Project Plan Validation Meeting
Team: KiutBois

1. **Project Vision**

Our vision is to revolutionize automotive education and enhance mechanical understanding by introducing an immersive AR VR Car Parts Simulation. We aim to create an interactive and realistic learning experience that enables students, automotive enthusiasts, and professionals to explore, dismantle, and comprehend the intricate workings of a car engine in a virtual environment.

We envisage our simulation as a comprehensive educational tool that crosses geographical boundaries to provide accessible, hands-on learning experiences for students and hobbyists all over the world. Our project seeks to empower the next generation of automotive professionals and enthusiasts by promoting curiosity, expanding understanding, and facilitating skill development in automotive engineering, hence fostering innovation and excellence in the automotive sector.

2. Project Objectives

a. Create an accurate and detailed virtual representation of a car engine, allowing users to interact with and explore its various components.
b. Facilitate a hands-on learning experience that bridges theoretical automotive knowledge with practical understanding through immersive AR VR technology.
c. Provide users with the tools to simulate real-world scenarios for troubleshooting, diagnostics, and understanding the inner workings of a car engine.
d. Ensure accessibility and usability across different devices and platforms to reach a wide audience of learners and automotive enthusiasts.
e. Enhance the educational landscape by delivering a valuable resource for automotive education, fostering curiosity, skill development, and innovation within the automotive industry.

3. Initial Requirement Models

User story

1. Explore on engine component.

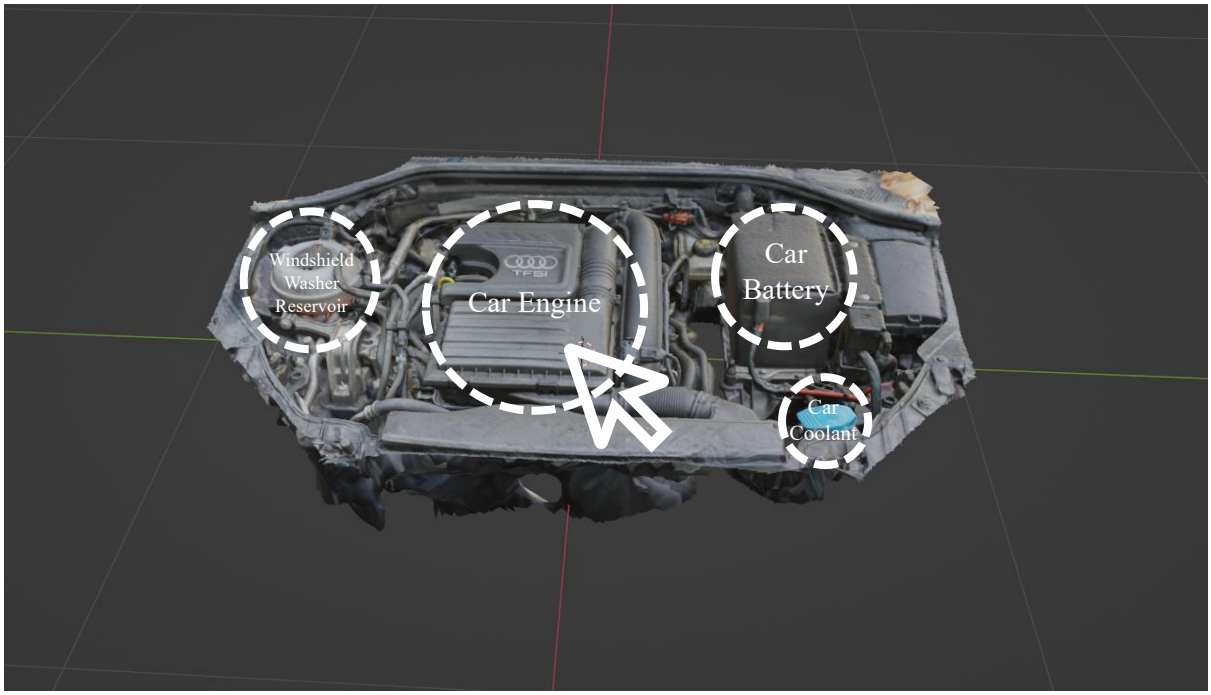

Figure 1.0: Overview of car engine

- As a student of automotive engineering, the requirement is to interactively explore a virtual car engine to gain comprehensive insights into its components and functionalities. An augmented or virtual reality (AR/VR) experience is preferred for closely inspecting automotive engine parts by clicking any parts of it.

