DXC TECHNOLOGY

Addressing the autonomous vehicle data problem

CUSTOMER
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

- Data analytics to reduce the learning curve for smart-car AI controls
- DXC Autonomous Drive to manage massive data flows in native vehicle data formats
- Automated deployment of functional testing

Results

- Reduced “time to drive” and “time to analyze” for faster delivery of autonomous vehicles to the marketplace
- Automated end-to-end approach from data ingestion and processing to functional testing and in-car deployment
- Accelerated progression through the sequences of autonomous driving levels for increased ROI

Addressing the autonomous vehicle data problem

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

With hundreds of hours of recorded data to search for unique instances that can be used to "train" autonomous driving algorithms, the problem of scale becomes apparent.

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 — the ability to capture massive amounts of data and apply a deep learning algorithm to images to recognize other vehicles.

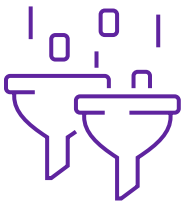
DXC Technology was hired by a global auto manufacturing company to help more efficiently capture the data being gathered by its self-driving vehicles and use that information to advance development efforts.

The scaling challenge

Innovation was once an in-house exercise, but as OEMs develop autonomous driving algorithms on their own they are collaborating with other automakers. 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.



DXC Autonomous 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.

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.

A team of DXC technologists helped the company speed up its self-driving car R&D and has been recognized by DXC with a Technical Excellence award for its work.

The DXC team, working with the DXC Autonomous Drive 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 Autonomous 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.

DXC Autonomous Drive also provides auto manufacturers with large containerized compute clusters and the software infrastructure for orchestrating Deep Neural Network training.

What's more, DXC Autonomous Drive gives R&D teams a platform to manage and search the data collected by a test fleet in an urban driving setting — 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'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 customer'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 that helps DXC's auto manufacturing customer build and manage a fleet of Level 4 autonomous cars for the busy streets of a major US city.

These vehicles will eventually be capable of fully autonomous operation.

Learn more at
dxc.com/automotive