



SITUATIONAL ANALYTICS

Enabler for an agile and smart Water Utility

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Introduction

Water Utilities are currently faced with the tough task of balancing priorities when it comes to improving customer experience, optimising cost-to-serve, targeting capital spend on replacing ageing assets, scaling up for future growth, and conserving the environment.

While some Water Utilities are addressing this challenge by pursuing the traditional Kaizen principle of incremental improvements, others are looking at innovation.

In this scenario, many utilities are turning towards Situational Analytics as a feasible solution. Situational Analytics offers a Water Utility the choice to either incrementally improve or make a step change of innovation depending on the extent of its implementation and the organisation's propensity to embrace change.

Situational Analytics is a comprehensive awareness of a situation (either in the reservoir, a water treatment plant, a sewage treatment plant, a pumping station, or anywhere across the thousands of miles of the pipes comprising the water network) coupled with analytics used to increase

effectiveness and efficiency of decisions and actions. It is also the ability to rapidly evaluate past trends and present circumstances even as they are changing with a focus on analysing data that is relevant to a particular decision over time.

There are a number of sensors spread across the water network that remotely collect real time data on critical parameters such as flow, pressure, level, acoustics, water quality etc. and transmit this data to centralised systems. Situational Analytics works by accessing and integrating massive volumes of historical, real-time and predictive data from these as well as other internal systems and external feeds, and enables event-based correlations between points of information across space and time in any environment. It provides intuitive visual displays that incorporate all the information needed to identify problem areas, determine the root cause of those problems, and take rapid remedial action to correct them. Advancements in the Big Data technology market have considerably evolved Situational Analytics.

How to use Situational Analytics

Situational Analytics helps organisations reduce risk, ensure regulatory compliance, improve customer experience and lower the cost of operations. In a range of industries and operational functions, Situational Analytics plays a crucial role in the following areas:

- Balancing the variability between supply and demand
- Monitoring asset performance; which in turn helps build an effective asset maintenance plan
- Proactive identification of potential events by analysing alarm and alerts data
- Correlating data streams from multiple sources (SCADA, CRM and WAM) to identify areas for improvement
- Performing root-cause analysis to determine reason for asset failures and triggering preventative actions
- Prioritising tasks based on financial impact to the company
- Identifying potential outage situations and triggering proactive communications to customers

The typical use case can be:

Predict asset failure: Asset failure can be predicted using asset condition, location, maintenance information, SCADA real-time alerts, environmental factors such as flooding, rain, drought etc. Advanced analytical models could help predict the asset failures in real time, help reduce operational maintenance costs and also improve service availability.

Improve customer experience through proactive communication: Real time event management could help the operational command centre team to identify potential issues in the distribution network and pumping stations and alert field and customer contact centre teams to potential events and proactively communicate to customers on potential service unavailability respectively. This improved level of effective communication would result in better customer experience and improved brand reputation.

Efficient investment planning: Traditional asset investment plans are developed without linkage to events impacting wider

customer base. Situational Analytics combined with geo-spatial visual displays would help asset management team to view performance of assets over time visually and also provide the ability to drill down further to view individual performance along with impacted areas and customers. This would also improve regulator confidence on utilities investment plans as they are developed keeping customer service at the centre of investment plans.

Significance for Water Utilities

In the current economic climate, Water Utilities are more than ever under pressure to increase annual turnover and improve debt recovery. In addition, issues of climate change and a growing population are expected to drive even more emphasis on improving infrastructure through investment plans. Water Utilities are therefore required to do more with existing resources in order to improve operational effectiveness.

Collaboration across different business units coupled with Situational Analytics can help a Water Utility to optimise existing investments and improve performance in customer service, operational efficiency, and environmental impact. For Water Utilities, with data loggers and meters providing enormous amount of data, the data correlation and its use in prioritising and deciding appropriate action(s) is the key issue.

Assisting in the decisions of which assets need repair and maintenance vs. replacement will be a key focus area. Moving towards a system that helps predict the potential issues that may occur based on the condition of asset related to that specific area is the first step towards becoming an agile and smart utility with effective operational performance.

