Project Title:

AutoSage App Using Gemini Flash

Team Name:

Bot Battle

Team Members:

Akanksha Bandi
K. Sri Karuna Reddy
K. Manya Sree
D. Shiva Sohanasri

Phase-1: Brainstorming & Ideation

Objective:
Develop an AI-powered vehicle expert tool using Gemini Flash to help users compare and analyse vehicle specifications, reviews, and eco-friendly options

Key Points:

1. **Problem Statement:**

- Users face challenges in accessing reliable, up-to-date, and comprehensive information about two-wheelers and four-wheelers, making the purchase decision complex and time-consuming. They also require expert guidance on vehicle maintenance and eco-friendly options.
- The absence of a centralized platform offering detailed comparisons, reviews, and sustainability insights highlights the need for an AI-powered solution that simplifies vehicle research, boosts user confidence, and supports informed decision-making.

2. **Proposed Solution:**

   To address these challenges, we propose developing AutoSage, an AI-powered vehicle expert tool utilizing Gemini Flash. This intelligent platform will help users make well-informed decisions by providing Comprehensive Vehicle Comparisons, Reliable Reviews & Insights, Eco-Friendly Recommendations and Maintenance Guidance

3. **.Target Users:**

   - **Prospective Vehicle Buyers** – Individuals looking to purchase two-wheelers or four-wheelers who need reliable comparisons, expert reviews, and eco-friendly options.

   • **Existing Vehicle Owners** – Users seeking maintenance tips, performance optimization, and sustainability insights for their current vehicles.

   • **Eco-Conscious Consumers** – People interested in exploring electric, hybrid, and other environmentally friendly vehicle options.

   • **Automobile Enthusiasts** – Users passionate about the latest vehicle technologies, trends, and market updates.

   • **Fleet Managers & Businesses** – Organizations managing multiple vehicles that require efficient comparison and maintenance insights for cost-effective operations.

4. **Expected Outcome:**

   AutoSage will empower users with AI-driven vehicle comparisons, maintenance insights, and eco-friendly recommendations, simplifying decision-making and enhancing user confidence. By providing fast, accurate, and personalized information, it will save time, promote sustainability, and improve overall user experience.

Phase-2: Requirement Analysis

Objective

To identify and define the key technical, functional, and non-functional requirements necessary for developing AutoSage, ensuring seamless AI-powered vehicle analysis and user engagement. This phase will outline the data sources, AI capabilities, user interface design, and system infrastructure needed for optimal performance.

Key Points:

1. **Technical Requirements:**

- **Programming Language:** Python
- **Backend:** Google Gemini Flash API
- **Frontend:** Streamlit Web Framework
- **Database:** Not required initially (API-based queries)

2.Functional Requirements:

Vehicle Search & Comparison – Enable users to search and compare two-wheelers and four-wheelers based on specifications, reviews, and pricing.
AI-Powered Insights & Recommendations – Utilize **Gemini Flash** to generate intelligent insights, summarize reviews, and suggest the best vehicle options.
Eco-Friendly Vehicle Suggestions – Provide recommendations on electric, hybrid, and other sustainable vehicle options with environmental impact analysis.
Maintenance Assistance – Offer AI-driven tips, reminders, and troubleshooting guidance for vehicle upkeep.
Real-Time Market Updates – Fetch and display the latest trends, prices, and user reviews from trusted sources.
User Queries & Chatbot Support – Integrate an AI-powered chatbot to assist users with vehicle-related questions and recommendations.
Interactive UI/UX – Design a user-friendly interface with intuitive navigation, dynamic filters, and visual comparisons.

3. Constraints & Challenges:

Data Accuracy & System Performance – Ensuring reliable, up-to-date vehicle data, seamless API integration, and real-time AI-driven insights while maintaining scalability, security, and responsiveness.

Phase-3: Project Design

Objective:

To define the system architecture, user interface, and AI integration for AutoSage, ensuring seamless functionality, scalability, and an intuitive user experience.

