools that can make sense of conflicting information and generate solutions despite multiple constraints. Historically, this type of innovation has not been required (nor achieved) in the water sector. The industry's slow regulatory evolution combined with an environment that was, for the most part, operationally benign, the need to rapid adaption was rarely called for in the water sector. This is not

the case today. The issues facing water stakeholders are varied and racing at high speed. Meeting the challenges listed below will require transformational change within the sector – change that only can occur with the accelerating catalyst of technology.

a. Water Volatility

Most states have seen significant changes in precipitation and temperature patterns over the past 50 years. While the discussions of climate variability usually revolve around temperature and greenhouse gas (GHG) emissions, water is the medium through which the impacts of these changes will be first and most acutely felt.



U.S. Climate Maps: Compared to 120 years of record keeping in the United States, 2014 was particularly wet in the north, cold in the Midwest, and warm along the Pacific Coast, according to maps from the 2014 National Climatic Data Center State of the Climate report[2]

The water sector is in a unique position with respect to managing the effects of this climate volatility on our resources. Not only are our water utilities on the front line of the major effects of an increasingly warming world – water scarcity, reductions in snowpack, changes in the timing and velocity of the natural water delivery systems, increased flooding and storm activity – they also make significant contributions to GHG emissions due to the energy required to move water around.[3]

b. Aging Infrastructure

Our municipal infrastructure is aging. While bridges, highways, roads, and buildings decay before our eyes, our buried infrastructure is dying invisibly. Our constructed water and wastewater infrastructure have served us well for many generations and can be credited with much of the economic success our cities enjoy. However, it remains invisible to inspection and often invisible to investment.

The result is that our aging water and wastewater infrastructure is at a crossroads, creating the potential for dramatic disruption as these vital systems reach the end of their useful lives.

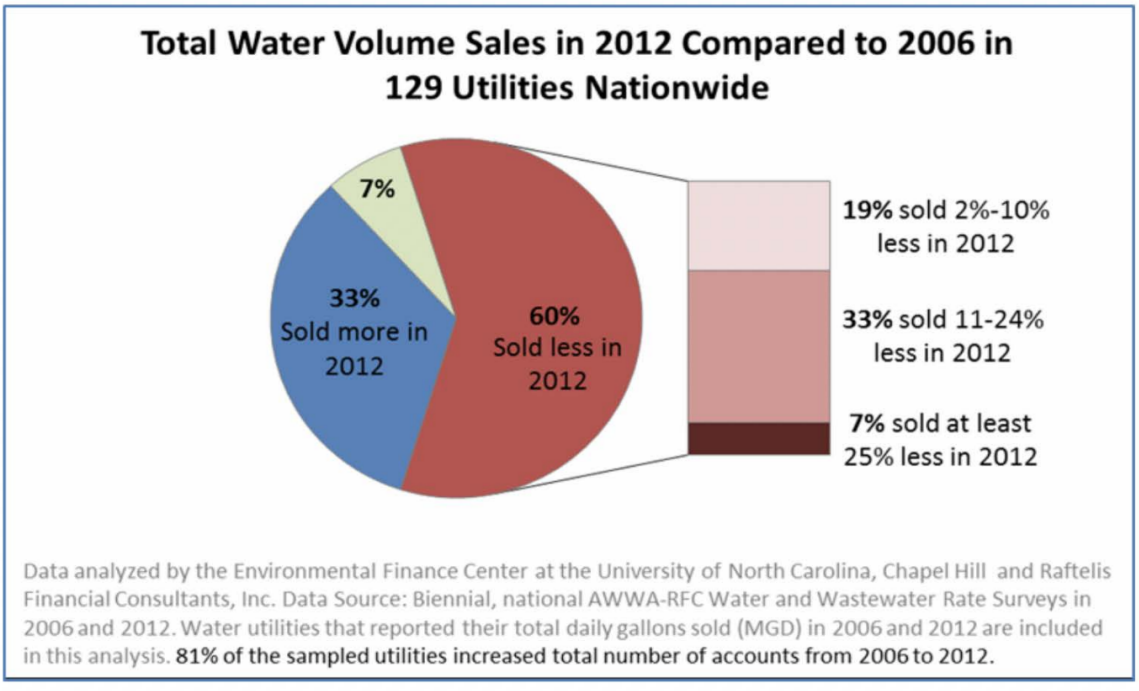
The explosion of news with respect to the lead crisis in Flint, MI, and the stormwater issues across the U.S. are bellwethers of this condition. In response, we can expect that the regulatory agencies across the country will begin to demand assessments of water quality throughout the distribution systems and continue to seek billion-dollar consent decrees related to stormwater management.

Within this challenge, however, lies an opportunity. As our infrastructure ages, we are being afforded an opportunity to reimagine an integrated water supply system for cities. Concurrent with this, however, is a requirement to derive more capacity from existing treatment systems; to use information to manage pressure transients to control bursts; to use technology to eliminate wasteful non-revenue water; and to maximize the economic potential of our existing infrastructure.

c. Increasing Costs and Decreasing Revenue

Utilities are faced with the same economic pressures as any business. Costs are continually increasing – power, labor, chemicals, pumps, pipes, fuel – and are biting hard into the generally fixed budgets of our utilities. With new infrastructure demands from repair and replacement programs and increased regulatory oversight, our utilities are facing increasingly harsh budgetary realities.

