

# INTERNET OF THINGS ANALYTICS

## Use Case Examples



### Energy Management

- Facility run-time monitoring
- Cost monitoring
- Wastage alerting



### Smart Cities

- Traffic management
- Energy monitoring



### Transportation Management

- Predictive maintenance
- Fleet management
- Route optimization



### Security

- Geo-spatial surveillance analysis
- Threat assessment

## THE ENERGY MANAGEMENT CHALLENGE

It's estimated that commercial buildings account for about 40% of the total load on the US electric grid. It's also estimated 30% of that use could be eliminated through improved facility operations. The main culprits of waste are equipment running unnecessarily, or maintenance opportunities that affect efficiency and have gone undetected. This is a widely accepted issue, and while advances in technology have made buildings smarter, they have also added in the way facilities operate. Today, over 50% of large commercial buildings have building automation system hooked into various sensors and controllers which are deployed throughout a building and monitor every system from lighting to HVAC.

While automation creates more data, overall system complexity and an increased requirement in domain knowledge make it difficult for operators to take advantage of the information at their fingertips. Most buildings still operate in a reactive mode based on tenant complaints. The challenge is how to better utilize automation data to transition from reactive facility operations to proactive energy management policies to reduce waste and save money.

### HOW TO COMMUNICATE BUILDING RUN-TIME PERFORMANCE SIMPLY

To enable more energy efficient decision making, new energy management start up building platforms to visualize raw data in a way that makes it easy for building operators to understand, regardless of domain expertise. One such start up, Datakwp, is using Knowi embed within their application platform and provide real-time data visualizations on high volume high performance data stored in ElasticSearch.

## SOLUTION

The energy management platform interacts in real-time with the data, otherwise locked in existing building automation systems, denormalizes and enriches it to add relevant building, equipment and tenant context.

The data pipeline uses multiple big data platforms, but provides a single customer touch point through Knowi visualizations. Within the pipeline, proprietary machine learning algorithms are called upon to identify run-time anomalies and predict future cost trends, among other things. These results also land in ElasticSearch.

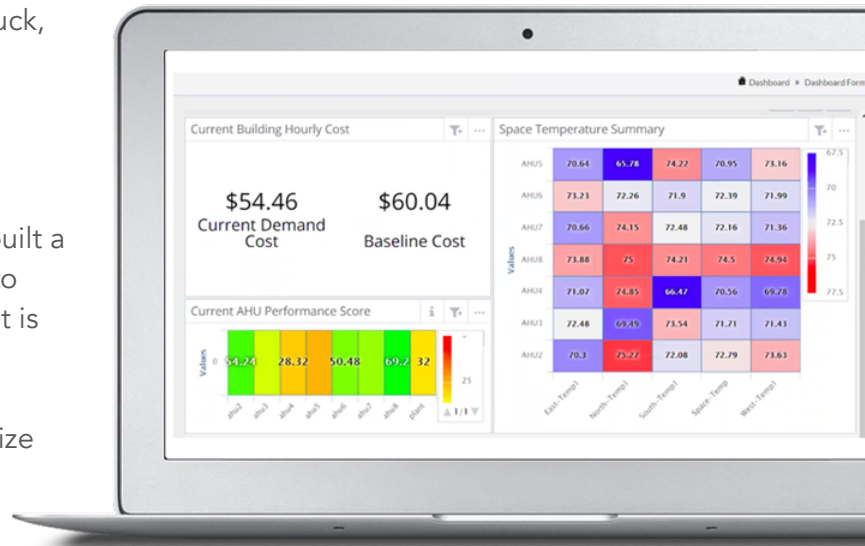
Knowi is embedded within the platform and used to analyze and visualize all the raw data stored in ElasticSearch. "Every time we talk to somebody they were 'hey can you also do this?' because we were utilizing Knowi we could say 'yea, that's just another query.' We're not going in and editing any JavaScript. The functionality of the query has already been tested so as long as it was support by ElasticSearch QL or we could get it using Cloud9QL we can alter that feature", says CEO of Datakwp. He continues, "Knowi is easily embedded through RESTful calls which was challenging for others or required a large mark up. If we got stuck, their customer service was right there for us."

## RESULTS

Using Knowi, the startup's data engineering team built a number of dashboards with drill-down capabilities to enable building operators to easily understand what is happening at any point in time.

The team built visualizations to manage and optimize energy management, including:

- Managing run-time costs to monitor for energy wastage
- Calculate and explore virtual costs to measure pre and post optimization costs savings
- Equipment anomaly detection to identify equipment operating outside expected thresholds



## ABOUT KNOWI

Knowi, AI-driven analytics on modern data, was founded in Oakland, CA with the purpose of dramatically shortening the distance from raw data to action. With native integration to virtually any data source, including NoSQL, SQL, RDBMS, file-based and API's, Knowi eliminates the need for ETL, ODBC drivers, or data transformation processes that alternate solutions require. Knowi is a complete business intelligence platform for enterprises, of any size, who want to unify analytics across their modern data stack and drive actions that matter.

Knowi is a global company with customers in the Americas, Europe, Middle East and Asia supporting companies of all sizes from startups to large multi-national enterprises.

### Contact Information

Website: <https://knowi.com/>  
Email: [info@knowi.com](mailto:info@knowi.com)

### US Headquarters

1528 Webster St.  
Oakland, CA 94612