About the Client
The client is Japan’s leading technology group with presence in over 15 countries. This tier1 specialises in designing, manufacturing and diagnostics of embedded systems in small to medium production run vehicles.

Business & Technology Context
The Tier1 had to supply an AUTOSAR based Transmission Control Module (TCM) ECU (Engine Control Unit) to a Europe based OEM’s new production program. The existing ECU was designed on legacy architecture and the client wanted to migrate to AUTOSAR compliant ECU. Few legacy components were to be retained from the existing architecture. Therefore, the Japanese Tier-1 had to adopt an ECU architecture that contained a combination of AUTOSAR and non-AUTOSAR components. This led to a communication issue between different components. Tier-1’s expertise was in ECU development but migration required AUTOSAR software expertise. Tier-1 scouted for a partner who could cater to other requirements of TCM ECU like integration of OEM specific modules, development of complex device drivers, etc.

KPIT was a natural choice, as it is one of the largest AUTOSAR service providers with a proven track record of successfully implementing AUTOSAR and allied services to 20+ OEMs and Tier1s.

KPIT has successfully enabled AUTOSAR migration of complex ECUs for multiple production programs. Hence, the Tier1 trusted KPIT for this engagement.

KPIT’s Solution
After initial system analysis & feasibility study, KPIT experts designed an architecture that could seamlessly support AUTOSAR and non-AUTOSAR components.

KPIT had to re-architect the application to make it AUTOSAR compatible. The components of this re-structured application had to be integrated with Basic Software (BSW), Run Time Environment (RTE), and Microcontroller Abstraction Layer (MCAL).
One of the critical parts of this project was the way the application was split for CPU load balancing. Tier1’s large application was strategically split depending on its functionality and criticality into seven Operating System Tasks. This design helped reduce the processor load & thus the overall ECU performance.

KPIT also provided the following solutions:

- Development of Complex Driver for external solenoid, external EEPROM, external watchdog and integration
- Development of Flashloader
- Bootmode integration
- Development of Tier1 Specific ECU State Manager
- Configuration and Integration of Diagnostic Modules
- Integration with OEM Specific compatibility modules
- Complete Testing with tools provided by OEM

Key Metrics

| 120+ signals migrated | 450,000+ Application Source lines of code developed | 1000+ integration test cases executed | 4000+ test cases executed for OEM diagnostics |

Key Success Factors and Client Benefits

KPIT’s integration and migration services were the highlight of this project. Tier-1 found a single AUTOSAR success partner in KPIT with its comprehensive services around AUTOSAR basic software. This ensured that the AUTOSAR basic software was perfectly integrated with the migrated application software. It was not just the stack but the services that ensured success. After all AUTOSAR is all about execution.

About KPIT

KPIT Technologies (BSE: 532400; NSE: KPIT) is a fast growing Product Engineering and IT consulting partner to Automotive, Manufacturing and Energy & Utilities companies. A leader in technology solutions and services, KPIT partners with 200+ global corporations enabling them to become more efficient, integrated and innovative enterprises.