2. Dismantle Engine for learning

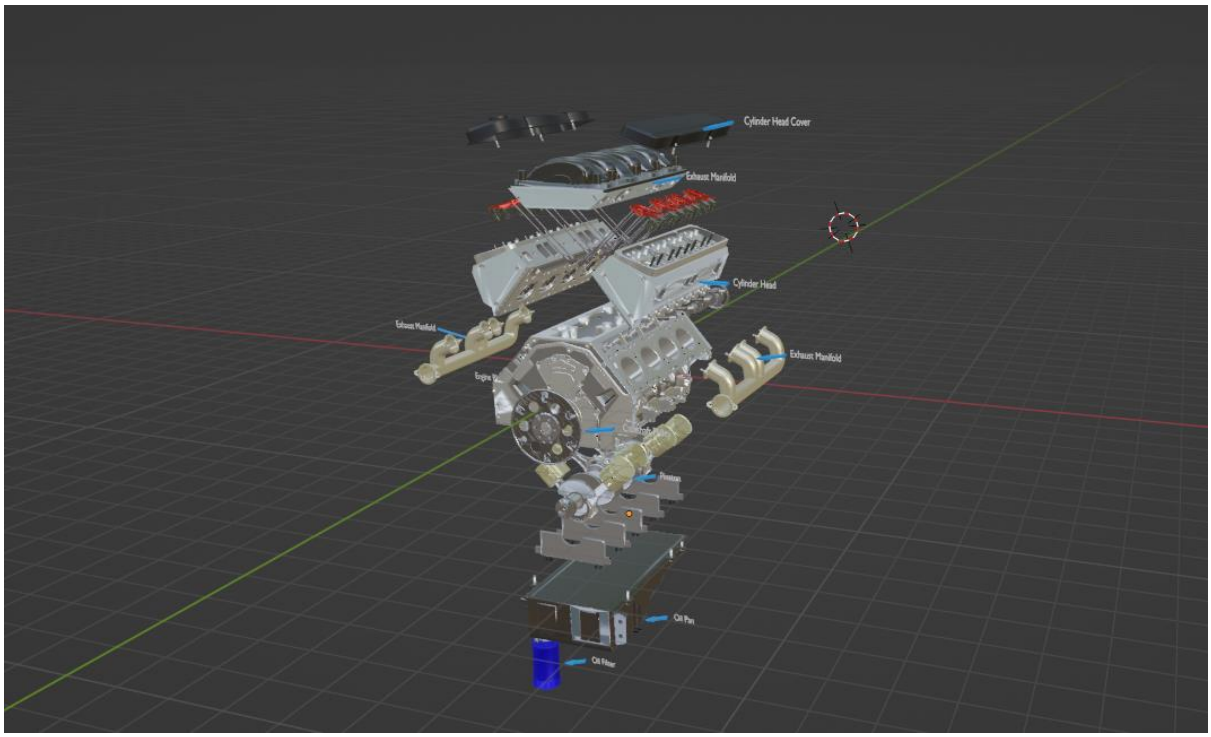

Figure 1.1: Disassembled Car Engine

- The requirement entails virtually disassembling an engine to learn the construction and disassembly of its constituent parts in an entertaining and informative manner. User can view all the detail parts of the car engine.