Coupled with increasing costs is the fact that revenue for water utilities is actually declining faster than increasing rates can match. Despite the reality that water and sewer rates are increasing at more than twice the Consumer Price Index (CPI), our utilities are still losing ground.[4]



This is a result of several factors, including:

- **Voluntary Conservation.** Our customers are becoming increasingly aware of water issues and often are actively reducing water use.
- **Structural Conservation.** Increasing fixture efficiency – low water use toilets, water efficient evaporative coolers, faucet aerators – along with dedicated commercial/industrial efforts to reduce water footprints and increasing agricultural efficiency are all driving lower consumption numbers for utilities.
- **Regulatory Conservation.** During California's drought emergency, requirements that water suppliers reduce demand from their customers caused water utility net revenues to "decrease between $500 and $600 million".[5]
- **Rates.** Typical water rates are heavily skewed to volumetric billing driving large reductions in revenue when costs are pushed into the elastic zone and consumption decreases. In other words, water rate structures that provide discounts to large users can increase demand while eroding revenues, undermining a utility's profits and demand management.

In an environment where water remains the most capital-intensive utility business in which to operate[6] the decline in revenue has a stark impact on our ability to invest in our systems.

d. Increasing Customer Expectations

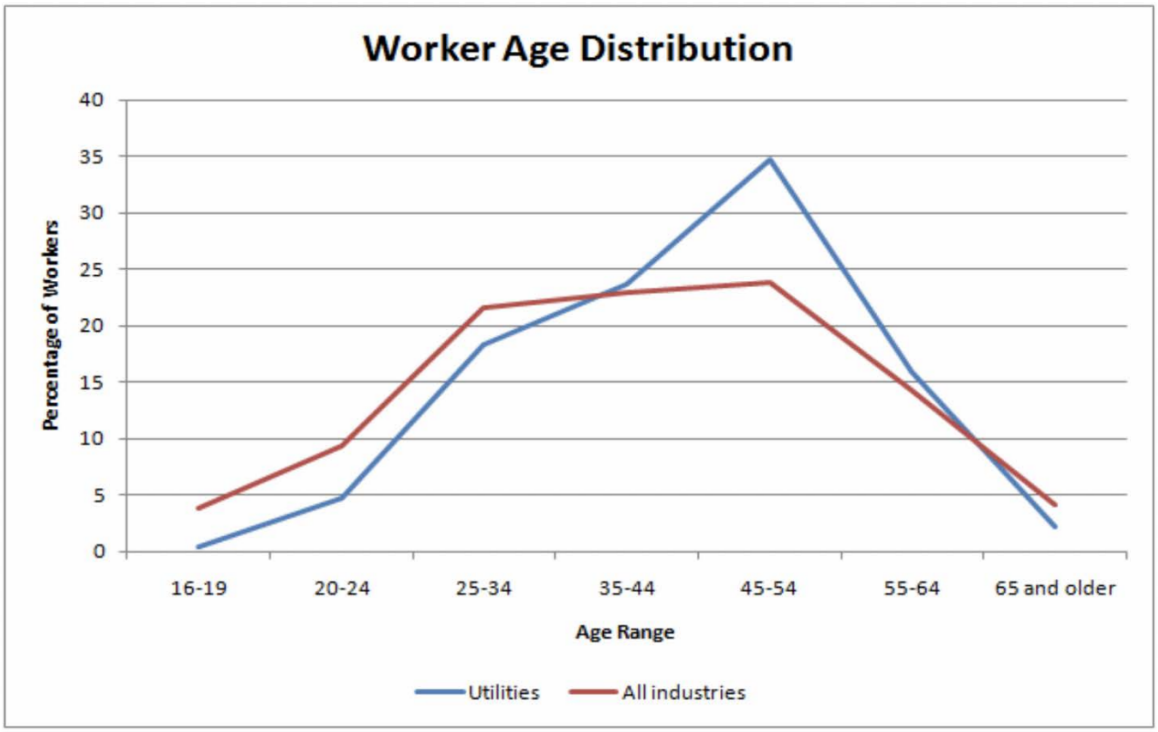
Customer expectations for water utilities are set not by comparisons to other water utilities, but to banks, airlines and retail and on-line shopping experiences. Therefore, for those utilities that aim to delight their customers, apart from providing them with exemplary service they must model their on-line presences and transactional capabilities against these enterprises to guarantee a positive customer experience while providing a rapid and intuitive customer journey.

In the past, a utility would communicate with its customers only with a bill. Today, customers expect their utilities, banks and other service providers to push information to them, providing a bespoke experience by allowing the customer to select when and how they are contacted while providing detailed, relevant and timely information at their fingertips and phone screens.

e. Aging Workforce

Utilities are losing corporate knowledge at an alarming rate. Overall, the utility workforce is aging. Nationwide, 22.5 percent of utility workers are at or above the age of fifty-five.[7] For the water sector, however, the problem is more acute with 70 percent of states indicating that the percentage of water employees at or above the age of fifty-five is greater than the national utility average.[8]

In addition, the overall age distribution of utility workers is significantly skewed as compared to the workforce in general, with a larger proportion of the industry moving into retirement age.



This represents a significant challenge for utilities: how do they retain and store a generation's worth of knowledge about systems, so that it remains available and easily accessible? The problem is exacerbated by the fact that the operation of water systems is a knowledge-based industry that necessitates significant training and experience to be effective. As noted in a recent C. D. Howe report on ensuring public safety:

> The first step is to recognize that providing safe drinking water is a knowledge-based activity. This activity cannot be downloaded to the same level of municipal priority as garbage collection and snow removal. Those assigned to provide drinking water have to be afforded the training, intellectual support, and compensation that is commensurate with taking responsibility through their actions or inactions for the health of an entire community.[9]

Ensuring that operations staff members "know their systems" is a critical facet of the provision of safe drinking water. Maintaining that knowledge will be an ongoing challenge for utilities.