Key Points:

- **System Architecture** – Designing a scalable and efficient architecture integrating Gemini Flash, external APIs, and a secure database.

- **AI Integration** – Implementing AI-driven vehicle analysis, comparison, and recommendation features for accurate insights.

- **User Interface (UI/UX)** – Creating an intuitive, responsive, and visually appealing design for seamless navigation and interaction.
- **Data Flow & Processing** – Structuring how user queries are processed, data is fetched, and AI generates insights in real time.

Phase-4: Project Planning (Agile Methodologies)

Objective:

Break down development tasks for efficient completion.

Sprint	Task	Priority	Duration	Deadline	Assigned To	Dependencies	Expected Outcome
Sprint 1	Environment Setup & API Integration	⍰ High	3 hours (Day 1)	Mid of Day 1	Sohana,Manya	Google API Key, Python, Streamlit setup	API connection established & working
Sprint 1	Frontend UI Development	⍰ Medium	2 hours (Day 1)	Mid of Day 1	Karuna,Akanksha	API response format finalized	Basic UI with input fields
Sprint 2	Vehicle Search & Comparison	⍰ High	3 hours (Day 1)	End of day 1	Manya	API response, UI elements ready	Search functionality with filters
Sprint 2	Error Handling & Debugging	⍰ High	1.5 hours (Day 1)	End of day 1	Akanksha,	API logs, UI inputs	Improved API stability
Sprint 3	Testing & UI Enhancements	⍰ Medium	1.5 hours (Day 2)	Mid-Day 2	Entire team	API response, UI layout completed	Responsive UI, better user experience
Sprint 3	Final Presentation & Deployment	⍰ Low	1 hour (Day 2)	Mid of day 2	Entire Team	Working prototype	Demo-ready project

Sprint Planning with Priorities

Sprint 1 – Setup & Integration (Day 1)

(High Priority) Set up the environment & install dependencies.
(High Priority) Integrate Google Gemini API.
(Medium Priority) Build a basic UI with input fields.

Sprint 2 – Core Features & Debugging (Day 1)

(High Priority) Implement search & comparison functionalities.
(High Priority) Debug API issues & handle errors in queries.

Sprint 3 – Testing, Enhancements & Submission (Day 2)

(Medium Priority) Test API responses, refine UI, & fix UI bugs.
(High Priority) Final demo preparation & deployment

Phase-5: Project Development

Objective:

Implement core features of the AutoSage App.

Key Points:
1. Technology Stack Used:
○ Frontend: Streamlit
○ Backend: Google Gemini Flash API
○ Programming Language: Python
2. Development Process:
○ Implement API key authentication and Gemini API integration.
    o Develop simple GUI using Streamlit.
○ Develop vehicle comparison and maintenance tips logic.
○ Optimize search queries for performance and relevance.
3.Challenges & Fixes:
Challenge: Formatting Inconsistent Data for Comparison Tables
Fix: Standardize **vehicle attributes** (e.g., normalizing feature names) to ensure a clear and structured comparison.
Challenge: Difficulty in Displaying Data in a User-Friendly Table
Fix: Use **dynamic table generation** with proper alignment, highlighting key differences.
Challenge: Handling API Failure
Fix: Using fallback values

Phase-6: Functional & Performance Testing

Objective:

Ensure that the AutoSage App works as expected.

Test Case ID	Category	Test Scenario	Expected Outcome	Status	Tester
TC-001	Functional Testing	Query “Electric 4-wheelers under ₹10 lakh	Relevant budget cars should be displayed.	✓ Passed	Akanksha
TC-002	Functional Testing	Query "Motorcycle maintenance tips for winter"	Seasonal tips should be provided.	✓ Passed	Karuna
TC-003	Performance Testing	API response time under 500ms	API should return results quickly.	⚠ Needs Optimization	Sohana
TC-004	Bug Fixes & Improvements	Fixed incorrect API responses.	Data accuracy should be improved.	✓ Fixed	Manya Sree
TC-005	Final Validation	Ensure UI is responsive.	UI should work on desktop.	✅ Passed	Entire team