Takeover and Enhancement of Next-Gen Digital Cockpit for a Global OEM

In 2021, Acsia successfully took over the development of a next-generation digital cockpit for a leading luxury OEM, overcoming significant challenges in integration and continuity to ensure a sophisticated, connected driving experience.

Business & Technology Landscape

During the year 2021, the automotive software domain saw significant advancements, particularly in Software-Defined Vehicles (SDVs) and Digital Cockpits, driven by the demand for sophisticated, connected, and intelligent vehicles.

Key Trends in SDV

- Over-the-Air (OTA) Updates:Prevalence of OTA updates for deploying new features, security patches, and performance improvements remotely.
- Enhanced Vehicle Connectivity: Reliance on robust communication networks like 5G for real-time data exchange, telematics, and V2X communication, enabling advanced driver assistance systems (ADAS) and autonomous driving capabilities.
- Centralized Computing Architectures: Transition from multiple electronic control units (ECUs) to centralized computing platforms, offering greater processing power and improved system integration.

Digital Cockpit Trends

- Unified User Interfaces: Integration of instrument clusters, infotainment systems, and head-up displays into a single, unified user interface for seamless interaction.
- Advanced Infotainment Systems: Featuring voice recognition, gesture control, and personalized content powered by advanced processors and GPUs.
- High-Resolution Displays and Graphics: Adoption of high-resolution displays, OLED panels, and curved screens for clearer and more vibrant visuals.
- Connectivity and Smart Services: Support for connected services and third-party applications, enabling functionalities like real-time navigation and streaming media.
- Personalization and User Profiles: Extensive personalization options for users to customize their driving experience.

Customer Problem Statement

The client, a Tier-I supplier, for a leading luxury OEM, was in the lookout for a new software partner to support the development of next-gen cockpit module.

Maintenance Takeover

This was a maintenance takeover project with Acsia taking over the entire Start of Production (SOP) in March 2023.

Initial Scope

Identifying defects/bugs reported during field trials by the OEM or other vendors and providing fixes.

Acsia Solution

The client decided to work with Acsia due to their strong track record in delivering successful projects in the instrument cluster and infotainment domains. Acsia's demos and facility audits showcased their proven expertise, making them the ideal partner for this project.

Project Responsibilities

- **Pre-SOP Support and Takeover:** Acsia took over the project before the Start of Production (SOP) was established, handling the entire software responsibility, including bug fixes and change requests.
- **Post-SOP Software Maintenance:** After SOP, Acsia continued to provide software maintenance, ensuring the system remained stable, functional and all performance parameters are met.
- **Software Integration:** Acsia was responsible for integrating software across three product lines:
- **Media Gateway Unit (MGU):** Managed the head unit without instrument cluster functionality.
- **Integrated Digital Cockpit (IDC):** Included all MGU features plus additional driver information.
- **Rear Seat Entertainment (RSE):** Provided entertainment options for rear seat passengers.

Challenges Overcome

- **Reverse Engineering:** Acsia had to reverse engineer the system due to the lack of documentation from the previous vendor, which they successfully accomplished.
- **High First-Time Fix Rate:** Achieved a 96% first-time fix rate during the maintenance phase, minimizing the frequency of recurring issues.

Business Outcome/Impact

Production Timelines

The OEM successfully met their production timelines, ensuring vehicle rollout as per the fixed date in 2023.

Improved Customer Experience

Enhanced overall architecture led to a better user experience.

System Health Improvement

Performance improvements and system health measures optimized the system as per OEM expectations.

Key Learning

Root Cause Analysis (RCA)

Improved RCA processes resulted in higher process efficiency and a higher first-time fix rate.

APSICE V Model

Acsia demonstrated the capability to handle the entire APSICE V model (both system and software) except for SYS 1 (elicitation stage) for instrument cluster projects for any OEM/Tier-I.

AUTOSAR Configuration

Optimization of system inputs and outputs.

Infotainment Lifecycle

Knowledge of the vehicle and infotainment lifecycle on IDC.

Wake-Up Reset and STR

Understanding of wake-up reset and Suspend to RAM (STR) in vehicle systems.

Display Issues

Addressing screen blackout, flickering, and link lost issues.

Diagnostic Commands

Improvement in diagnostic commands and responses in actual vehicles and test properties.

Software Flashing

Enhancements in software flashing time.

Secure Communication

Improvement of secure communication channels between master-slave connections in infotainment systems.

Expert Speak

Ajeesh Sahadevan
SME

"Taking over the project from where the previous vendor left off was a challenging task, especially with minimal documentation. However, our team's expertise in the digital cockpit and infotainment domain allowed us to reverse engineer the system effectively. We not only met but exceeded expectations, achieving a 96% first-time fix rate, which significantly reduced recurring issues and enhanced the overall user experience."

Hitha S P
Delivery Head

"Our commitment to excellence and proven track record were key factors in being chosen for this project. By owning the software integration and maintenance across the three product lines, we ensured seamless continuity and stability. The successful rollout of vehicles in 2023, meeting all production timelines, is a testament to our team's dedication and capability in managing complex automotive software projects."
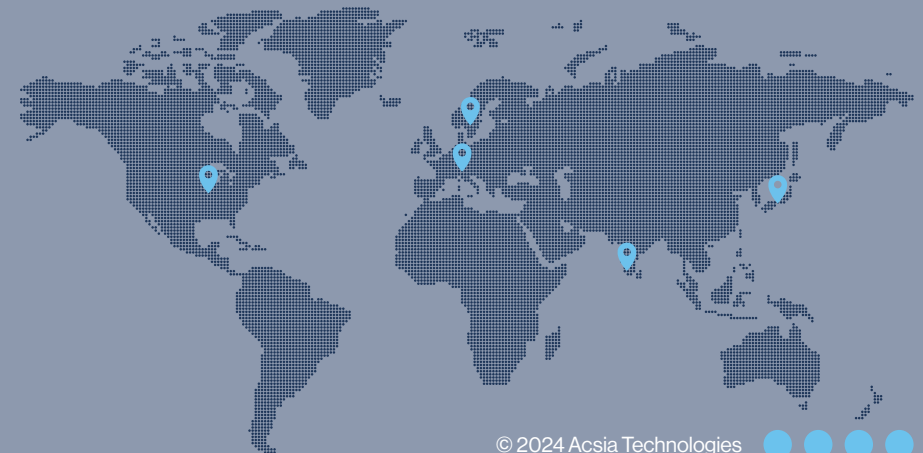
About Acsia Technologies

Acsia is a global leader in automotive software powering Digital Cockpits & Displays, e-Mobility, and Telematics. We use our expertise to develop solutions that simplify complex problems and create safer, sustainable, and more compelling driver and passenger experiences. With a presence across the United States, Germany, Sweden, Japan, and India, we collaborate with top carmakers and Tier-I suppliers.

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www.acsiatech.com | enquiry@acsiatech.com | (in) | (ig)

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