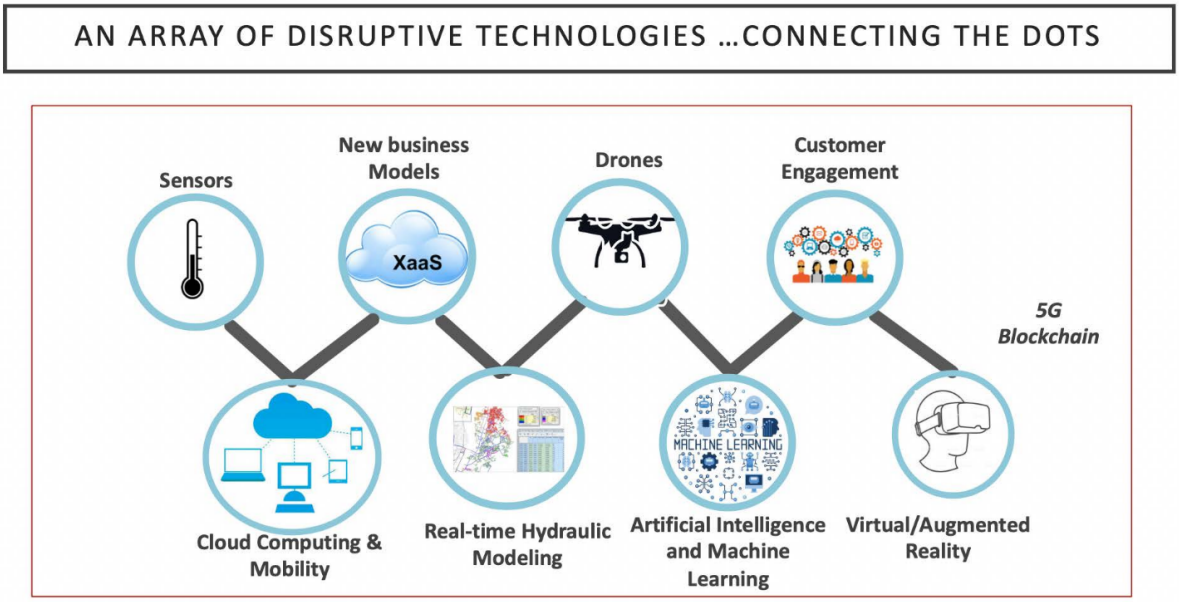
f. Increasing Need for Holistic Utility Management

Historically, our utilities have been seen as technical enterprises, populated with specific jobs and functions necessary to achieve the mission. The reality is that the utility operates as an entity integrated not only within its own structure, but also within the municipal estate and as a customer service organization. The dynamic and changing operational structure and need for increasing visibility means that we must bring the utility's internal systems together while also increasing connectivity to the entire city. At the same time, they must change from an inwardly-focused, insular organization, to a customer-centric one.

Examples of this include having full visibility of all assets and activity across the utility; using both real-time data as well as historical data to identify issues; integrating all asset tools, business tools, work order systems into an enterprise-level command-and-control system; and improving overall customer experience through both transparent engagement and the delivery of cost-efficient, reliable services.

The result is a holistic management approach that efficiently provides for operational support, system maintenance, capital planning and execution, and continuous improvement.

An array of disruptive technologies is available to improve the way water utilities run their operations and engage with their customers. These include enhanced data collection and storage, Cloud and edge computing, machine learning, Internet of Things (IoT), drones, virtual reality, and new business models surrounding XaaS (anything as a service). The application of these technologies in the water sector has helped to transform some utilities from a data-rich environment to an increasingly knowledge-rich environment.



Water Innovation Inhibitors

While the needs for technology-assisted solutions to the sector's problems are clearly evident, the path to the solution remains clouded. The water sector has a historical predisposition to risk aversion that was founded in the reality that there are definite public health consequences associated with their work. The result is that the industry has unfortunately lacked the advances in technology, data and analytics that have revolutionized commerce, airlines, financial institutions, political campaigns and a host of other industries. Limited capacity in data acquisition, and the tools necessary to curate and analyze that data have hindered the use of "big data" in water. However, with the availability of advanced metering infrastructure (AMI), rapidly decreasing cost of sensors, and the availability of massive data sets, including weather and climate, hydrological, and remote sensing information, water utilities now have a significant opportunity to expand their data footprint.

To realize this, however, utilities require a data infrastructure that:

- Provides a place for that data to land;
- Provides a curation mechanism for that data; and
- Provides the means to analyze that data.

Other specific impediments to technology innovation in the water sector include:

a. Technologies in Search of a Problem

Water utilities often are approached with technologies in search of a problem. That is, while there are "cool" technologies out in the world, not all can be applied in the water sector. In an industry where access to capital can be highly constrained, and investments are made on a decadal timeframe as opposed to, say, the consumer electronics industry, where cycles can be as fast as semi-annual, the industry rarely can afford to invest in technology that does not meet a pressing need in the utility.

b. Fitting Technology into the Utility Landscape

Similarly, while some utilities are blessed with modern data architectures and applications, the majority are typically running versions of software that are several iterations behind. This makes integration for new technologies difficult and increases the deployment and maintenance costs. Understanding the utility data and technology environment is critical to successful technologies.

c. Technology Often Does Not Address the Entire Problem

For example, a water quality sensor may be key to understanding the compliant delivery of water to customers, but lacking a communication and integration to Supervisory Control and Data Acquisition (SCADA) and Laboratory Information Management System (LIMS), a recognition of the sensor analytical method vis-

à-vis laboratory testing, an understanding of the utility's obligations under the Safe Drinking Water Act and an ability to drive process control changes from such data, the technology is interesting but likely to fail.

Technologies need to address entire verticals within the utility's business processes or have the potential to be ganged together with auxiliary and ancillary technology to do so to become successful.

