

# TCS' IoT Sensor Data Analytics Framework

Digital Enterprise Unit



With the growing popularity of smart devices and the advent of the Internet of Things (IoT), the already exponential growth in data has just found a new dimension. In conjunction, organizations must enhance their ability to quickly analyze the huge volumes of data that are being captured continuously by sensor-enabled devices, and thus generate actionable insights. Big Data platforms help in ingesting and analyzing real-time data at high velocities enabling enterprise-wide agility based on the business insights generated.

Tata Consultancy Services' (TCS') IoT Sensor Data Analytics Framework (SDAF), based on Big Data technologies, helps enterprises rapidly collect, pre-process, store, and analyze sensor data. The framework provides a set of components to implement domain specific solutions which can be leveraged across industry verticals to extract granular insights for various functions including equipment health, predictive maintenance, product usage patterns and demand forecasting.

## Overview

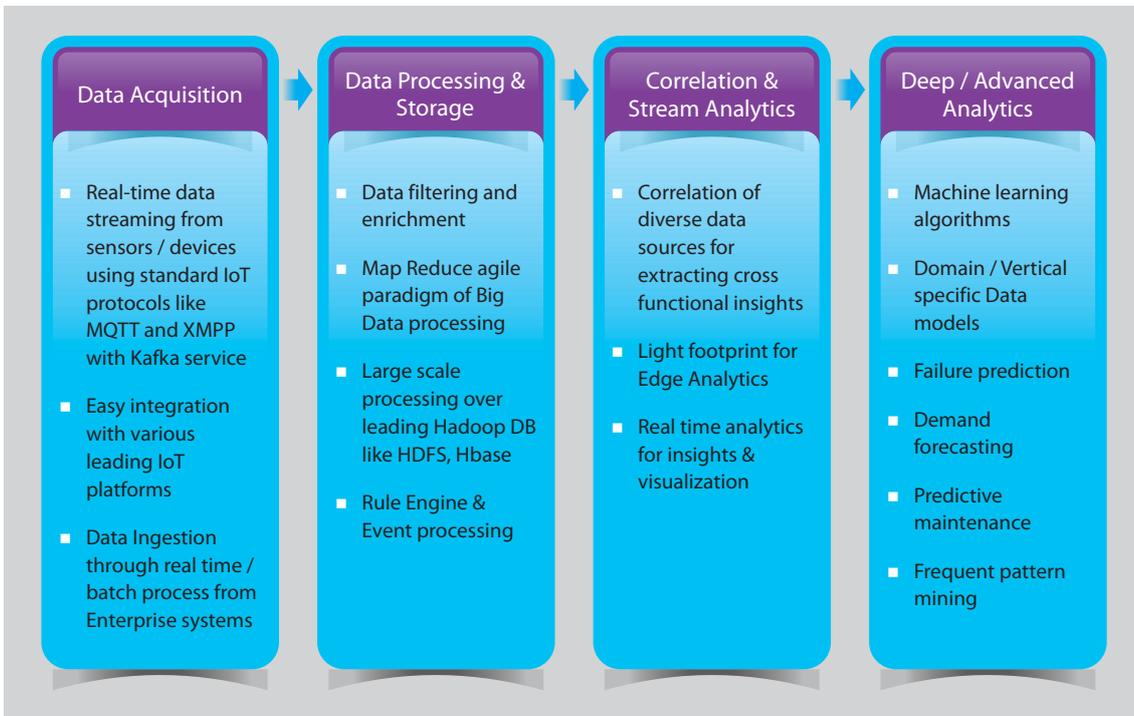
Organizations need to effectively aggregate and analyze the massive amounts of sensor data being generated simultaneously across different devices. Correlating huge data sets involving multiple data sources and formats, and running analytical models to derive meaningful insights leveraging traditional systems is a huge challenge for organizations.

TCS' IoT SDAF, based on Big Data technologies, facilitates real-time ingestion and analysis of huge volumes of streaming data. Our framework facilitates correlation of diverse data sources for extracting cross-functional insights, leading to better informed decision making across the organization.

## Our Solution

Key components include:

- **Data acquisition:** Acquire data from sensors, devices and equipment in real-time using standard IoT protocols like MQTT and XMPP.
- **Edge analytics:** Perform analytics at the Edge to control and monitor connected devices.
- **IoT platform integration:** Enable integration with various leading IoT platforms to provide a comprehensive solution
- **Data transformation and processing:** Leverage the power and agility of Big Data to perform data processing on a large scale.
- **Real time analytics:** Generate and view insights, alerts and visualization in real-time
- **Data correlation engine:** Improve decision making by rule processing and event correlation
- **Data analytics engine:** Adopts the MapReduce paradigm of Big Data processing to analyze high-volume sensor data streams
- **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

TCS' IoT Sensor Data Analytics Framework helps companies reap the following benefits:

- **Quick to Market:** Ready to use components with in-built capabilities such as data extraction, transformation, event correlation and distributed analytics will help reduce time to market
- **Real-time Insights:** Provide insights like equipment health, demand forecasting, preventive maintenance and so on by monitoring IoT devices in real-time
- **Provision to Correlate Multiple Sources:** Improve the relevance of decision making by leveraging cross functional insights based on data from different sensor devices coming in different data formats.
- **Support for Diverse Data Types:** Reduce support, maintenance and upfront investment by using a single solution to analyze geospatial data, time-series data, telematics data, and machine generated log files.

## The TCS Advantage

By partnering with us, you can leverage the following differentiators:

- **Domain-specific models:** Our sensor data analytics framework provides a set of reusable components that can be harnessed to implement domain-specific IoT applications across multiple verticals. The architecture's machine learning algorithms enable rapid development of solutions around predictive maintenance, remote monitoring and diagnostics, telematics, and early warnings for part failures.
- **Configurable framework:** Our framework is highly flexible, in terms of the ability to configure and integrate various data sources and formats, including geospatial data, time-series data, telematics data, and large machine generated log files.

## About TCS' Digital Enterprise Unit

The TCS Digital Enterprise unit applies the Digital Five Forces – Mobility and Pervasive Computing, Big Data and Analytics, Social Media, Cloud, and Artificial Intelligence & Robotics – to meet the unique needs and opportunities of each industry. We help clients reimagine their business models, products and services, customer segments, channels, business processes, and workplaces by leveraging a combination of the Digital Five Forces to gain sustained competitive advantage.

Our experienced global team includes business strategy consultants, business analysts, digital marketers, user experience designers, data scientists, and engineers who are passionate about today's digital technologies and their impact on businesses. Backed by our technology vendor partnerships, pre-built customizable products and reusable assets, and deep industry expertise, we offer everything an enterprise needs for complete Digital Reimagination™.

## Contact

For more information about the TCS' Digital Enterprise unit, visit:

<http://www.tcs.com/digital-enterprise/Pages/default.aspx>

Email: [digital.enterprise@tcs.com](mailto:digital.enterprise@tcs.com)

### 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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