

TCS Autoscape™ - A neural automotive solution for autonomous vehicles

Manufacturing



In their endeavor to shape the future of mobility, global car manufacturers are racing to develop SAE Level 5 autonomous vehicles (AV). To develop fully autonomous vehicles, manufacturers have to efficiently manage myriad technology and business challenges. Among these are collecting and analyzing petabyte-scale driving data. Technology teams then use the data to develop and deploy algorithms to guide AVs in the real world.

Facilitating the development of AVs is the TCS Autoscape™ - Autonomous vehicle solutions suite which uses leading-edge technologies such as artificial intelligence (AI) and machine learning (ML) to transform the car into an agile, customer-centric product, and improve the productivity and quality of vehicle data management services. Our proprietary Machine First Delivery Model™ (MFDM) helps our customers build complete AVs by accelerating time-to-market and optimizing capital expenditure.

Overview

To make L5 AVs a reality, manufacturers must harness the right data. To achieve this, engineering and IT teams need to:

- Seamlessly collect and manage petabyte-scale autonomous driving data from in-vehicle recorders.
- Search, analyze, and interpret petabyte-scale data collected from autonomous vehicles across multiple test locations.
- Optimize the lifecycle management of AV data and ensure secure access to globally distributed teams.
- Curate perception data from sensors such as cameras, lidars, and radars and generate training dataset at scale.
- Ensure robust verification and validation of AV algorithms to ensure passenger safety.
- Securely deploy software updates to AVs in near real time

TCS Autoscape™ - Autonomous vehicle solutions leverage Business 4.0™ pillars (intelligent, agile, automated, and on the cloud) to offer end-to-end capabilities across vehicle engineering, algorithm development, application lifecycle and data management, and vehicle validation. With in-depth manufacturing experience and an extensive partner ecosystem, TCS is well-positioned to cater to bespoke customer needs in the AV space and drastically accelerate time-to-market.

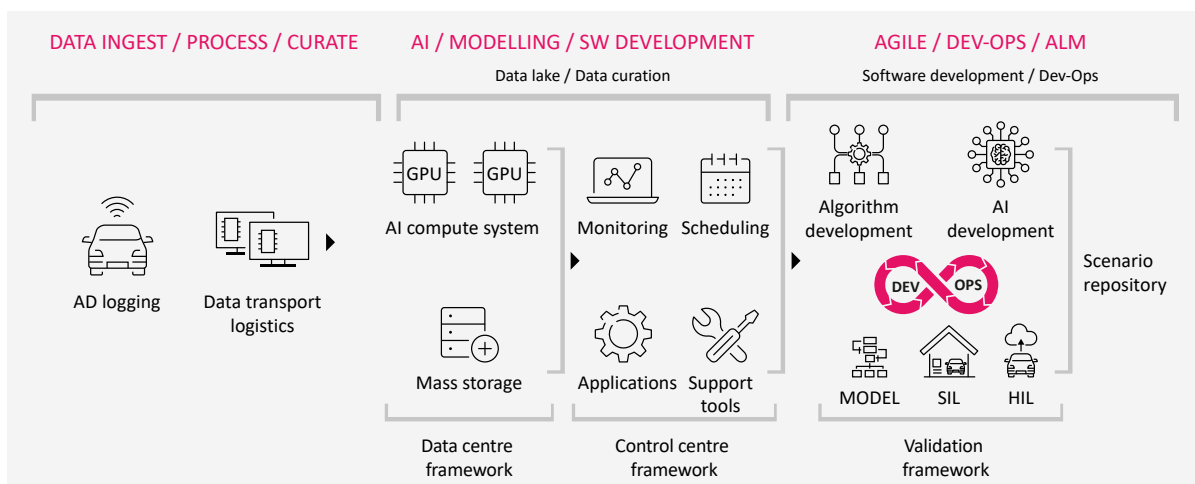


Figure 1: TCS Autoscape™ – Autonomous vehicle solutions

Our solution

TCS Autoscape™ Autonomous vehicle solutions comprise of the following:

- **TCS AV data services:** Comprehensive compute infrastructure architecture, data management solution, AI workbench, and toolkits to manage AV Data and accelerate AV development.
- **TCS Data Annotation Studio:** Data curation solution with costeffective workflow orchestration, model management, and best-in-class AI tools.
- **TCS Smart Validation:** A simulation-led validation platform that is coverage driven and enables AI enhanced test case and scenario generation, and true edge case identification. The solution accelerates time to market, significantly reduces cost, and enhances the validation process.
- **Application Lifecycle Management (ALM):** An ALM solution underpinned by TCS' ALM methodology, solutions, and industry-leading partner ALM solutions.

Benefits

TCS Autoscape™ enables customers to achieve the following benefits:

- **Total cost of operations:** Reduce the total cost of operations through effective utilization and optimization of cloud infrastructure and resources.
- **AV industry expertise:** Leverage TCS' deep expertise in the AV industry with simulation techniques, AI and ML models, and agile execution to robustly test AV algorithms.
- **Cost capital:** Reduce capex and opex for autonomous components and feature development.
- **Time to market:** Enable faster turnaround time on curated data for effective algorithm and model building, and improved productivity.
- **Agile deployment:** Focus on DevOps deployment using TCS' solution accelerators and expertise in cloud computing infrastructure.
- **One stop shop:** Ensure end-to-end capability across the vehicle development lifecycle.
- **Vehicle simulation testing:** Simulation-led and coverage-driven framework at scale to ensure thoroughness in validation testing.
- **Data management:** Catalog optimized solutions for robust data management and curation.

The TCS advantage

By partnering with TCS, AV manufacturers gain numerous advantages, as illustrated below:



Leading domain and technology expertise: TCS partners with leading global organizations across industries, helping customers blueprint and execute AV projects. TCS MFDM™ helps manufacturers adopt a shift-left approach for data and algorithm development. In addition, we offer a robust and mature validation framework leveraging our deep expertise in the AV industry with simulation techniques, AI and ML models, and agile test execution.



Industry partnership and alliance: We lean into our strategic partnerships with hyperscale cloud, AV validation, and AV data pipeline management providers to develop industry-leading technology solutions backed by best-in-class frameworks.



Comprehensive autonomous vehicle portfolio: TCS' range of proprietary industry-specific autonomous vehicle frameworks, tools, models, and accelerators are designed to help manufacturers accelerate their AV vision.

Contact

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About Tata Consultancy Services Ltd (TCS)

Tata Consultancy Services is an IT services, consulting and business solutions organisation that has been partnering with many of the world's largest businesses in their transformation journeys for over 50 years. TCS offers a consulting-led, cognitive powered, integrated portfolio of business, technology and engineering services and solutions. This is delivered through its unique Location Independent Agile™ delivery model, recognised as a benchmark of excellence in software development.

A part of the Tata group, India's largest multinational business group, TCS has over 500,000 of the world's best-trained consultants in 46 countries. The company generated consolidated revenues of US \$22.2 billion in the fiscal year ended March 31, 2021 and is listed on the BSE (formerly Bombay Stock Exchange) and the NSE (National Stock Exchange) in India. TCS' proactive stance on climate change and award-winning work with communities across the world have earned it a place in leading sustainability indices such as the MSCI Global Sustainability Index and the FTSE4Good Emerging Index.

For more information, visit www.tcs.com.

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