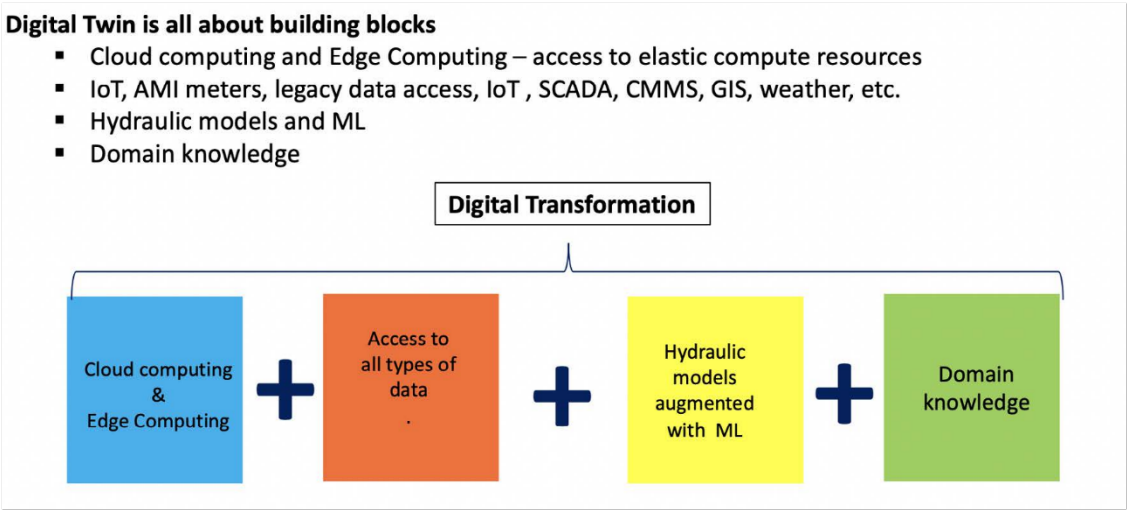
d. Lack of Open Interfaces and Middleware for Integrating Systems

Water utilities are now dealing with large volumes of data that comprise both structured (easily searchable types) and unstructured (video, satellite images, social media, etc.) data coming from disparate sources. Most utilities say that accessing data from legacy systems is a continuing challenge. The key to maximizing the use of big data is the ability to access the right data when it is needed by the applications.

Overall, there is a lack of application programing interfaces (APIs) for technologies in the water sector. APIs provide a programmatic way for retrieving data from a dataset by any software application. Once developed, these APIs can serve data from existing legacy systems, sensors, and other applications regardless of data location for use by a variety of software applications.

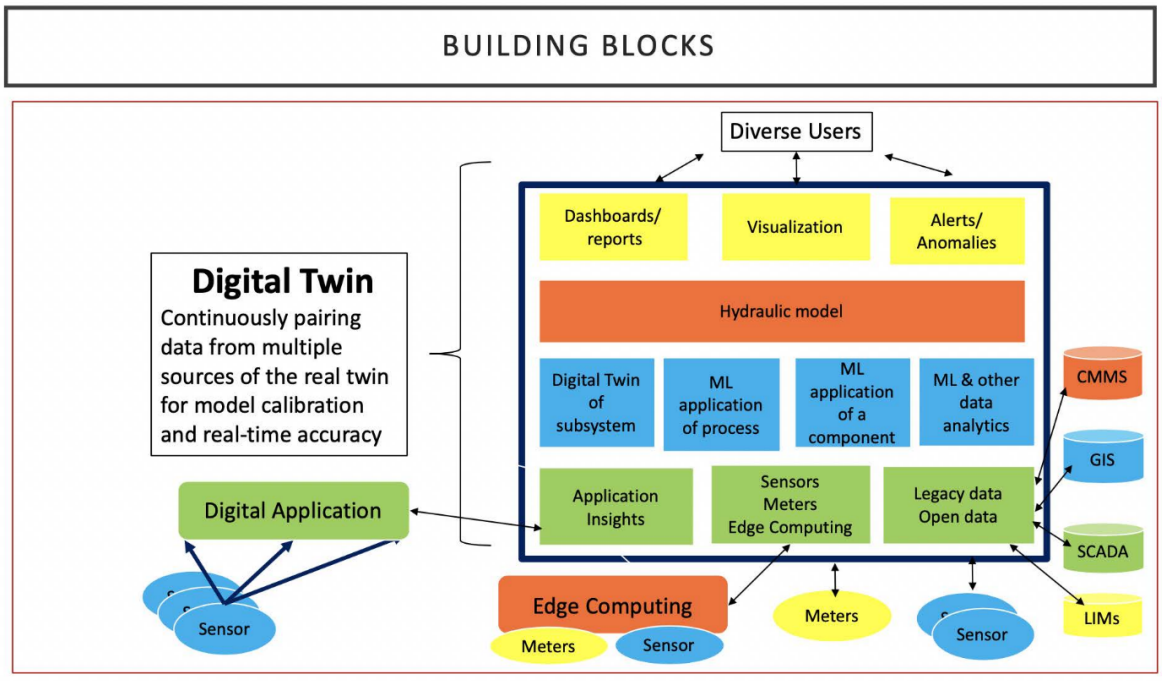
e. Water Sector's Lack of Access to Digital Twin Systems

Digital Twin technology provides for a software-based simulation of a physical system. Today, Digital Twin technology is used in all industries, ranging from manufacturing and medicine to transportation and utilities. The water sector has been slow to realize the benefits of Digital Twin technologies primarily because they lack the building blocks necessary to do so, as stated above. As a result, this technology has not been adopted until recently.



Many utilities have been increasing the rate of adoption of digital technologies, such as IoT sensors, cloud computing, and machine learning applications. These foundational technologies form the building blocks to change the way we use data and have set the water sector up for the potential of a Digital Twin revolution.

