It is now increasingly commonplace for enterprises to embed connectivity and compute power into all their physical assets in the field. The overarching goal is to integrate operational data from these assets with their information technology and other business process systems. This Internet of Things (IoT)-driven explosion of data presents several opportunities, as customers can be located, educated, acquired, and serviced better than ever before.

Tata Consultancy Services' (TCS') Sensor Data Analytics IoT Framework (SDAF) helps enterprises that are responsible for the integration of operational assets with information technology and business process systems—achieve these objectives. To help retain their competitive edge, SDAF allows organizations to quickly:

- Analyze huge volumes of data being captured continuously by sensor-enabled devices
- Rapidly collect, pre-process, store, and analyze huge volumes of machine data
- Convert this steady stream of information into actionable insights

**Overview**

With the advent of IoT, enterprises have the ability to gather operational data in real-time and perform deep analytics on operational data. This allows them to optimize business processes, substantially tweak strategies, and most importantly, service customers better and faster than ever before.

It also opens up a range of macro level benefits for enterprises, including new and innovative business models, additional customer segments, alternate customer channels, new products and services, enhanced business processes, and more productive workspaces.

To this end, TCS SDAF offers domain specific solutions, which can be leveraged across industry verticals to help enterprises extract granular insight for various functions. These include remote equipment monitoring and diagnostics, predictive maintenance, Telematics insights, demand forecasting, equipment part failure, and so on. The framework's open-source reusable components help enterprises architect and implement an end-to-end IoT solution best suited to their business needs.

**Our Solution**

Key components of SDAF include:

- **Data acquisition**: use standard IoT protocols (MQTT, XMPP) to acquire data from sensors, devices, and equipment in real-time
- **Edge analytics**: perform analytics at the edge to control and monitor connected devices
- **IoT platform integration**: integrate specific SDAF components with other leading IoT platforms to create customized IoT solutions
- **Data transformation and processing**: leverage Big Data to perform large-scale data processing
- **Real-time analytics**: generate and view insights, alerts, and visualization in real-time
- **Data correlation engine**: improve decision making with rule processing and event correlation
- **Data analytics engine**: analyze high volumes of data streams by adopting the Map Reduce paradigm of Big Data
- **Machine learning algorithms**: build industry-specific applications using machine learning algorithms, such as frequent pattern mining, failure prediction, time to failure, demand forecasting and so on

**Benefits**

- **Reduce time to market** with SDAF's ready-to-use components that offer inbuilt capabilities, such as data extraction, transformation, event correlation, and distributed analytics
- **Access real-time insights** on equipment health, demand forecasting, preventive maintenance, and others by monitoring IoT devices in real-time
The TCS Advantage

TCS Sensor Data Analytics IoT Framework helps companies leverage the following to their advantage:

- Big Data and the IoT
- Hadoop Distribution agnostic
- Reusable components for data ingestion for gateway and cloud, transformation, storage, correlation and analytics
- Secure data exchange protocols between edge and cloud
- Lambda architecture for speed and batch data processing
- Parallel algorithm execution for large data sets and improved performance
- Generic as well as domain specific models using Machine Learning concepts
- Support for advanced edge, real-time, and batch analytics

These are backed by our:

- Project management expertise and proven track record of delivering projects successfully and on time
- Digital technology expertise with strong, demonstrable capabilities and assets across technologies, which minimize technology risks across large projects, and drive measurable outcomes reliably and faster
- Industry-specific expertise with extensive experience in implementing IoT solutions across the manufacturing, automotive, insurance, utilities, life science, health care, retail, energy, and airline sectors

Improve the relevance of decisions by leveraging cross-functional insights based on data from different sensor devices coming in different data formats

Reduce support, maintenance, and capital expenditures as our framework offers a single solution to analyze geospatial data, time series data, telematics data, and machine generated log files. By supporting these diverse data types, operations are simplified and efficient.
Awards & Recognition

To know more
Visit Digital Enterprise unit page on tcs.com
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Blog: Digital Reimagination™

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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