

TELIPORT

Script Your Future

Season 3

Case Study No: 2

AUTOMOTIVE



Team Details:

Team Name: **NEXUS**

Member 1: Lakshiya Sri K M

Member 2: Doneeswaran J

Member 3: Harish Kumar V (Team Lead)



Predictable Code Development for Service Oriented Application using GenAI

SOLUTION

Gen-AI & LLM-based SoA code generator with RAG + prompt engineering for multi-protocol vehicle services and predictive analytics dashboards by accelerating SDV development 40% and dynamic HMI dashboards

NOVELTY & KEY TECHNIQUES INCLUDED



GEN-AI + RAG ENGINE:

Uses **RAG+LLM** for **Semantic retrieval** using Fallback formatting



MULTI-PROTOCOL CODE GENERATION:

Unified framework generates **multiple language variants** from one spec



MISRA/ASPICE COMPLIANCE BUILT-IN

Safety standards embedded in code generation for **first-pass compliance**, eliminating **manual audits**.



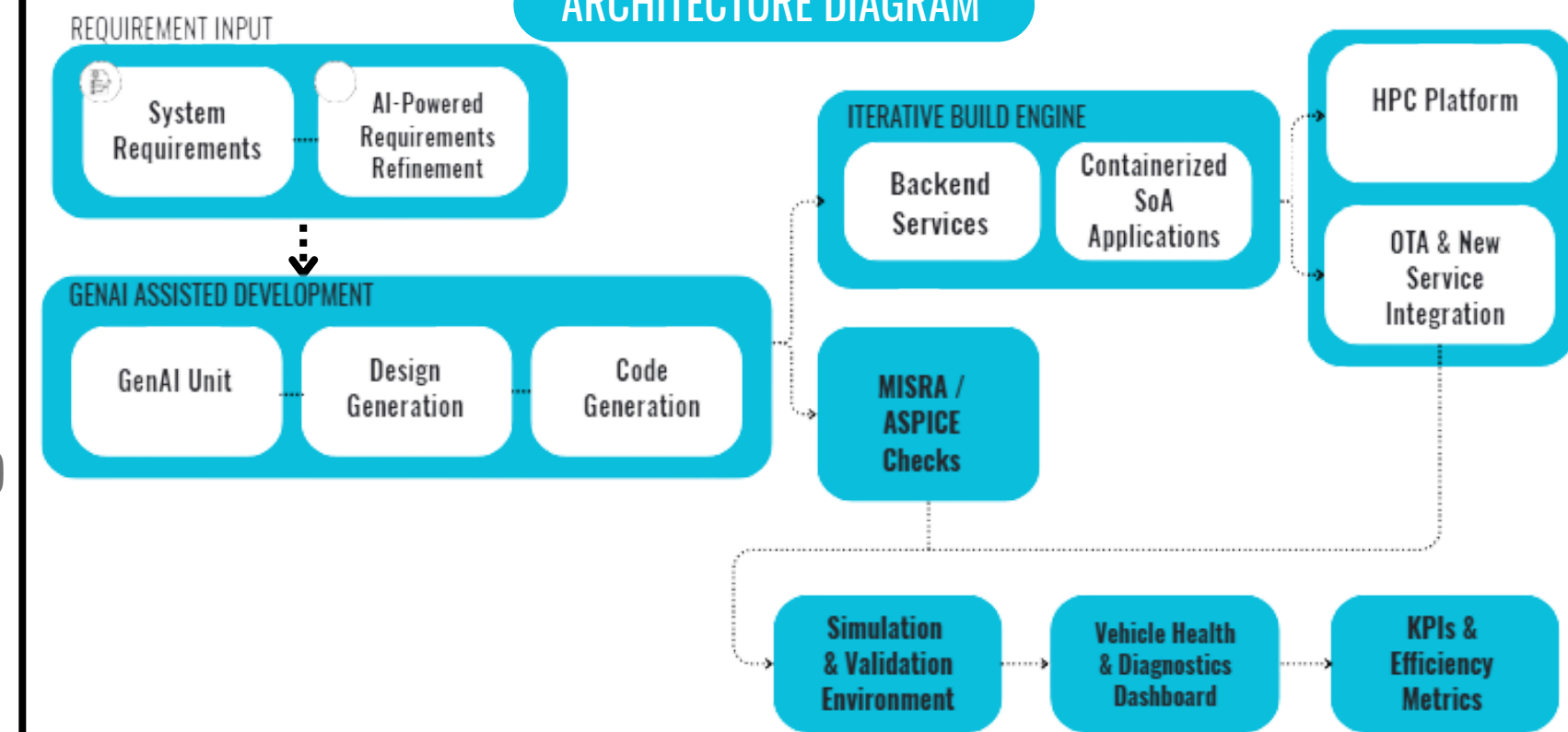
AI-BASED HMI DASHBOARD GENERATION

generate **production-ready dashboard code** without **manual UI development**.

TECH STACKS

- Frontend / HMI
 
- Backend / SoA:
 
- Simulation & Data:
CARLA(vehicle simulator)
- Testing & Compliance:
• MISRA • ASPICE

ARCHITECTURE DIAGRAM



KEY METRICS

40% **Faster Development** ↑ 95% **Code Accuracy** ↑ <50ms **Dashboard Update Latency** ↑

KPI METRICS

97.2% **Anomaly Detection Accuracy** ↑ 95% **Test Coverage Auto-Generated** ↑ OTA service integration in 5 minutes ↑

INPUT REQUIREMENTS

- Vehicle Type (ICE/ Hybrid/ EV variant)
- Automotive code samples
- Vehicle data schemas
- ASPICE guidelines
- Target Platforms
• C++ • KOTLIN • Android • Linux

Create dataset, document consisting all these info

Chat bot powered by RAG based LLM models

Feedback Loop: continuously improve recommendations

Engineer validates the SoA code, HMI, tests with CARLA simulation

Engineer validates the results

Results is as per standards and feasible sent for next phase

If results are inaccurate

OUTPUT

- SoA Services Code**
• C++ • Kotlin • Rust Service
- HMI Dashboard**
• React Native • Flutter UI code
- Test Suites**
• 95%+ code coverage with 200+ test cases
- Docker Configs**
• Containerized services (Deploy)
- Vehicle Health Demo**
• Dashboard (SoC, Tire Pressure)

DEMO

HMI VISUALIZATION DASHBOARD

Vehicle Health Dashboard

Real-time vehicle diagnostics and predictive analytics

Platform Workflow



Requirement Intelligence
NL Processing & Analysis



Service-Oriented Design
SOVD Compliant Services



Code Generation
C++, Rust, Android



Auto Test Generation
Unit & Integration Tests

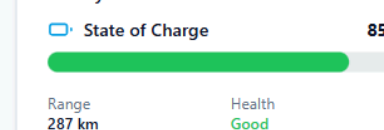


OTA Integration
Fleet Deployment

Speed



Battery Status



Tire Pressure

FL	FR
32	33
PSI	PSI
RL	RR
31	32
PSI	PSI

Development Time
↓ 40-60%

Engineering Effort
↓ 50%

Test Creation
↑ 70%

OTA Scalability
↑ Enhanced

MISRA/ASPICE
Compliant