The Digital Twin becomes an integration platform that unites data from legacy systems and new digital solutions, providing a holistic view of operations. The Digital Twin can be used to run "what-if" scenarios, predict and prevent failures, provide early alerts of anomalies and conduct predictive analysis. An example of a "what-if" scenario is when a field worker finds a leak in one of the pipelines in a distribution and is trying to decide the most cost-effective way to bypass this part of the pipeline. She can use the Digital Twin to try out different bypass routes to see which path provides the least impact on customers. If the Digital Twin includes the chemical treatment process, operational personnel can run a simulation using a new chemical input and see the impact on water quality at different parts of the distribution to determine how to proceed.



Structural Hurdles for Technology Adoption

a. The Invisibility of the Water Industry

With the majority of water suppliers being municipal entities, getting public acceptance for expending financial resources requires visibility. Unfortunately, with our water and wastewater infrastructure,

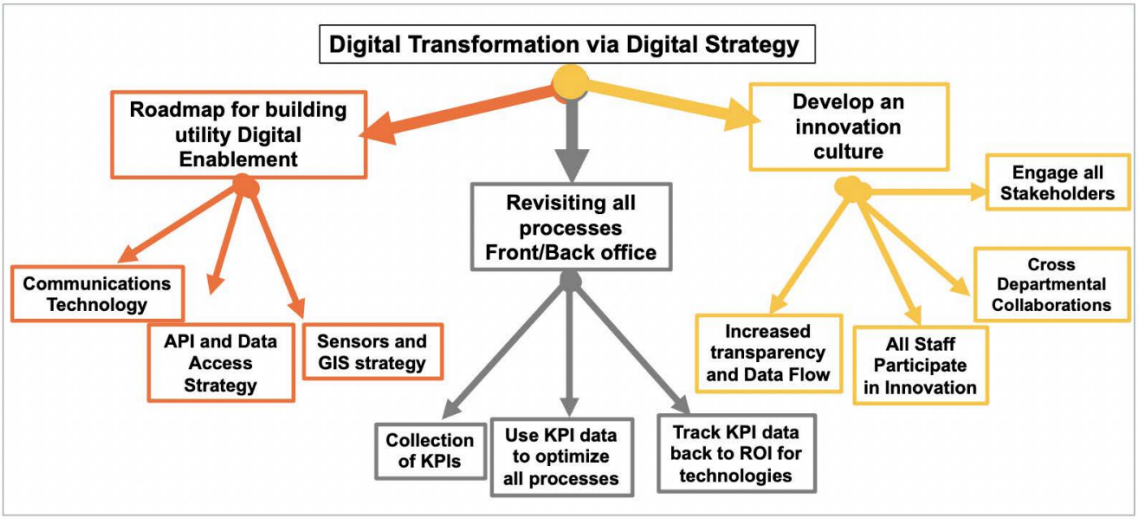
the majority is out of sight and out of mind. In many cases even the investment for improvement is ultimately buried. The challenge to the industry is to devise methodologies to raise awareness and demonstrate the impact of investment – even when it is invisible.

b. Risk Aversion

When making potable water, treating wastewater, managing stormwater or delivering recycled water, we cannot lose sight of the fact that each of these services carries with it the burden of public health. Our utilities are truly "public health agencies" and it is for good reason that there's no prize for placing public health on the line with untried technologies.

The result is that the industry is follower based, relying on tried and true technology. Developing strategies that allow for innovation but align with the utility's public health mandate are critical to encouraging innovation.

c. Lack of an Innovative Culture



The implications of risk aversion also mean that, historically, utilities have not invested in the creation of an open-innovation culture. Successful digital transformation of water utilities has often had three simultaneous characteristics or a three-pronged approach to digital strategy:

- A well-conceived, evolving digital infrastructure roadmap including communications and data storage, curation and access.
- A utility-wide process improvement program where staff can determine key performance indicators and determine where inefficiencies lie.

- The development of an innovative culture complete with strong leadership, strong participation and strong interaction.

d. Lack of Cross-departmental Collaboration and Information Transparency

Silos exist in all industries, and the water sector is no different. Complicating the insular nature of the sector is that technology adoption is typically driven by a specific issue for a specific department. That means that a SCADA system – an operational platform – will often not be able to communicate with a hydraulic model system – an engineering and planning system.

Managing the interfaces is key for technologies. Having a robust methodology for data transfer and establishing a universal data model are key elements of technology adoption for utilities.

e. Lack of Coherent National, State and Regional Policies

The water utility industry is decidedly fragmented. According to the EPA, there are more than 52,000 community water systems in operation in the United States,[10] with 92 percent of those systems serving less than 10,000 people.[11]

The reason for this fragmentation is obvious: water is extremely heavy and bulky to transport and is incompressible in its liquid state. These physical properties of water preclude many of the consolidation benefits that electric, gas and other utilities have when dealing with resource supply and delivery efficiency. In the water industry, it has always been easier to build new utilities, close to the demand, than to consolidate production and distribution infrastructure.

In addition, the fragmentation and local nature of water has prevented – except in the case of water quality – the development of effective policies and regulation as it relates to their operation.

f. Lack of Standards – Data Standards

The sector fragmentation leads to a lack of standards with respect to data and technology. While there are certainly standards associated with water quality, engineering and construction, from a data perspective architectures and data formats are many times unique to specific utilities.

This is a particular challenge for technologies seeking to integrate any data or analytics-based solution to utilities.

g. Lack of Reciprocity – Jurisdictional Bias

Often there is a lack of reciprocity between states, and often within primacy agencies within states when it comes to technology approvals. As a result, technology providers must seek approval in each jurisdiction, substantially increasing costs and delaying adoption nationally.

