# Acsia

Technology that drives Tomorrow

Android-based RSE for a Global Luxury OEM with Third-Party App Store Integration

Find out how Acsia partnered with the Tier-I to develop an Androidbased Rear Seat Entertainment (RSE) system for a leading luxury carmaker, targeting the Chinese market with compatibility for Baidu's third-party app store and the Rest of the World markets.

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### **Technology & Business Landscape**

In the autumn of 2016, the automotive industry began to significantly change. Electric vehicles and autonomous driving technologies started becoming mainstream, leading to major advancements in car technology. This period also saw a shift in the in-car experience as leading Original Equipment Manufacturers (OEMs) began to incorporate advanced digital interfaces. This meant moving away from traditional mechanical controls to more sophisticated infotainment systems.

Platforms like Apple CarPlay and Android Auto started making interactions within vehicles more intuitive and connected, reflecting a broader trend where cars were becoming not just a means of transportation but a connected mobile environment integrating various digital aspects.

Amidst these technological advancements

The automotive industry was witnessing a shift in the in-car experience as leading OEMs began to incorporate advanced digital interfaces moving away from traditional mechanical controls. and changing consumer expectations, a leading Tier-I supplier, representing one of the largest luxury car OEMs, decided to develop the world's first Android-based Rear Seat Entertainment (RSE) system. This system was not only tailored for the Chinese market but also suitable for global use, and it uniquely included integration with a thirdparty Chinese app store, leveraging Baidu's extensive app ecosystem.

This initiative was ambitious and aimed to position the OEM as a leader in the luxury automotive segment, aligning with the industry's move towards more connected, user-centric vehicle environments. However, the project faced several challenges, including managing thousands of unique system requirements and coordinating a multinational team across different regulatory and technological landscapes.

### **Customer Problem Statement**

The project's goal was to create an Android-based Rear Seat Entertainment (RSE) system for a leading luxury carmaker, targeting the Chinese market with compatibility for Baidu's third-party app store and the Rest of the World markets. This system needed to meet growing consumer expectations for seamless connectivity and intuitive user interfaces like those found in smartphones.

### Challenges

#### Complex SW and System Requirements

The project involved around 10,000 customer requirements, including 3,000 ones specific to SW, requiring meticulous management, integration, and testing to maintain the luxury standard expected from the brand.

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#### Multi-national Collaboration

The development spanned seven countries, involving many suppliers and needed detailed coordination to handle the complexities of a globally distributed team.

#### Android in Automotive Infotainment

Customizing Android to work effectively with car-specific hardware, meeting industry standards, and ensuring security against cyber threats were significant challenges.

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#### Cybersecurity Concerns

The integration of connectivity technologies like Wi-Fi and Bluetooth brought a higher risk of security vulnerabilities, requiring strict security measures to protect against cyber threats.

#### The China Challenge

Integrating a third-party Chinese Appstore added complexity, particularly in modifying software architecture to ensure both system security and functionality within the tightly regulated market.

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### **Acsia Solution**

Acsia leveraged its extensive experience in developing infotainment systems for premium automotive brands to confidently manage this complex project, ensuring timely delivery of high-quality software.

#### Technical Proficiency in Android Systems

Acsia adapted Android for automotive use, developing custom APIs and middleware that allowed Android to communicate effectively with the vehicle's hardware systems.

#### Global Operational Capability

Acsia coordinated logistics and project management across multiple countries effectively, ensuring synchronized integration of various components.

#### Innovative Approach to Security

Acsia implemented highlevel security measures including secure boot processes and state-ofthe-art encryption, using tools like the Microsoft Threat Modelling tool to pre-emptively address potential security threats.

#### Comprehensive Service Offering

Acsia provided an all-inone solution covering all aspects of development from design to final testing, streamlining the development process and reducing project complexity.

#### Customized Integration for Chinese Market

The integration of a thirdparty Chinese Appstore was tailored to meet local regulations and technical complexities, ensuring secure and functional system architecture.

### **Business Outcome & Impact**

The successful delivery of the connected Android-based RSE system with third-party app store integration has significantly advanced the luxury car OEM's market position. The system not only met regulatory requirements but also exceeded consumer expectations for seamless connectivity and intuitive interfaces. Key outcomes include enhanced system security, innovative software architecture, streamlined integration and development processes, compliance with automotive standards, and efficient Android power management.

#### **Enhanced System Security**

Acsia successfully met 280 complex security requirements set by the OEM, safeguarding the infotainment system against potential cyber threats. By leveraging advanced tools like the Microsoft Threat Modelling tool, Acsia effectively identified vulnerabilities and implemented robust security measures, ensuring the protection of critical vehicle functions and customer data from unauthorized access.

#### Innovative Software Architecture

Acsia introduced a hypervisor architecture that allowed two operating systems to run on the same System on Chip (SoC). This innovation separated critical automotive applications from third-party apps, enhancing overall system reliability and security by isolating essential functions from less secure applications.

### **Streamlined Integration and Development Process**

Acsia handled software development, system integration, and testing, streamlining the customer's development process. This comprehensive approach reduced complexity and coordination efforts, potentially shortening the development timeline and lowering costs associated with managing multiple vendors.

## **Compliance with Automotive Standards**

Acsia adhered strictly to automotive industry standards through expert Android

customization and security enhancements. This ensured the infotainment system's functionality and safety, facilitating compliance with regulatory requirements crucial for the acceptance and success of automotive products in international markets.

#### Android Power Management in Automotive

Acsia has successfully enabled an efficient power management system by customizing Android to meet specific automotive power management requirements. This process included the development of custom native and Java applications to handle power triggers, manage wake locks, control display backlight, and handle shutdown processes, aligning with automotive standards.

## **Key Learning**

#### Complex Security Integration

#### Innovative Use of Advanced Technology

Early integration of robust security measures is essential, using advanced tools to anticipate and mitigate potential vulnerabilities. The use of a hypervisor to run multiple operating systems on the same hardware was a key innovation, enhancing both security and system stability.

#### Adherence to Regulatory and Compliance Standards

Ongoing education and compliance with automotive and cybersecurity standards are crucial, particularly in complex markets like China. Scalable and Flexible Software Architecture

Developing adaptable software architectures allows efficient customization to meet diverse market needs.

#### Enhanced Testing and Validation Processes

Robust testing frameworks are vital to ensure the system meets all operational standards, maintaining high reliability and performance.

### **Expert Speak**



Anil S VP Delivery

"By developing the world's first connected Android-based RSE system with third-party app store integration, we have set a new benchmark for in-car digital experiences. Our team's dedication to managing complex requirements and coordinating across multiple countries was instrumental in delivering this innovative solution. We are proud to have partnered with a leading luxury car OEM to bring this vision to life, enhancing the in-car experience for users globally."



Vasantharaj G VP Technology

"Integrating an Android-based infotainment system into a vehicle's environment posed unique challenges, particularly in terms of security and system optimization. Our expertise in customizing Android OS for automotive applications, coupled with our innovative approach to cybersecurity, enabled us to create a robust and user-friendly RSE system. It not only showcased our technical proficiency but also our ability to adapt and innovate in response to specific market needs, such as those in China."

#### 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.



