Intelligent Urban Exchange (IUX) Intelligent Energy: IoT Analytics for Streetlight and Building Energy Optimization

Digital Software & Solutions

Cities are turning to technology to achieve more livable and sustainable environments for their citizens, in cost- effective ways. Smart cities are instrumented and combine data from multiple sources to run advanced analytics and drive decision making at the strategic and operational levels. Based on this information, long term goals are set, monitored and managed, and real time action is possible in order to address immediate opportunities for improvement in alignment with those goals.

Tata Consultancy Services' (TCS') Intelligent Energy solution– part of the Intelligent Urban Exchange (IUX) platform – is designed to help cities optimize energy and conserve energy in buildings and streetlight systems. The IoT and machine learning capabilities, combined with industry specific analytical models, create city and building specific solutions that are capable of automated data driven decision making to conduct optimization in real-time.

Overview

Adaptive Streetlight Optimization

Many streetlight systems used today lack real-time optimization capabilities. They are based on daylight or night schedules and are cost-prohibitive to maintain. The IUX Adaptive Streetlight Optimization solution can adjust streetlight luminosity based on environmental factors, while maintaining citizen safety.

IUX integrates real-time weather, crime, outages, traffic and pedestrian data to create a city specific analytical model that optimizes streetlighting in real time. The platform can integrate with existing streetlight systems to create reports and automate lighting adjustments in real time. Cities retain full control and determine which streets to automate, and which to put on a fixed day/night schedule.

Building Energy Optimization

Buildings are responsible for 40 percent of energy use in most cities, motivating many to find solutions that reduce costs and realize sustainability goals. The IUX Building Energy Optimization delivers a citywide view of energy usage for each building, allowing corrective action for those not meeting efficiency targets.

IUX analyzes real-time and historic consumption and benchmarks it against industry performance parameters to identify areas for improvement. Machine learning enabled models can then be utilized to manage and control systems such as HVAC and lighting in real-time for significant cost and energy savings, without having a negative impact on the occupants.

Our Solution

TCS IUX Intelligent Energy is a modular offering built on the machine learning capable IoT solution, TCS Connected Intelligence Platform. The offering features:

- **Real-time performance monitoring and analysis:** Monitors and analyzes streetlight energy performance against set energy efficiency targets based on real-time and historical data. It benchmarks performance against industry standards to identify areas of improvement. Additionally, it quickly identifies streetlights and buildings that are underperforming on the energy efficiency scale with real-time views and alerts, such as a key performance indicator breach, controller/lap failure, on/off status, and more.

- **Recommendations and Actions:** Delivers recommended actions using a unique optimization model and a proprietary real-time edge analytics agent that communicates with existing systems. Pre-built energy data models for streetlights and buildings help identify optimal operation. Optimized schedules adapt to city priorities such as maximum energy savings, minimized consumption, carbon reduction, and more.

- **Plug and Play Integration:** Features easy integration with existing streetlight, infrastructure and building systems with an energy-specific data model. The robust TCS Connected Intelligence Platform ingests data from all types of sources and allows cities and partners to rapidly and easily extend the solutions' pre-built data model to unique use cases.

Benefits

TCS IUX Intelligent Energy helps cities:

Meet sustainability targets

- Leverage real-time data to proactively optimize energy usage while maintaining safety and livability
- Use real-time and historic data to analyze the performance of buildings to meet energy efficiency targets without degrading occupant comfort or safety

Lower OpEx and CapEx

- Reduce total cost of ownership and increase ROI with easy integration into existing lighting and building systems
- Forecast and set targets with a goal-based approach based on integrated optimization algorithms
- Use adaptive scheduling agents to replace expensive manual analysis
- Deploy "As-A-Service" cloud solution that eliminates the need for costly hardware installations and maintenance

Accelerate Implementation and Benefits Realization

- Integrate key city data into the data model using REST APIs to speed integration
- Streamline management of multiple energy data sources
- Scale efficiently with Big Data Connected Intelligence Platform

The TCS Advantage

TCS' unique value differentiators include:

- **Industry Solutions:** Our software has been created by experts with proven experience in energy conservation. Our Intelligent Energy solution with domain-specific data models incorporates the latest technology innovations and expertise from TCS' R&D.

- **Faster deployment:** IUX's open standards platform enables faster solution implementation and integration with your enterprise's existing lighting systems. The Adaptive Streetlight Optimization and Building Energy Optimization applications feature pre-built domain-specific use cases that accelerate smart deployment. APIs allow for the rapid building and integration of custom applications.

- **Lower cost of ownership:** IUX's modular architecture lets you buy only what you need now with the option to grow as your needs mature. The IUX applications also extend across additional domains such as water and transportation for collaborative and integrated city initiatives.

- **Simplified business and engagement models:** As-a- Service subscription pricing does not require capital outlay. IUX applications are accessible online on desktop or on mobile devices.

- **Experience Certainty commitment:** Our corporate culture is one of superior delivery and customer certainty. Our consulting clients know the quality of our work, and now, companies can get that same level of quality, speed, and certainty with our Digital Software and Solutions offerings.

Awards & Recognition

2019 Brand Finance® Awards — TOP 3 IT SERVICES BRAND

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#1 IN CUSTOMER SATISFACTION 2019 EUROPE — Whitelane Research

top EMPLOYER GLOBAL 2019 — CERTIFIED EXCELLENCE IN EMPLOYEE CONDITIONS

About TCS Digital Software & Solutions Group

TCS Digital Software & Solutions Group delivers on the promise of Connected Consumer IntelligenceTM. Our experience working with the world's most successful enterprises drives the development of integrated software that helps them meet the higher expectations of today's wired consumers and citizens. With TCS DS&S Group software, organizations can design experiences that logically connect every touch point of the consumer's digital and physical journey.

To know more

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Blog: **Catering to the Connected Consumer**

About Tata Consultancy Services Ltd (TCS)

Tata Consultancy Services is an IT services, consulting and business solutions organization that delivers real results to global business, ensuring a level of certainty no other firm can match. TCS offers a consulting-led, integrated portfolio of IT and IT-enabled infrastructure, engineering and assurance services. This is delivered through its unique Global Network Delivery Model™, recognized as the benchmark of excellence in software development. A part of the Tata Group, India's largest industrial conglomerate, TCS has a global footprint and is listed on the National Stock Exchange and Bombay Stock Exchange in India.

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