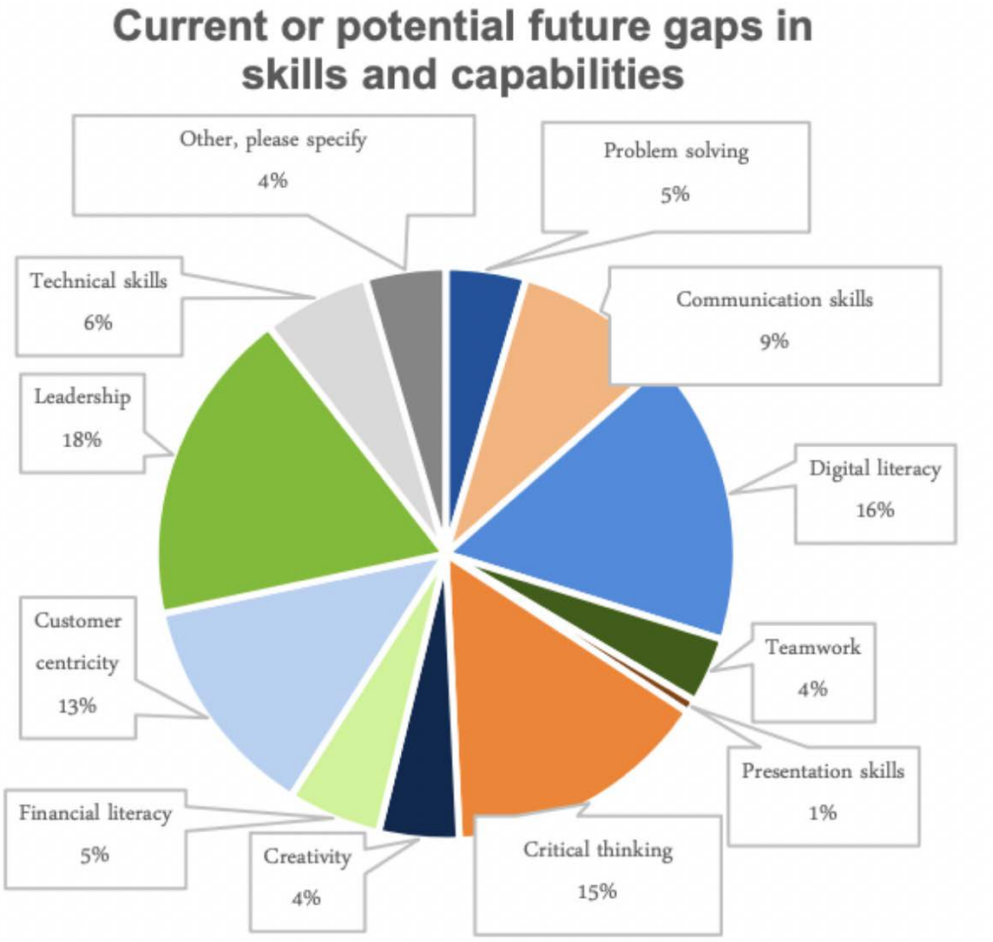
h. Aging Workforce, Lack of Skills and Knowledge

Thirty-seven percent of water utility workers and 31 percent of wastewater utility workers are set to retire in the next 10 years, according to the Task Force on Workforce Sustainability. Many of these retirees will be replaced by a new generation of workers, who've grown up with digital technologies.[12]

With the changing technological vision of our utilities, and the pending demographic shift in workers, utilities that invest in technology innovation will increase their opportunities to attract and maintain a new workforce that has matured with technology and data at hand.

Notwithstanding, there is continual need for improving the introduction of technology to workers in the water sector, and a need to educate, encourage and employ the workers of today and tomorrow with a broad range of skills.

A recent Water Services Association of Australia (WSAA) study identified current and potential future skills gaps including digital literacy, leadership and critical thinking.[13] Providing workers with these skills will be critical for the workforce of the future.



i. Lack of Access to Funding

The majority of utilities operate as cost recovery entities – that is, they are typically structured so that revenue (via rates) is sufficient to cover operating expenses and to provide some (minimal) capital investment.

When seeking capital for improvements or for investment in technologies, utilities typically turn to programs like Water Infrastructure Finance and Innovation Act (WIFIA) or municipal bonds. Competition for WIFIA funds can be fierce, with typically little funding available for innovation. Municipal bonds offer an opportunity to access low interest money, but they are cap limited and depending on the financial condition of the utility, rates may need to be increased to cover debt service obligations.

The reaction from customers is typically outrage leading to packed council chambers or utility commission hearings.

Further, the data suggests that more often than not, there is not a one-to-one relationship for rate-to-revenue increases. In many cases, revenue increases significantly lag rate increases (both in time and effect) and a successful rate proceeding is not a guarantee of revenue recovery.[14]

And as costs of water increase as a percentage of monthly income, water utilities are pushing into the "zone of elasticity" for water prices, where further increases in customer costs result in declines in consumption further impacting revenue. As a result, utilities often cannot dedicate significant capital reserves to invest in the development and/or deployment of technologies.

Needs of the Water Ecosystem

The water sector is populated with a number of stakeholders with common but oftentimes competing needs, perspectives and objectives. Water Tower offers the unique opportunity to align these agencies:

a. Policy Makers

Policy makers Have a responsibility to make sure communities have safe and sustainable drinking water systems. The decisions they make and actions they take regarding drinking water will impact the people, businesses and ecosystems for decades.

Policy makers need to understand that technology typically leads policy and that policy drives technology adoption.

It is critical that policy makers have the knowledge to encourage technology adoption by utilities.

