



Applying Sigmafine in the Water & Utilities Industry

A model driven approach to maximize the usability of operational data by utilities

Water is an essential life sustaining resource everywhere in the world. Water systems are critical infrastructures that are capital intensive and challenging to operate.

The operational challenges of water utilities vary by regions, but they always include sustaining water quality, producing and delivering water according to the demand and improving water conservation and reuse, energy consumption and all the factors impacting costs and reliability.

The industry challenges have been and continue to be: do more with less, extend the life of aging infrastructures and improve public safety and water system reliability in the face of growing demographic pressure, extreme weather events and growing water stress worldwide.

To continue meeting both operational and business challenges, the best weapon of the industry is to change the role of data and information in water utility operations and management to accomplish the following fundamental goals:

- Understand what is going on in operations through analytics;
- Develop this insight into an predictive capability;
- Automate actions which can be reliably predicted.

The result will be smarter operations, smarter plants and smarter systems which can take on the industry challenges head on.

The path for this transformation starts with the organization data and information into a usable data set which can be trusted by people, systems and business process.

Such data set is the affair of Pimsoft's Sigmafine technology. Sigmafine pulls together disparate data types (Operations, Inventory, Quality, Energy and Utilities consumption, Chemicals & Catalysts usage, Material Movement including receipts and shipments) into an integrated model which is then solved periodically according to the business rules and constraints set by the organization.

The result is an operational data set with a quantified confidence level which can be trusted by:

- People in operations management, planning and scheduling, business, financial control, energy management, environmental control, etc. for decision making and redirecting business and operations;
- Applications requiring validated data to perform their function of whose performance is enhanced greatly by validated data and information;
- Business process which depend on trustable data to achieve their targeted outcome in a reliable manner.

Solution Area

- Water & Energy Balancing in including water stock management
- Suspect Meter Identification;
- Leakage estimation and monitoring including loss calculations (LI);
- Fiscal and/or commercial reconciliation of water, energy and other utilities exahgnes with through third party interconnections;
- Data validation for compliance reporting;
- Gross error detection;
- Closed loop business process integration with ERP for cost allocation, performance reporting, etc.;

The resulting system can deliver data quality as platform across the organization and become the common basis for people, applications and business process.



Solution Steps

Step 1 – Identify the business scenarios and associated applications which have low tolerance for bad data or unusable data;

Step 2 – Construct a data model that is representative of the desired application. This step involves figuring out the inputs and outputs, the relationship between the assets, the relevant calculations and data transformation required to estimate the consistency and accuracy of the data;

Step 3 – Collect inputs and outputs, run and solve the model. This step will identify data issues and proposed corrected data to generate the best possible data set for a given set observed input and output.

Step 4 – Run this process according to the frequency requirements of the applications (minutes, hours, shifts, days, weeks, etc.). The initial runs are often a discovery. Over time, data issues become less and the process is automated. The KPI becomes keeping the data quality index (DX's) estimated by Sigmafine within the tolerance level of the applications.

Sigmafine can deal with a wide range of model sizes and complexity designed to support specific applications as well as the global data set of the facilities or the distribution network.

Benefits

The direct benefits of improved data quality in the Water Industry are primarily associated with:

- Reduced water losses;
- Reduced energy and utilities consumption;
- More accurate cost allocations;
- Improved billing;

The indirect benefits are associated with:

- Loss avoidance by identifying bad meters early on;
- Reduced time to decision due to automation of data validation process and Reduced risk due to improved data set and quantification of data set quality for decision makers;
- Deferral of capacity increase investment resulting from a more optimal operations;
- Reference Sigmafine Implementation

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