High Level Comparison of SCADA and Analytical Event Management Systems

Event detection and management systems, based on analytics like TaKaDu, and SCADA systems are both deployed in water utilities to improve network efficiency. This paper compares and contrasts the two types of systems and sets out the rationale for having **both** systems in a smart water network, and why they are complementary.

SCADA Systems

SCADA (supervisory control and data acquisition) is a system which enables water utilities to monitor and control their physical assets remotely in real-time.

SCADA provides a graphical display of pumps, pipes, and readings of sensors, control valves and other physical assets in the network; also triggers real-time alerts of irregularities in the system.

SCADA is normally used for:

- Man-Machine-Interface (MMI), enabling operators to visualise the network structure and pre-defined screens containing all controllable assets

- Displaying real-time status of alarms and assets

- Changing pre-defined parameters, for example, opening/closing of pumps and valves, level thresholds etc.

Screens of typical network SCADA systems
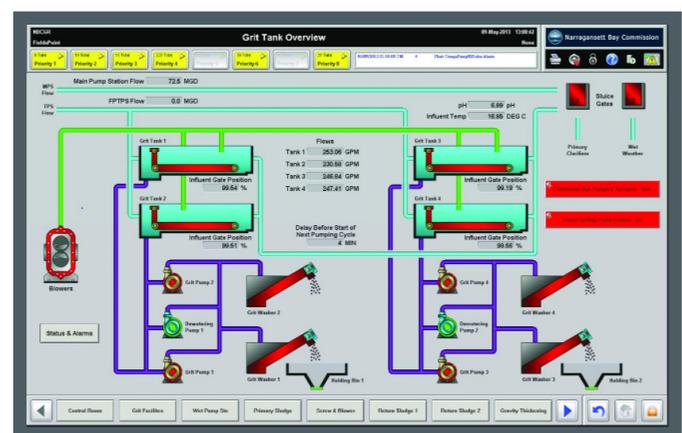
Source: W&WD magazine
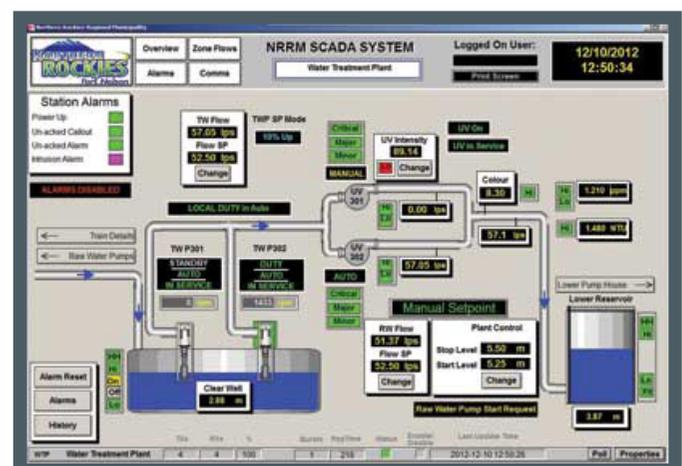
Source: WaterWorld magazine

TaKaDu's Solution

TaKaDu is an IoT cloud-based Central Event Management solution. Based on big data analytics and sophisticated algorithms, TaKaDu enables water utilities to analyse and manage the full life-cycle of network events (incidents), including leaks, bursts, water pressure issues, water quality, operational faults and faulty assets.

Using raw data from multiple sources (often SCADA systems but also from other sources) and a unique analytics engine, TaKaDu generates smart predictions, based on historical and current data, and provides in-depth visibility and quick insights into every type of event, including when it started, how big it is, priority, location, owner etc.

TaKaDu enables utilities to transform the raw data into actionable knowledge about 'events'.

TaKaDu's system generates intuitive and flexible reports for strategic decision-making, providing users with a high-level view of the network.

Screens of Central Event Management solution
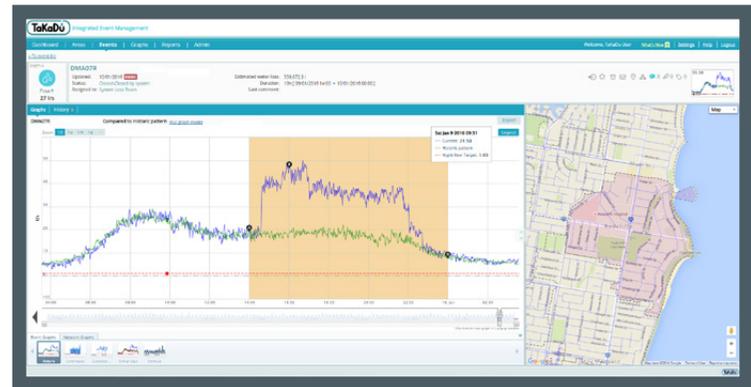
The data stack in a typical utility

Level 5:

Data Fusion and Analysis Solutions (e.g. TaKaDu) Help operators detect and assess network events, and respond to them in real-time scenarios.

Level 4:

Data Management and Display Solutions (SCADA) Enables utilities to aggregate and process collected data into information and interface it for a human operator.

