

The Flow of IoT in Water Management

It is no surprise that the survival of humanity depends on the availability of water resources. Water stress has fast become a major cause for concern in various regions, largely due to decreasing freshwater reserves. According to United Nations Researchers, it is estimated that more than 50% of the world's population will be living in water-stressed regions by 2050.

As quoted by the WHO:

“Only 71% of the world's population have access to clean water.”

The cost of lost water amounts to \$39 billion a year and accompanied with the fact that consumers want businesses to do more than pay lip service to environmental issues, companies now need to show real evidence of how they are reducing their impact on the planet's resources, including their approach to water management.

Unlike the oil and gas industry, the water industry is behind with its uptake of digitisation and in the monitoring of networks. With water shortages occurring across some countries there is a real need to better monitor the usage, supply, and treatment of both supply water and waste-water networks. To achieve these goals, the water industry must digitise, and use smart sensors across all areas of its water networks.

IoT has been a pioneer in developing solutions that are rich in monitoring, analytical, and automation features. These innovative features allow industries to optimize operational methodologies, boost overall equipment effectiveness, and automate processes that are generally performed manually.

This topical issue is also particularly pertinent for other water-intensive industries such as manufacturing and agriculture, which use large amounts of water to produce cars, clothing, crops and other vital goods.

While this cutting-edge technology has already projected its potential in the manufacturing sector and other production centric industries, its benefits are now being recognised in utilities. The introduction of IoT into the water industry can lead to increases in efficiency, reduction in pollution from contaminants or waste materials, and more.

IoT – A Smart Solution to Curb Water Waste

Intelligent monitoring is defined as a method which is used to monitor, control, manage and optimize the network by using different computational methods that will provide businesses with relevant tools and information. IoT forms an important part of intelligent monitoring that connects people, places and things using wireless sensor technology.

Having a water system that uses this smart technology has proven to reduce the amount of water that is wasted during agricultural and manufacturing processes, as well as improve the efficiency of water distribution systems and instantly alert companies if toxins or other impurities are detected.

Research has shown that advances in IoT sensors, communications and cloud computing have dramatically lowered the cost of gathering, storing and analysing data, whether this is from specific equipment, such as pumps or valves, or entire processes like water treatment or irrigation, all of which allows companies to go beyond basic monitoring to efficiently access new types of data, at a level of granularity that was not cost effective in the past, especially for small and medium-sized organisations.

“By 2030, the sensor market in water and wastewater networks is predicted to be over \$2Bn (€1 billion)”

As quoted by Sensors in the Water and Wastewater Treatment Industries 2020-2030

IoT in Water Management

Within the water and wastewater network, there are a multitude of points in the system where data needs to be sampled, monitored, and analysed to adequately ensure the correct treatment and process is applied. Some of these 5 areas include:

1. **Storage** - i.e Water level, pressure, temperature
2. **Pipes, Network** – i.e pressure, flow speed, level measurements, leaks
3. **Pipes, Distribution** – i.e pressure, flow speed, level measurements, leaks
4. **Treatment – Supply water** – i.e pH, chlorine, pressure, temperature, flow speed, level measurement.
5. **Treatment – Wastewater** – i.e Pressure, temperature, flow speed, level measurements, chemical properties.

Ultimately, digitising and adding sensors to the water and wastewater networks has significant benefits.

The primary benefits being that:

- They remove the need for maintenance staff to visit equipment as regularly, or to collect samples for lab monitoring.
- They speed up the identification of pollution events.
- They improve the overall efficiency of the treatment plants.

Having multiple sensors connected to the Cloud facilitates the control of essential parameters such as pH and dissolved oxygen levels and simplifies monitoring, as it can be done in real time.

In the manufacturing and energy industries, the adequate analysis, measurement and monitoring of the data obtained from water through IoT sensors is especially relevant. They also allow the reduction of water consumption and avoid waste, thus reducing maintenance and energy costs.

IoT Improves Operations

Water company networks are often vast and predominantly have a lot of their treatment equipment spread out over large areas, IoT provides a unique opportunity to gather data for water management on a far larger scale than was previously possible.

While it is practically impossible to install enough sensors to measure water quality changes everywhere in a network, IoT assists by offering technicians a more holistic view of what is occurring within the system. It interconnects a smaller number of sensors — ones that measure flow, pressure, water level and water quality — and links them together with models to ‘fill in the gaps’ and ultimately provide a complete picture of water quality changes across the entire system.

Using IoT across water networks in this way allows operators to make better decisions about water management, and even automate decision-making to respond to demands in real time, including when and how to operate treatment plants and the equipment within those plants. Having technology that adds this level of precision eliminates many procedures that, until now, have had to be carried out manually.

By using IoT to monitor the chemical, physical, and biological properties in different types of water mediums such as groundwater and mine-impacted water, allows companies to inform better treatment options, in a fraction of the time. Additionally, new techniques for toxin identification and quantification can be integrated into the system for performance analysis. Accordingly, the treatment of large areas with high contaminant concentration becomes possible.

Conclusion

With the help of IoT technology, the water industry can realize benefits that were not possible before.

By harnessing and implementing this innovative solution, water companies, utilities, farmers, and manufacturers of all sizes can vastly improve their water management processes.

It will further allow them to supply the required amount of potable and safe water to end consumers, optimize water treatment processes, and improve the capabilities of their water distribution system.

A New Way of Thinking

Fastcomm's IoT solution is intuitive, reliable, and cost-effective. All equipment fitted with our IoT sensors can be monitored and managed from anywhere, at any time, which frees up manpower and time, allowing employees to focus on more important job responsibilities. In addition, making use of our innovative remote monitoring solution will provide an improvement in real-time control for businesses of all sizes, whether it be for a large manufacturing plant, a solar farm or a water utility.

The Fastcomm solution consists of wireless sensors, gateways and monitoring software, to offer a complete remote monitoring solution for businesses of any size. Wireless sensors can be used to monitor various environmental aspects of a water utility as well as integrate with existing equipment to provide real-time data.

The Fastcomm wireless gateway acts as a communication bridge between the wireless sensors and Fastcomm's cloud based remote monitoring platform known as **Hellothing**.

Through the Hellothing platform you can view sensor information from anywhere, at any time via a computer, tablet or smart phone. The platform can also alert you immediately by email and/or text message if conditions that you set are met or exceeded. The wireless sensor network (WSN) can be expandable from a single local area to a multi-site network with sensors anywhere in the world. The gateway will then transmit the data to the Hellothing platform which allows you to configure, monitor, and manage all your locations, and invariably all your equipment, from one network.

The Fastcomm Advantage

Fastcomm's business is to build technology platforms that empower its clients to digitally transform their businesses and therefore to understand and address the growing needs of their customers. Our mission is to build long-term technology partnerships that help transform companies, allowing them to concentrate on their core business.

We have a proven track record of understanding disruptive technologies and the effect that they have on businesses. We have built platforms in the IoT and OTT technology domains that allow us to connect people, places and things successfully.

The Fastcomm group of companies have been providing solutions to its partners, since 2002. We have offices in the USA, Europe and South Africa, allowing us to produce innovative solutions, utilizing know-how and skills acquired worldwide. Our skilled engineering teams have, over many years, created platforms and building blocks that allow for rapid development and deployment of solutions.

References

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[ResearchGate](#)

[Convergia](#)