

Qualitest Helps OEM Launch Autonomous Vehicles with Superb Software and Hardware Testing



Challenges

The Client had an internal team of architects who lacked the ability to implement adequate hardware/software testing.

Cybersecurity was a huge challenge due to the myriad of different data breaches and cyber security attacks that the Client needed to be protected against.



Solutions

Provided skilled resources to help drive processes and the architecture team to implement tests smoothly and efficiently.

Performed hardware and software testing in the field of cyber security for a firewall product.



Results

Processes in software testing were implemented in a more streamlined way. Testing was delivered in less than 50% of the time.

Through stringent testing cyber-attacks and data breaches were caught and avoided by closing back doors and vulnerabilities that where an attacker could gain access.



Client overview

Our Client, a leading automotive organisation who is a leader in autonomous vehicles, creates cars for the future that stage high-tech and arouse emotions at the same time.

As an original equipment manufacturer (OEM), they faced unique challenges. The complexity and critical nature of autonomous vehicle technology demanded rigorous testing and validation. Our Client had to ensure that their vehicle components met stringent safety standards, performed flawlessly under various scenarios, and withstood real-world challenges.

The spy who drove me: ensuring robust security in autonomous vehicles

Testing autonomous vehicles involves assessing not only the software components but also the hardware systems that enabled vehicle autonomy. The dynamic nature of road conditions, unpredictable scenarios, and the need to account for human interaction made testing an intricate and ongoing process.

Furthermore, the deployment of autonomous vehicles required extensive testing to verify the effectiveness of cybersecurity measures. As autonomous vehicles rely heavily on connected systems and networks, the Client had to ensure robust protection against potential cyber threats and vulnerabilities.

The combination of cutting-edge technology, safety considerations, and cybersecurity requirements made testing in the world of autonomous vehicles a significant challenge. The Client had to invest in skilled teams, advanced testing methodologies, and continuous innovation to meet these challenges and deliver safe and reliable autonomous vehicles to the market.

The Client had a strategic plan to enter the autonomous vehicle industry, but there was a lack of coordination between the various departments involved, including testing, development, and architecture teams. As a result, there was a discrepancy between the intended business plan and the actual implementation on the ground. The organization struggled to define the practical requirements, and we identified the following gaps:

- Insufficient communication among departments
- Lack of alignment between the strategic plan and the actual execution
- Inadequate integration between the testing processes and the architecture team
- Insufficient management and supervision of the testing team

Lack of documentation for the testing processes along with recognizing that their organization lacked the necessary expertise, the Client concluded that to successfully implement the program, a leadership role must be incorporated in testing, encompassing both software and hardware aspects.



The great car-nival: leveraging strong resources to test autonomous vehicles safely

In a situation where clear requirements were lacking and insufficient documentation existed to support the proposed solution, we approached the challenge comprehensively. We worked closely with the Client to identify, expand, and document their detailed requirements, business process flows, and use cases. To achieve this, we assigned a full-time senior tester with over eight years of experience in hardware and software testing, as well as team management, to the company site.

During the process, we leveraged our internal resources, including the support of knowledgeable individuals within our organization who collaborated with the client to gain insights and establish requirements that aligned with their needs. This approach was beneficial in several ways:

- Facilitating communication between various departments: the global testing team, local architecture team, and the business entity.
- Achieving synchronization between the strategic plan and its actual execution.
- Facilitating implementation between the testing processes and the architecture team, including integrating testing requirements into architectural plans and providing feedback.
- Managing and supervising the global testing team, including training and knowledge transfer in the field of hardware and software.
- Documenting testing processes and closely collaborating with the development team.

By adopting a holistic and consultative approach to address the root causes of the project's challenges, we assisted the Client through:

- Defining the client's expectations.
- Managing the relationship with the developers.
- Identifying inconsistencies between requirements and plans earlier, resulting in more productive, efficient, and cost-effective test execution activities.

“ The Client had a strategic plan to enter the autonomous vehicle industry, but there was a lack of coordination between the various departments involved, including testing, development, and architecture teams. ”



Key benefits

Our precision project management of this complex undertaking resulted in the Client gaining:

- **Comprehensive approach:** 100% coverage was achieved of all project aspects including documenting detailed requirements, business process flows and use cases.
- **Leveraged internal resources:** the Client was able to prevent the waste of 10 plus months by redirecting work on the project to other areas to ensure proper focus.
- **Streamlined processes:** the Client was able to improve productivity through reducing test design work hours by up to 50% via our standardized templates and use cases to ensure consistent, efficient, and error-free test deployment.
- **Optimized efficiency and cost-effectiveness:** the Client achieved more efficient and cost-effective test execution with testing processes advancing the project 6 months ahead of schedule.
- **Enhanced testing expertise:** the Client was able to reap the benefits of having a full-time senior tester with them in-house to effectively address their ongoing testing needs.
- **Facilitated collaboration and alignment:** the Client benefitted from enhanced communication and coordination between departments along with greater alignment among key stakeholders.

“ The Client was able to achieve 100% coverage across all aspects of the project, including documenting detailed requirements, flows, use cases and business processes. ”

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