At the end of the day, policies supporting full water accounting and reporting will support a Smart Water installation. Policies that require limitations on water loss, or best practices to maximize efficiency also help. From a hindrance perspective, policies that limit the collection of data from consumers – even in the face of compliance with privacy laws and data security requirements – could stifle the deployment of Smart Water technologies.

b. Regulators

Both economic and technical regulators need the knowledge to develop regulations that incentivize the correct behavior. Balancing the risk-reward scale for water technologies means understanding the impact of technology on public health, operations, rates, etc.

Smart Water is really about optimization of resources to provide a safe, reliable, sustainable and cost-efficient service for customers. Those resources could be water itself, or the labor associated with producing and delivering that water, or the power, chemicals and other consumables required to deliver it.

From a customer perspective, the price of water is increasing – just by virtue of the general increase in labor and consumables costs. Add in the requirement to replace aging infrastructure, physical water scarcity, declining quality, increasing regulatory requirements and a requirement that municipalities balance their budgets and we can see that prices will be escalating for some time at a multiple of (Consumer Price Index (CPI).

c. Customers

Customers need to understand what they are paying for and how it impacts their water quality and environment. As consumer costs increase, and the price crosses the “care point” for consumers, they will begin to demand information on both their water use and how to control costs. They also will demand that regulators and city councils impose performance metrics on utilities to reduce the scale of rate increases. In short, utilities will be driven to be more efficient, and consumers will be driven to use less water.

d. Utilities

Utilities want to lower costs, mitigate risks and increase operational efficiencies.

e. Utility workers

Need to stay current on best practices and adapt to digital operations while being able to take advantage of technology to enhance their career opportunities.

f. Technologies & Manufacturers

Technology providers and manufacturers need to understand the drivers for innovation within the utility estate, and to ensure the data they need (or that their systems generate) can be integrated into a utility's operations. Further, they need to understand the day-to-day requirements of the industry and focus on solving entire verticals versus providing widgets.

g. Investors

Investors need to understand the drivers for innovation and the impact of their investments. They also need to see the technology adoption curve shortened – or even short circuited. An overnight success in the water industry is typically 20 years in the making, which has historically reduced the appetite for investment.

The Current Landscape

The current methods and systems for water innovation are typically centered around accelerators, innovation hubs, research organizations, industry organizations and consulting engineers. While these organizations can offer a catalog of technologies, they are often tightly regionally, sector or technology focused. As a result, they can often act as technology gatekeepers as opposed to technology gateways.

Furthermore, once deployed into the utility estate breaking technologies out of the "R&D System" into the mainstream utility ecosystem is challenging as each utility tends to seek pilots of technology despite having been proven in other regions.

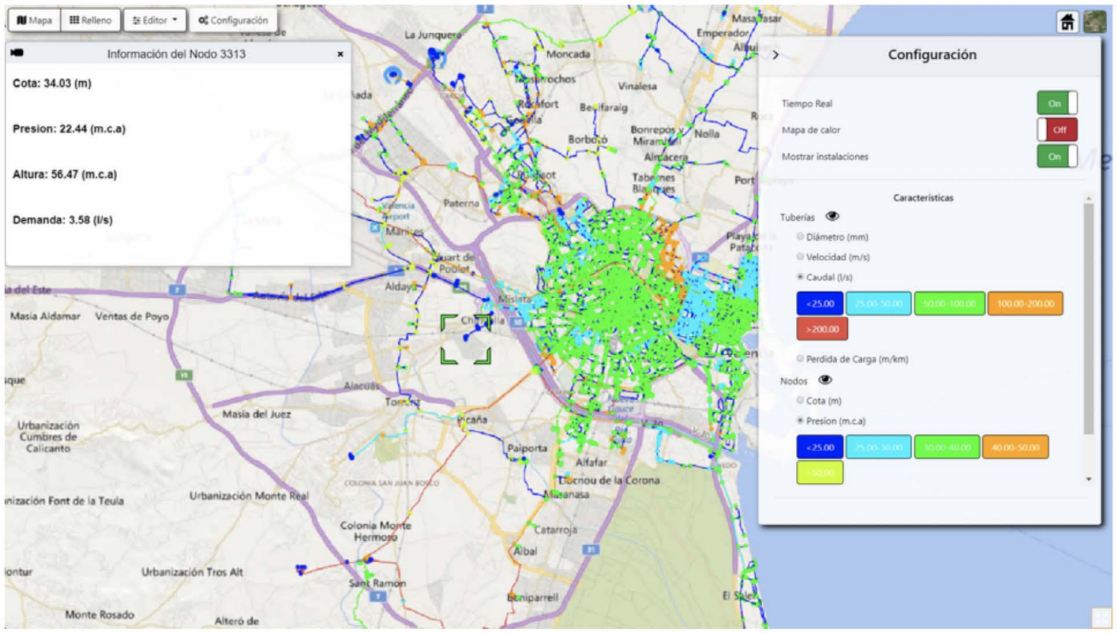
Complicating matters is that the industry relies on "representative sales" which tends to limit a utility's exposure to potential technologies and demands that technologies develop that representative relationship.

Digital has Created a New Opportunity

The breakthrough or "Moneyball" opportunity with digital technology is one of improved efficiency, reduced costs, improved performance from existing assets and safe-guarding the community's health and economies. The avoided costs and tangible savings that accrue to utilities who have undertaken digital transformation have proven sufficient to more than cover the cost of the investment in digital technologies:

- Crested Butte, Colorado used $100,000 in sensors to forego a $10 million, 10-mile pipe replacement.[15]
- San Antonio Water System used smart sensors to cut 94 percent of its cleaning requirements and extend the life of its assets.[16]

- Spain's GoAigua's Digital Twin leak detection solution at Hamad International Airport in Doha, Qatar, resulted in a 60 percent reduction in number of leaks and 20 percent reduction in maintenance costs. The same Digital Twin solution is used in the major Spanish city of Valencia, with a population of almost 800 thousand. The city is currently saving more than 4 million cubic meters of water each year and has reduced its leakage losses by 18 percent.