3. Car Parts Simulation

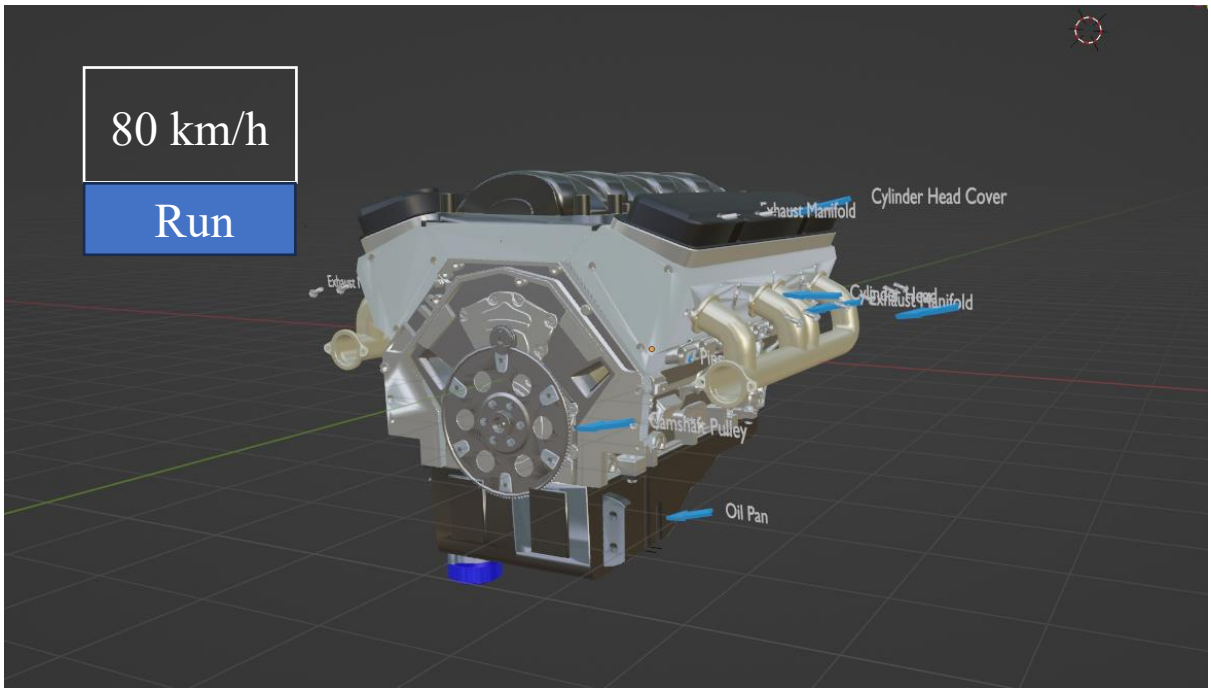

Figure 1.2: Car engine run in different speed

- The goal is to provide an AR/VR experience that provides a thorough understanding of the engine's operation. This includes the ability to mimic operating the car engine at different speeds while monitoring critical parameters such as coolant temperature, car battery level, and washer water level.

