



Automation ensures enhanced testing of advanced automotive cockpit systems

Partnering with Capgemini, a global automotive component manufacturer deploys automation for the testing and validation process of its advanced cockpit systems for enhanced product quality, faster time-to-market, and reduced product development cost

Smarter testing for smarter vehicles

Every year, vehicles become more advanced, more capable, and more challenging to design and build. A leading global manufacturer of automotive parts wanted to consistently innovate in order to keep competition at bay and meet the growing customer expectations driven by advances such as connected cars. To accomplish this, the organization has invested in ASPICE systems engineering techniques and processes. Additionally, the business recognized that producing quality products with reduced cost and time requires rigorous testing and validation process throughout the product development process.

After considering its opportunities for improvement, the manufacturer identified that it could generate greater efficiency within its testing and validation processes. In order to streamline its approach, it decided that it would be best served by implementing automated solutions that would be able to predict and simulate business scenarios.

Overview

Client: A leading global automotive components manufacturer

Region: North America

Sector: Automotive

Client Challenge: A leading automotive components manufacturer wanted to improve the quality, accuracy, and speed of its testing and validation processes in order to ensure product quality of their cockpit systems

Solution: The business introduced automation into its testing and validation processes in collaboration with Capgemini, ensuring that it can deliver the highest-quality automotive cockpit systems

Benefits:

- Enhanced product quality
- Faster time-to-market with reduced product development cost
- Improved testing accuracy and reduced need for manual intervention



Such an undertaking would require a partner that offered the necessary technical expertise as well as a history of automation success. Considering an existing 15-year-long relationship and extensive history of impactful automation deliveries, Capgemini's Engineering and R&D Services was selected to provide product and test engineering support.

Creating automated testing solutions

The partners launched the project by creating a specialist team to conduct another review of the existing testing and validation processes while also reviewing industry best practices in order to identify the best opportunities and solution for an upgrade. Based on these studies, the manufacturer and Capgemini then manually tested some of the key clusters. By doing so, the expert team was able to develop several in-house simulators, an important step towards automation testing.

Through thorough investigation and testing, the partners developed a set of in-house tools and automation solutions that were tailored to each identified need. These solutions were then introduced throughout the organization, helping reinforce the testing and validation processes. By doing so, the manufacturer was able to adjust to changing scopes and inputs while enjoying uniform results across all partner vendors.

As the number of test cases has increased and the evidence of automation's ability to support the original objectives grew, the partners began to apply this approach to increasingly important initiatives, all the while ensuring that the new tools and solutions remained compliant with regulatory guidelines. The manufacturer's vision of adopting stronger enablers across the test cycle from requirements, test cases, and automation to release cycles of the cockpit systems is ably complemented by Capgemini's expertise in automation and quality engineering practices.

Automation unlocks a future of better product quality

With this new approach to testing and validation, the organization and Capgemini together have prepared for a future of growing demand for increasingly sophisticated cockpit systems. With more than 55,000 test cases under automated testing for instrument clusters, regression testing, smoke and sanity testing, and simulation testing, the organizations have identified and contained defects across various programs. In addition, automated testing has drastically reduced the need for manual intervention and testing time, improving the manufacturer's overall time-to-market and setting the standards for quality in automotive systems.





Driven by the business' thought leadership, Capgemini experts continuously scan the technology landscape to identify better ways of engineering. Over 25 tools and industry-leading HIL setup continue to achieve the organization's automation goals. With increased test cases and dynamic requirements, the teams have moved on to the bigger initiatives of ensuring requirement coverage with test cases and ensuring code compliance to FUSA guidelines.

The manufacturer and Capgemini have worked together to meet demanding timelines with quality and performance requirements needed for automotive research and development projects. Capgemini continues to support the organization with certification testing and undertakes joint analysis with certifying partners like Google and Apple. With the right blend of automotive engineering and product and system testing expertise, Capgemini has helped the business win a patent.

In addition, after the success of the project, the organization scaled the partnership with Capgemini to include infotainment systems as well. Under extensive test automation, the partners not only automated the functional test cases but also those requiring external interface and voice input. The well-structured and scalable solution is now adopted by the organization in infotainment projects for various car OEMs.

Together, the manufacturer and Capgemini have developed a new approach to testing and validation that ensures the superior quality of automotive parts while also maintaining the speed needed to keep up with modern demand. This project represents the organizations' commitment to the testing and manufacturing of industry-leading premium automotive systems that will support a new wave of advanced vehicles.

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