Hydraulic model of the network of Valencia and its Metropolitan Area

With such significant opportunities, one might wonder why the industry hasn't already undertaken a digital transformation. The reason is there is no incentive for utilities to do so, no model and no water technology marketplace or showcase for digital water technologies.

This is where The Water Tower can shift the trajectory for our nation and our municipal leaders. By curating, showcasing and demonstrating the impact of digital technologies, The Water Tower will provide the evidence essential for visitors to see a brighter future.

And, with the deployment of a digital modeling capability, The Water Tower will enable any utility to make the case for digital transformation.

The Water Tower can solve many of the issues associated with technology adoption in the water space. Notably, the Water Tower can take the lead in demonstrating the impact of digital transformation and the integration of data platforms and systems by:

- Showcasing case studies, models and heroes from around the globe

- Providing a Data Exchange Gateway or API marketplace
- Bridging technology silos and beginning the path to data standards
- Exploiting the capabilities of AI, Digital Twin, Neural Networks and Machine Learning to ingest and analyze unstructured data
- Opening data for third-party developers

The Water Tower Illuminates a Brighter Future

As The Water Tower platform has the opportunity to integrate all segments of the water sector, the platform has the potential to become the go-to place for water data and information providing the following benefits to stakeholders:

a. Utility Service Providers

The Water Tower provides a central place for utility service providers to experience new technologies that are operating on utility-scale systems on utility-scale problems, rather than at demonstration or pilot-scales. This includes visualization, data integration (CMMS, LIMS, GIS, SCADA, CRM, etc.) and the opportunity to demonstrate the value of digital twinning of systems.

> "Giving utilities the chance to test-drive technologies is a brilliant and much needed resource that can have a transformative impact."
>
> – **Felicia Marcus, Former Chair California Water Board**

The Water Tower can be a significant repository of success stories, case studies, lessons learned and ROI analyses for a vast array of technologies. This information will be invaluable to researchers and industry professionals working on pan-industry problems.

This two-way education opportunity allows technologists to understand the real needs of the service providers and will provide utilities direct access to innovative technologies for future consideration. Ultimately the opportunity to establish new, long-term partnerships between utilities and technology providers will accelerate both innovation and adoption.

b. Utility Workers

The Water Tower offers the pathway to digital transformation for utility workers. Workers across the industry have varying access to the new skills that are required to flourish in the realm of digital water and Water Tower has the ability to provide exposure to and experience with technology.

In addition, The Water Tower can provide specific training and certification for utility workers as they advance their skills.

An exciting corollary to this opportunity is that the utility workers maintain significant corporate knowledge and detailed understanding of the needs of the sector. Informing the ecosystem of these needs, translating them into opportunities and developing new technologies and value propositions from them provides a great benefit to the sector.

> "We anticipate making great use of the Water Tower to educate our water workforce."
>
> – **Brent Matthews, Training Supervisor, Georgia Rural Water Association**

c. The Public

For years, utilities have sought to be invisible. Unfortunately, they succeeded. Now, when looming requirement for massive capital investment is generating the potential for large rate increases, the public's understanding of the complexities of delivering safe, reliable and efficient water service is lacking. The Water Tower platform seeks to address this by offering a place where the public can learn about water, understand the technological and financial considerations that go into delivering a high-quality product, and demonstrate the value of well-capitalized utilities.

By engaging the customer/public with timely, accurate and actionable information, these important stakeholders can be brought into the overarching policy discussions while utilities improve their overall transparency.

The Water Tower can also lead the integration of the customer perspective in technology evaluation, adoption and deployment. This can lead to the development of behavioral science-based activities and processes that encourage water sensitive behavior by the public while generating public support for innovation.

d. Manufacturers

Equipment and system procurement in the water sector is relatively tightly controlled and absent an on-ramp to that process technologies can flounder. As a gathering place for technologies, manufacturers and sales representative companies, The Water Tower can offer opportunities to highlight synergies between these agents and offer a collaborative venue for the development of auxiliary and ancillary value propositions – for example combining an existing technology with new data sources and services can generate a new product for manufacturers.

e. Technologies

Providing access to technologies for utilities and other stakeholders is a fundamental goal for The Water Tower. To facilitate this, The Water Tower offers access to utility-scale systems and problems for technologies. This includes:

- The provision of demonstration sites with access to five sources of water (groundwater, surface water, potable water, municipal wastewater and recycled water) with the possibility of an additional four sources being available.
- The opportunity to integrate utility data platforms (SCADA, CMMS, LIMS, CIS, CRM etc.) with technology systems.
- Access to certified laboratory services.
- Crowd-sourcing opportunities for applied science.

> "To accelerate digital transformation in the water sector, we need a place where utilities and technologists can come together to collaborate, demonstrate, and to validate suitability and interoperability."
>
> – **Amir Cahn, Executive Director, Smart Water Networks Forum**

As a test-bed for technologies, The Water Tower stands as a clearing house of validated technologies. As such, The Water Tower can offer a digital storefront opportunity connecting buyers with technology and technologies with access to data.

f. The Investment community

The investment in technology in the water sector is typically provided by small, niche investors (Emerald Ventures, XPV) or large strategic entities (Xylem, Pentair, Suez). There has not been a significant entry into the water market for non-traditional investors (Google, Microsoft) – primarily a result of a lack of understanding of the complexities and dynamics of the water sector as an investment vehicle. The Water Tower can develop significant outreach to all the investment agencies as a means of incentivizing more diverse investment opportunities.

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