Use case diagram

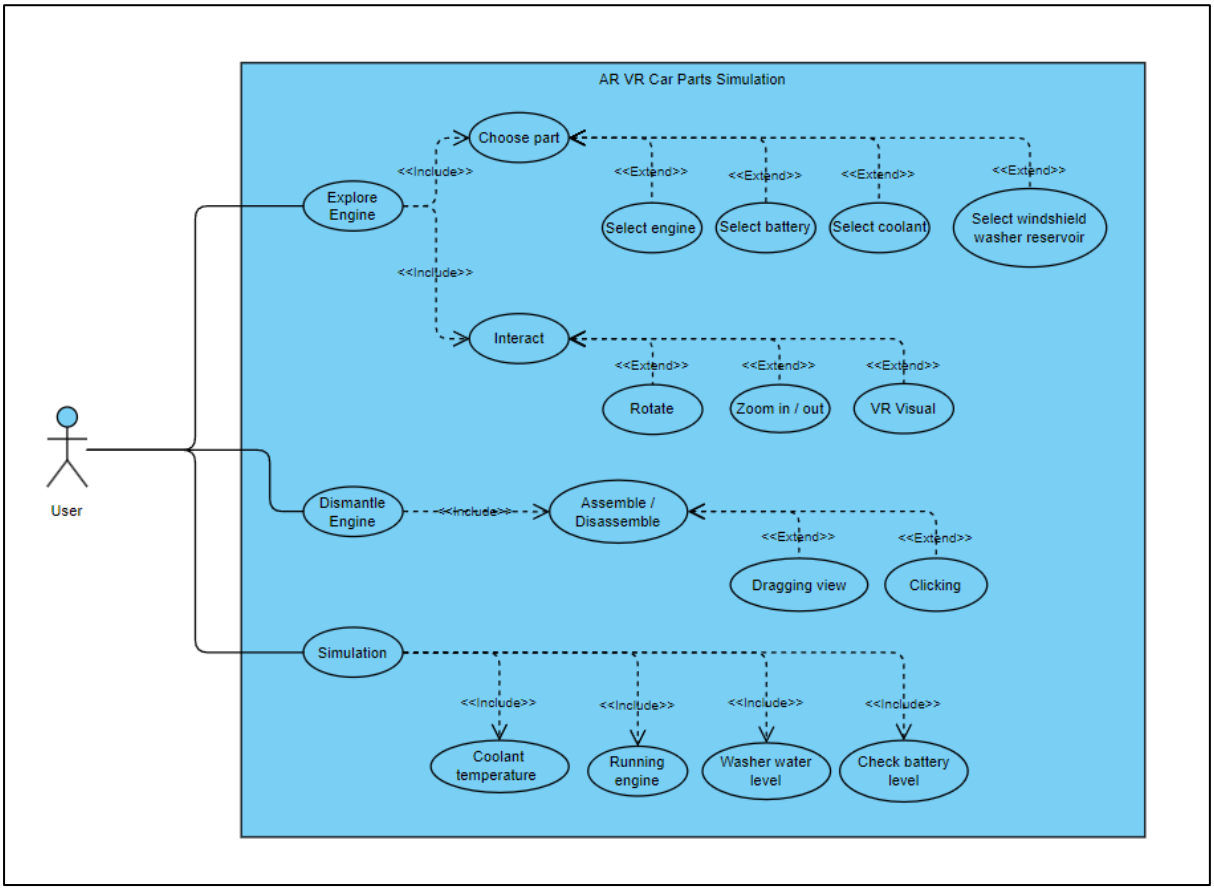

Figure 1.0: Use Case Diagram

- "Explore Engine" includes features like selecting different parts, selecting components, and interacting with the engine model.
- "Dismantle" refers to the activities of assembling and dismantling as well as interacting with views by clicking and dragging.
- "Simulation" encompasses various checks and activities related to running the engine, monitoring temperature, battery level, and washer water level.

Include relationship:

- “Explore engine” <<include>
    a. Choose part
    b. Interact
- “Dismantle engine” <<include>>
    a. Assemble/Disassemble
- “Simulation” <<include>>
    a. Coolant temperature
    b. Running engine
    c. Washer water level
    d. Check battery level

Extend relationship:

- “Choose part” <<extend>>
    a. Select engine
    b. Select battery
    c. Select coolant
    d. Select windshield washer reservoir
- “Interact” <<extend>>
    a. Rotate
    b. Zoom in/out
    c. VR visual