5 Data Fusion and analysis

4 Data Management and Display

3 Collection and Communication

2 Sensing and Control

1 Physical layer

Source: The Smart Water Networks Forum (SWAN)

SCADA vs Central Event Management (TaKaDu)

SCADA Systems:	Central Event Management (TaKaDu):
Displays real-time operational data without analysis or management tools (doesn't provide detailed analysis of past performance).	**Collects and analyses historical and real-time data**, detecting each and every event e.g. hidden leaks, breaches, faulty meters, supply interruptions.
Triggers real-time alerts, specific data points crossing a threshold or breaching a predefined rule without providing the context of the alert. Offers snapshot, without any process continuity.	**Triggers 'smart' alerts**, using predictive analytics to detect interesting events which create an anomaly over time, or have a certain statistical significance. • Provides the context for the event, e.g. how long a leak has been going on, its size, priority, location and connection to other alerts etc. • Triggers one alert (event) per one root cause, rather than repetitive alerts. • Alerts can be dismissed, marked pending etc. • Offers continuous insights over time. • Connects alerts with other relevant alerts.
Provides **equipment-wide view** of operation with limited trending function.	Provides **network-view** comparing the performance of different DMAs (district metered areas) and in-depth visibility and quick insights into irregular events e.g. flow trends.
Impacts specific operational areas.	**Cross-functional impact**, providing insights for every function in the organisation (operational optimisation, network availability, customer service improvement, personnel efficiency, collateral damage prevention, energy savings, water loss reduction, water conservation etc.).
Monitors and controls assets (e.g. turns devices on/off).	**Manages entire event life-cycle** for effective resolution and priorities (e.g. dispatch of field teams).
Hardware and software-based installation.	**Cloud-based service using SaaS business model** – easy to implement with seamless upgrades.
	Other capabilities: • Provides improved data integrity and KPI measurements. • Integrates all utility's data layers into a single knowledge layer. • Provides managerial dashboards, actionable insights and detailed reports to leadership teams, facilitating improved asset management and regulatory compliance.

# Comparison of screen shots showing leak detection

TaKaDu:
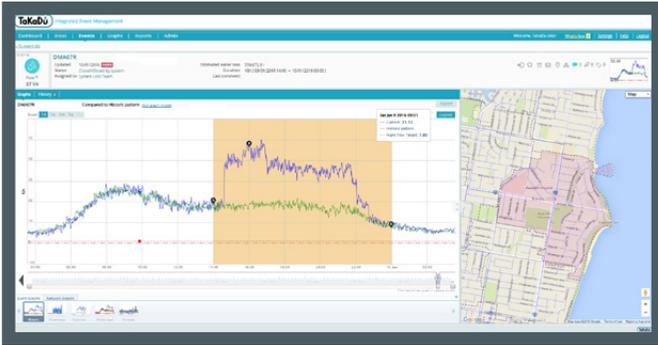
TaKaDu's Central event management enables the event to be understood easily, including relevant information: anomaly's pattern, map, operational information, magnitude of event and more.

The green line shows the predicted pattern, so it's easy to see the event and the deviation from the norm.

The event is highlighted so it's easy to spot when it started and to monitor and manage it through its life-cycle.

SCADA:
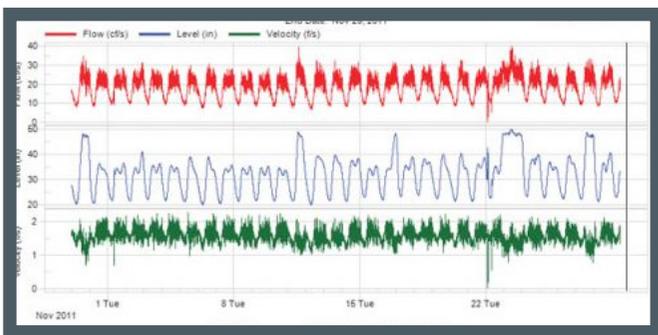
SCADA systems present only real-time data, shown according to pre-set screens and definitions using graph, table or report view.

The data is not processed, analysed, compared and linked to additional sources.

Summary

SCADA systems enable utilities to monitor and control their remote assets in real-time, but offer limited data analysis tools or any decision support process when managing events.

Event management like TaKaDu **enhances and complements** the SCADA layer, which is rich in data and real-time functionality, by providing in-depth visibility, 360 degrees insights, efficient resolution of events, and strategic decision-making tools.
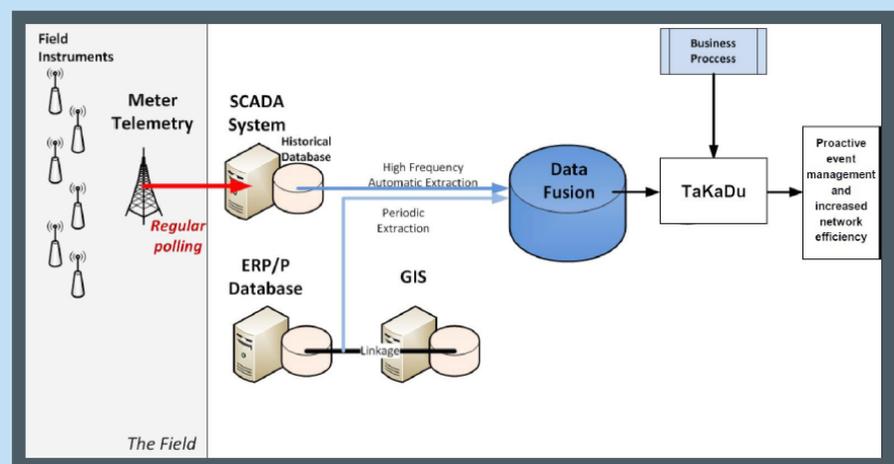
Data sources and flow diagram for TaKaDu
Source: Queensland Urban Utilities, Australia

Integrated together, the two systems offer water utilities a complete solution for improving network efficiency, increasing asset performance, reducing water loss and enhancing customer service.

Central Event Management   **www.takadu.com**