An effective Situational Analytics framework

We believe that an effective situational analytics framework should provide an accurate way to predict failures in owned assets and processes, analyse data in real time from a multitude of sources, and provide intelligent allocation of resources to act on and correct the problems. Essentially, the system should work in three stages:-



Analyse the Past and correlate the data that may lead to potential events / failures:

- Integrating silos – Bring together information across a diverse range of sources in real time spanning all legs of a customer's operations and production processes. Seamless integration of diverse information sources helps in having a high level view of the process lifecycle.
- Visualisation tool – Presenting the analyzed data in easily understandable and interactive visualizations helps in quick assimilation and action. It's also important to have a repository of past events and errors in a fully cross-referenced database to help in continuous improvement of processes.
- Big data management – Large entities, like public utilities generate terabytes of data on a daily basis through the large volume of data collected by sensors, meters, loggers etc. Simply managing this deluge of data is a pre-requisite for any effective situational analytics solution.

Anticipate the Future the problem or failure that can occur:

- Predictive analytics - The ability to analyse information is central to good Situational Analytics. A good solution should enable drill down and analyse on specific factors such as projecting the pressure trend into the future based on asset condition, weather factors and population growth. Support for 'what-if' analysis based modelling is also an essential tool in a state-of-the-art situational analytics solution.
- Real-time Event Management (REM) – By intelligently analyzing all data sources and their interrelations with each other, a Real Time Event Management system can help in predicting asset failures and service outages to both stakeholders and customers and is known to help in providing a better customer experience.

Act on the identified actions:

- Dynamic work scheduling – Support pre-built business rules that enable dynamic work scheduling to field engineers
- Intelligent command centre – Ability to schedule work automatically to field engineers by filtering alarms and alerts based on specific business rules
- Standard Operating Procedures (SOP) – SOPs with clear tasks and actions available which enables the field teams to act quickly and effectively

- Enabling organisation structure – Fundamental roles and responsibilities need to be re-structured to enable quick response to the identified issues
- Keeping customers and stakeholders informed - Proactive communications to customers and stakeholders who need to know

Conclusion

By enabling seamless integration across different information systems and effective collaboration between departments, Situational Analytics can enable a Water Utility to deliver improved customer experience, increased operations efficiency and effectiveness, and reduced environmental impacts.

About the Author

Sahadev Singh is the Global head of Wipro's Water Utilities business. Wipro is a global leader in Information Technology services, widely recognized for its innovative approach towards delivering business value and its commitment to sustainability. With over 21 years of experience in helping customers unlock value from their IT investments and drive business strategies, Sahadev is a highly respected advisor to Wipro's Utility industry customers. Under Sahadev's leadership, Wipro has built long terms strategic partnerships with leading Global Water Utilities and established a proven track record for delivering business value. He has cultivated an extensive network within Wipro and its partners, and is able to leverage this network to meet client's challenging needs.

Sahadev's transparent approach to commercial and performance management has won him accolades both with his clients and within Wipro. He is known to lead his team from the front and motivate them to exceed client expectations. Sahadev is passionate about the future capabilities that will define the Water Utilities of tomorrow and is championing Wipro's strategic thinking, innovative solutions and global pursuits for the Water industry sector and IT services industry which includes extensive experience in regulated utilities market. He carries a 360° accountability including P&L, delivery and client and partner relationship at global level.

About Wipro Ltd.

Wipro Ltd. (NYSE:WIT) is a leading Information Technology, Consulting and Outsourcing company that delivers solutions to enable its clients do business better. Wipro delivers winning business outcomes through its deep industry experience and a 360 degree view of "Business through Technology" - helping clients create successful and adaptive businesses. A company recognized globally for its comprehensive portfolio of services, a practitioner's approach to delivering innovation, and an organization wide commitment to sustainability, Wipro has a workforce of 140,000 serving clients across 57 countries.

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