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NVIDIA EU

The Future of Autonomous Transportation Requires AI Supercomputing in the Car and in the Cloud

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TRANSFORMING

AUTOMOTIVE LEASING



GEATSE MEESTER,
CEO

Traffic School in the Digital Age

How CIOs will Play a Significant Role in the Development of Future Mobility

BY OLIVER JAENISCH, SALES MANAGER - ADAS TESTING SOLUTIONS, HELLA AGLAIA MOBILE VISION GMBH



With our innovative testing processes and systems, we create certainty and trust in automated driving. In close collaboration with automotive key players, our ADAS/AD development team has defined testing and validation methods and software to support engineering.

Developing self-driving cars is not just a task for dedicated R&D teams. Innovative functionalities required for connected cars, smart mobility services, assisted, automated and autonomous driving has redefined the traditional role of the CIO from IT delivery to a visionary leader and innovator supporting the engineering department. Agile development and testing, microservices,

cloud computing, analytics, collaboration, data management and workflow management are increasingly essential for the development of future vehicles. The CIO plays a vital role in ensuring the digital transformation, as an enabler of agility and an advisor and entrepreneur, supporting the business ecosystem and R&D workflow.

Innovative solutions like advanced driver assistance systems (ADAS) and autonomous driving (AD) require new concepts, methods and tools. Without the involvement of IT, internal policies are disregarded, an integration in the overall enterprise infrastructure is complex and reuse of other departments is hampered. In addition, these kinds of isolated solutions are not meeting the demands of supportability, scalability, maintainability, and security. Intelligent data management systems optimize data-based processes of ADAS/AD series development, testing and validation.

Safe, reliable, state-of-the-art driver assistance systems require extensive testing, as shown by the hundreds of thousands of kilometers that have to be driven in the lab and under real-world conditions. Do the cameras identify all road signs and objects? Do the sensors detect special weather conditions such as moisture or fog? Do the algorithms estimate the behavior of other road users correctly?

Besides our ADAS/AD development, the pillar of testing and validation has become important. As a service provider for OEMs and Tier 1 suppliers, we provide test infrastructures developed in-house that support HELLA components along with other supplier parts.

We test a wide range of different scenarios, gathering all the smart data provided by the sensors during the data drives on real streets that can be used for virtual test drives. Once the data is acquired, it can be played back at any time, providing a virtual test drive. This saves money and requires significantly less effort.

Enabling the vehicle to "see" digitally is necessary to consider all possible scenarios, with a view of having all necessary data for the respective test, called ground truth (GT), representing reality with an accuracy of nearly 100 percent. This is run to the system being tested until the algorithm functions flawlessly: Traffic school in the digital age.

A typical data drive over a distance of 7,000 kilometers will result in a data volume

of approximately 200 TB. At least one million kilometers are necessary to test assistance functions to an adequate extent and with the highest standards of reliability. Validating this will require an amount of data acquired globally and stored in different locations. Handling the data as a whole - often growing rapidly up to double-digit petabytes - requires data management that supports continuous testing by ensuring access for all involved engineers, test managers, and project leaders.

Leveraging the data lakes is the challenge that requires powerful and intelligent data management systems, beyond the functionalities of pure search engines. The intelligent data management system (DMS) developed specially for the digital traffic school is the centerpiece of an integrated tool chain. As a data-as-a-service (DaaS) cloud-based NoSQL platform, all GT-relevant data is accessible to the stakeholders regardless of organizational or geographical barriers.

Capturing, cleaning, defining, and aligning the disparate data requires data curation. The complex scenarios are defined on indexed data and its corresponding meta data, helping the R&D teams deal with the large amounts of data for better discoverability. The DMS allows for optimized scenario management, including ordering playlists for virtual test tracks or other processes. The integrated automation framework orchestrates all steps of the test and validation process, reducing manual effort significantly and ensuring faster time for all relevant data. Continuous monitoring over the relevant data and the current status of the workflow supports agile development and, additionally, saves

further costs for redundant data and quality loss.

ADAS/AD solutions will have significant impact on the future of mobility, and are the result of merging traditional engineering with digital development. CIOs in the automotive industry will play an increasingly important role as the driver of digital transformation and innovation, especially when managing huge data volumes, at different locations and where access to this data by all stakeholders along the development process is crucial. As a digital leader, the CIO will make a key contribution to improved quality, faster time to market and reduced development costs of ADAS/AD systems by unlocking and speeding innovation. **CA**



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