Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	15 October 2022
Team ID	PNT2022TMID33247
Project Name	Vehicle performance analyzer
Maximum Marks	4 Marks

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

Example: **Modelling and performance analysis of vehicle**

Reference: **https://www.researchgate.net/figure/Vehicle-subsystem_fig4_351716419**

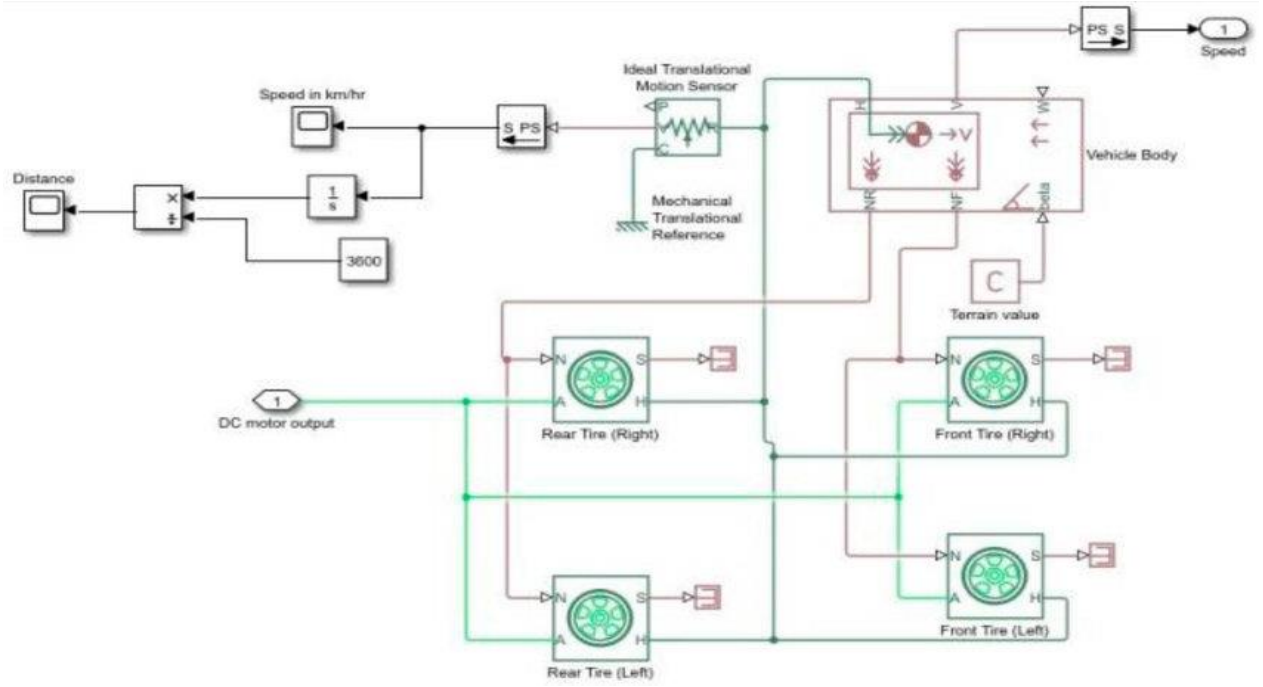

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Vehicle performance analyser employing an accelerometer (OBD-II system).	C, Java
2.	Application Logic-1	The system analyses the data of engine power about the consumption of fuel.	C,C++
3.	Application Logic-2	Application of ENN-3 for defect recognition of car engines	YOLOv3
4.	Application Logic-3	Automobile automatic shift system based on driving environment recognition.	C,C++
5.	Database	Fuel efficiency, Speed value parameters	MySQL
6.	Cloud Database	Cloud SQL automatically ensures your databases are reliable, secure, and scalable so that your business continues to run without disruption.	MySQL
7.	File Storage	Storage Transfer Service offers a highly performant, online pathway to Cloud Storage both with the scalability and speed you need to simplify the data transfer process.	Cloud storage
8.	External API-1	Route fuel-saving evaluation framework for estimating fuel advantages of alternative	Navigation API.
9.	External API-2	Real-world travel data for conventional vehicles (CVs) and hybrid electric vehicles (HEVs)	Google directions API.
10.	Machine Learning Model	Accurate vehicle acceleration prediction approaches can promote the development of ADAS and improve traffic safety.	Mixture of Hidden Markov Model.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: The client sends requests to the server for specific information and the server sends the response back to the client with the requested information. Cloud Server Configuration : Cloud testing is the process of using the cloud computing resources of a third-party service provider to test software applications.	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	To provide a set of APIs to build UI tests, the Spectatio framework implements app-specific interfaces and helpers while extending the existing standard helper class and importing the utility helper classes.	Technology of Opensource framework Application Programming Interface
2.	Security Implementations	Security is not a competitive offering – it is required for a connected car to work, and the firewall remains a vital component of a multilayer security approach.	To overcome these challenges, developers can implement AUTOSAR to streamline ECU software integration.
3.	Scalable Architecture	A continuous digital thread throughout vehicle development and manufacturing will enable the generation of accurate documentation directly from vehicle design data.	Computer-aided design.
4.	Availability	This project is to analyse vehicle status through microcontroller with help of external hardware device and sensors.	This project is designed with Microcontroller, LCD display, Temperature sensor, Pressure sensor, Fuel sensor, Speed sensor, SCU, Matrix keypad, Amplifier, and ADC.
5.	Performance	The objective of this project is to analyse the vehicle performance. Electronic devices do all part of task automatically and the technologies are embedded to it.	Microcontroller with help of external hardware device and sensors.

References:

https://frigateprojects.com/shop/projects/automobile/vehicle-performance-analyser/

https://www.researchgate.net/publication/327041841_Performance_Analysis_of_Vehicle-Specific_Methods_and_Sensors_for_Autonomous_Vehicles