

Case Study: Multinational Automotive Company



# Addressing the data problem with autonomous vehicles

Client: Multinational Automotive Company

Location: Northern & Central Europe

Industry: Automotive

### Challenge

- Reduce iteration cycles and other processes to accelerate the development of the autonomous vehicle fleet
- Manage the data generated by self-driving vehicles and identify novel situations to increase consumer safety
- Accelerate the process of “teaching” vehicles how to handle unique environmental conditions

### Solution

- Leverage DXC Robotic Drive to manage massive data flows in native vehicle data formats
- Expedite data analysis to reduce the learning curve for smart-car AI controls
- Automate deployment of functional testing

### Results

- Reduced “time to drive” and “time to analyze” to accelerate delivery of autonomous vehicles to the marketplace
- Maximized return on investment of test vehicles with improved R&D efficiency
- Accelerated progression through the sequences of autonomous driving levels

The automotive industry has entered a new period of innovation focused on delivery of self-driving vehicles, with established auto manufacturers and tech-savvy outsiders alike pouring billions of dollars into the development of autonomous vehicles to carry people and transport freight.

This new cycle of invention and experimentation is being driven by changing mobility and customer demands, as well as safety and environmental concerns. But it is made possible by recent strides in IT — specifically, the ability to capture massive amounts of data about the vehicle and the driving environment. DXC Technology was hired by a global auto manufacturing company to help more efficiently capture the data being gathered by its self-driving vehicles and use that information to advance development efforts.

## The autonomous vehicle scaling challenge

Innovation was once an in-house exercise driven largely by a company’s own engineering and R&D staff. Like other companies in the industry, this global auto manufacturer was challenged with scaling the development of autonomous vehicles, which requires a wide range of skills and capabilities. In many cases, these have less to do with how to make a vehicle go and everything to do with how to make it safe and smart, such as expertise in artificial intelligence (AI), machine learning, next-generation computer science and data management.

It is imperative that an autonomous vehicle be able to “see” where it is going, detect and avoid hazards, and transport passengers safely with little or no human input. This requires collecting and processing massive amounts of data. Real-time data about the environment — weather, road conditions, other vehicles, pedestrians and street signs — combined with information about the vehicle and the intelligence needed to make instant driving decisions, generates up to 4 terabytes of data per hour for one test vehicle.

That data is analyzed for real-time events as managed by the vehicle, but later the data is analyzed by manufacturers, scene by scene, to identify novel driving conditions that can be used to inform the AI that underlies the vehicle’s autonomous operations.

The problem of scale becomes apparent as hundreds of hours of recorded data must be searched for unique instances that can then be used to “train” the autonomous driving algorithms on how to manage those new situations. This can take weeks of research.

## Enabling autonomous acceleration

In the highly competitive auto industry, it is essential to have the ability to process and act on autonomous driving data quickly and efficiently. This global auto manufacturer was looking to reduce iteration cycles and other processes to accelerate the development of its autonomous vehicle fleet. A team of DXC technologists helped the company speed up its self-driving car R&D, and has been recognized by DXC with a 2019 Technical Excellence award for its work.

The DXC team, working with the DXC Robotic Drive autonomous driving platform, toolkit and accelerators, built a solution to collect and manage the massive data streams created by the auto manufacturer's test fleet. AI and deep learning solutions were created to analyze the data quickly and to automatically flag interesting encounters that could provide valuable lessons to the fleet's autonomous driving software.

Built from standard components on an open source ecosystem, DXC Robotic Drive helps automakers rapidly analyze data in the format that was recorded by the vehicle, a major time-saving step, versus having to convert the data. The development of solutions such as DXC Robotic Drive is giving auto manufacturers the platform, tools and skills needed to accelerate the development of fully autonomous vehicles.

DXC Robotic Drive also provides auto manufacturers with the tools to train AI models with deep-learning clusters and automate testing to further speed the process. What's more, DXC Robotic Drive gives autonomous driving R&D teams a platform to manage the data collected by a test vehicle fleet on the highway — a capability that's needed to move autonomous vehicles from the experimental stage to the showroom floor.

## Speeding up data ingestion

Successful application of the DXC Robotic Drive solution's autonomous driving platform, toolkit, accelerators and expertise helped produce numerous benefits for the auto manufacturer. This included faster data ingest rates (minutes rather than days), faster development of algorithms, shorter iteration cycles, a 50 percent reduction in time to drive and significant algorithmic performance gains.

Ultimately, the DXC team's efforts will help the client's vehicles reduce system disengagement rates (when driving control is turned over to a human), which today are at a near-human level. This is a critical step forward. DXC helped its customer put a fleet of Level 4 autonomous cars on the busy streets of a major U.S. city. This fleet eventually will be capable of fully autonomous operation.

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