

# TCS Lab of the Future Solutions



# Abstract

Big data is transforming industries and bringing in a new sense of urgency for the life sciences domain. Companies in the life sciences space are dealing with a huge influx of data, and are trying to comprehend and leverage it appropriately. To overcome this challenge, Futuristic Labs' Smart Lab solution aims to harness data and technology, and accelerate the digital transformation.

With the adoption of the Business 4.0 strategy, customers will be able to digitalize and automate lab processes along with better connectivity, integration, and management of lab data such as experiment data, instrument data, and more.

Thus, 'Smart Lab' or 'Labs of the Future' are TCS' priorities for growth and transformation, with a focus on implementing cutting-edge digital technologies to improve operations and business productivity and maximize return on investment (ROI).

## Overview

TCS' Smart Lab solution is an enterprise approach for connecting systems, ensuring data integrity, and enhancing lab support. Generally, the team of scientists and lab technicians working in the laboratories are not able to fully utilize the data generated in the laboratory in conjunction with the experimental and contextual data. Therefore, adoption of TCS' Smart Lab solution is recommended to increase the productivity of lab users by making the data collectively available from different sources, on a near-real time basis.

This data availability reduces the burden of collecting and mapping the data, thereby, allowing more time for research, analysis, quality checks, and compliance. The purpose is also to harness the vast amount of data getting generated in the labs and enable the lab users to derive better insights, make decisions in real-time and improve productivity.

Labs need to address the needs of the lab manager, the analyst and the scientist who use the data generated from the experiments for their research. The Smart Lab solution is designed to address the key challenges of silos and should have different modules for lab admin, lab users, and scientists. The data should be seamlessly shared between these modules so that each persona views the data as per their requirement.

# Our solution



TCS' Smart Lab automates access, management, and traceability of lab instruments and data to improve laboratory productivity and ensure data integrity.

**Instrument connectivity** - The solution supports instrument connectivity over various protocols, intelligent decision-making on the edge, and sends commands back to the instruments.

**Device management** - The solution provides a mechanism to monitor and manage the instruments, including health management, and over-the-air upgrades.

**Lab data storage and standardization** - The solution stores, manages, and catalogs the data, while standardizing it as per the enterprise data model (using configuration-based generic parser).

**Lab data model** - The Smart Lab offers a comprehensive lab data model for process and analytical data.

**Smart Lab apps** - It is an ecosystem that enables various use cases, leveraging AI, machine learning (ML), visualization, predictive analytics, robotics automation, and augmented reality (AR) and virtual reality (VR).

# Benefits



**Better insights generation:** The smart lab solution provides a collaborative ecosystem to harness lab data as a shareable asset.

**Faster turnaround time:** The ecosystem brings together the data from multiple sources seamlessly, thereby enabling faster research, faster development, and faster batch release.

**Improved lab productivity:** Smart Lab helps in minimizing the time and effort for mundane and repetitive tasks, thereby reducing manual errors.

**Easier lab monitoring and maintenance:** The solution allows the user to monitor and manage instruments digitally and remotely.

**Vendor-neutral approach:** Smart Lab can be connected to any instrument, lab informatics management system (LIMS), electronic lab notebook (ELN), or other lab applications.

**Modular plug and play approach:** The solution has a configuration-driven, and scalable microservices architecture.

# The TCS advantage



## Lab of the Future thought leadership

Offers a lab ecosystem to build business applications such as AI and ML based applications, predictive maintenance, lab scheduler, batch prediction, AR and VR-based user support, and more.

## Ecosystem-based approach and partnership model

Brings together various stakeholders in the Lab to create an ecosystem of partners and life sciences organizations that employ instrument vendors, labs, lab application vendors, and more.

## Rich domain knowledge

TCS develops holistic labs by providing IT expertise, practical knowledge, and industry best practices. TCS paves the way for lab modernization through processes such as change management, benchtop support, global rollout, and more.

## Deep connections drive innovation

TCS works globally, creating consistency of engagement with customers around the world and takes an iterative approach to deliver rapid realization of benefits and ROI.

## Flexible pricing model

- a. From entity-based to enterprise models.
- b. Customized as per the customer's requirements.

# Awards and accolades



## Contact

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## About Tata Consultancy Services Ltd (TCS)

Tata Consultancy Services is a purpose-led transformation partner to many of the world's largest businesses. For more than 50 years, it has been collaborating with clients and communities to build a greater future through innovation and collective knowledge. TCS offers an integrated portfolio of cognitive powered business, technology, and engineering services and solutions. The company's 500,000+ consultants in 46 countries help empower individuals, enterprises, and societies to build on belief.

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