4. Initial sprint plan

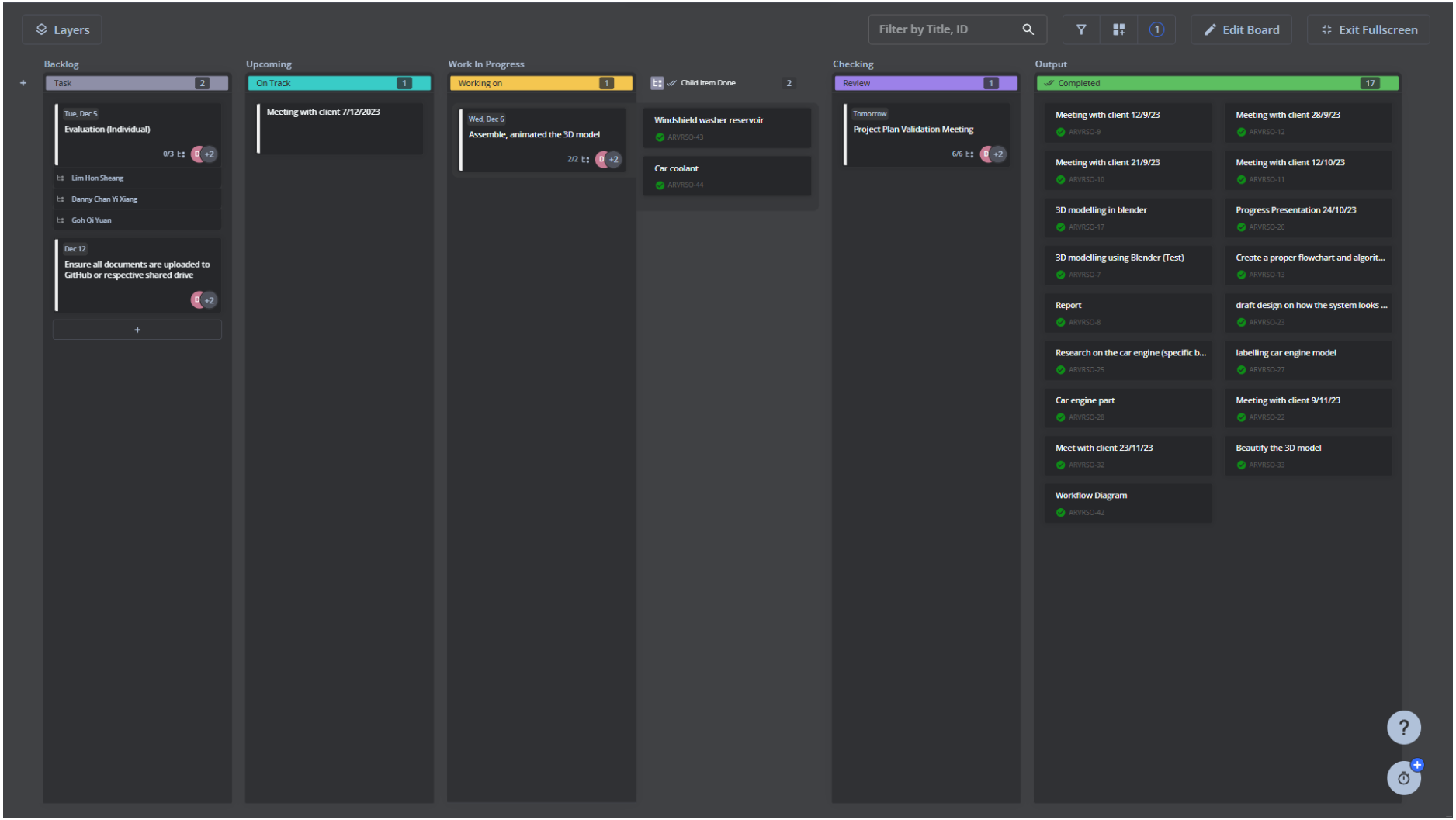

Figure 2.0: Kanban Board from Teamhood

Sprint duration: 3 months

Development Tasks by Team

a. Model Development:
   - Create 3D models for Car engine overview, Engine, Battery, Coolant system, and Windshield washer reservoir.
   - Ensure accurate representation of each component with appropriate details.

b. Animation Development:
   - Develop animations for assembling and disassembling the car engine components.
   - Implement labelling functionalities for each part.
   - Create an animation for the Battery level indicator functionality.

What Will Be Developed

a. 3D Models:
   - Car engine overview showing the layout and main components.
   - Detailed models for the Engine, Battery, Coolant system, and Windshield washer reservoir.

b. Animations:
   - Assemble and disassemble animations for the engine components.
   - Labelling feature to highlight and display part names when interacted with.
   - Battery level indicator animation to demonstrate its functionality.

5. Risk management plan

Likelihood impact	High	Moderate	Low
Time consuming		/	
Reputational risk			/
Stakeholder's risk		/	
Hardware compatibility	/		
Lack of resources	/		

- Time consuming - Complexity of the 3D model will bring difficulty in developing the application in time.
- Reputational risks - unable to develop the application on time will bring risks to organization's image and perception.
- Stakeholder risks - miscommunication between the students and company results in delay of development.
- Hardware compatibility - Only capable of running on powerful laptops with suitable GPU and CPU.
- Lack of resources - Lack of resources such as 3D models to integrate with the application.

Risk Register

Risk Description	Impact Description	Impact level (1-5)	Probability level (1-5)	Priority level
Unable to complete models on-time	Less model than expected to present during presentation	4	2	8
Hardware unable to support the 3D models	Unable to develop the 3D models and render in personal PC	5	3	15
Misunderstanding during communication with company	3D models developed are not met with the requirement	4	1	4
3D models file not saved and lost	Need to redo all the 3D models due to file lost	5	1	5
Lacks of 3D models resources	Need to develop our own 3D models	4	3	12

6. Communication plan

Objective: Ensure clear and consistent communication among team members and stakeholders.
Goal: Foster transparency, collaboration, and timely information exchange.

Stakeholders:
Internal Stakeholders:

a. Scrum master
b. Client liaise
c. Technical lead

External Stakeholders:

a. Siliconmax Technology

<u>Communication Strategies</u>

1. Communication Channels:
   a. Internal Team Communication:
      - Slack for daily updates, queries, and informal discussions.
      - Weekly team meetings to discuss progress and challenges.

   b. Stakeholder Updates:
      - Bi-weekly project progress updates through online or physical meetings.

2. Document Sharing and Collaboration:
   a. SharePoint for storing and sharing project documents, models, and animations.
   b. Teamhood to keep track of the progress.

3. Regular Updates:
   a. Weekly progress internal updates via Teamhood channel to keep the team informed about individual tasks and overall project status.
   b. Bi-weekly meetings with stakeholders summarizing progress, achievements, and any roadblocks encountered.

4. Feedback Mechanisms:
   a. Open communication channels (email) for continuous feedback and suggestions from team members and stakeholders.