# THE Revolutionizing Electric Vehicle Assistance: AI-Powered Solutions for Breakdown Challenges with Electric Vehicles
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Project Proposal Report

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**DECLARATION**

I declare that this is my own work, and this proposal does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other university or Institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

| **Name** | **Student ID** | **Signature** |
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Signature of the Supervisor                                        Date

(Ms. Sanika Wijayasekara)

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## ABSTRACT

In the rapidly growing landscape of electric vehicles (EVs), certain regions like Sri Lanka face a lack of adoption due to barriers such as limited knowledge, scarcity of mechanics, and the unavailability of spare parts. This grant outlines a transformative solution aimed at mitigating the inconveniences of EV breakdowns by introducing a groundbreaking conversational AI chatbot for vehicle breakdown assistance. [1] [2] By empowering drivers with prompt and accurate information about EV faults, the chatbot bridges knowledge gaps and facilitates informed decisions. Leveraging meticulously curated datasets, an advanced AI model scrutinizes breakdown scenarios and provides tailored solutions, while real-time updates ensure relevancy for an array of EV models. The primary mission is to bolster driver safety and operational efficiency on the road, offering comprehensive support for quick diagnosis and resolution of breakdown issues. This proposal underscores a research imperative in developing specialized chatbots for EVs, addressing distinctive breakdown scenarios that existing solutions overlook. It calls for the integration of real-time data on the latest EV models to provide precise assistance, requiring sophisticated AI models for intricate fault analysis and personalized recommendations. The challenge of ensuring a seamless user experience and natural language processing also warrants further exploration, alongside the creation of chatbots that seamlessly link with emergency services for prompt assistance during critical situations. Ultimately, this research aims to fill a crucial gap by equipping EV drivers with an innovative, cost-effective, and personalized solution that revolutionizes the way breakdowns are managed, fostering a smoother transition to a sustainable transportation future.

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| **Abbreviation** | **Description** |
|---|---|
| AI | Artificial Intelligence |
| ML | Machine Learning |
| EV | Electric Vehicles |
| AML | Auto Machine Learning |
| CNN | Convolutional Neural Network |
| ICE | Internal Combustion Engines |
| SDLC | Software Development Life Cycle |
| WBS | Work Breakdown Structure |

## 1. INTRODUCTION

### 1.1 Background & Literature survey

The advent of electric vehicles (EVs) has ushered in a new era of sustainable transportation, promising reduced emissions and dependence on fossil fuels

Electric vehicles (EVs) have emerged as a sustainable and environmentally friendly alternative to traditional internal combustion engine (ICE) vehicles. Unlike ICE vehicles that rely on fossil fuels, EVs are powered by electricity stored in rechargeable batteries. This paradigm shift in transportation technology brings numerous advantages, including reduced greenhouse gas emissions, lower operating costs, quieter operation, and potential energy independence. However, along with these benefits come unique challenges related to EV technology, maintenance, and breakdown management.[1][2]

The transition from ICE vehicles to EVs is gaining momentum globally due to their reduced environmental impact. EVs produce zero tailpipe emissions, contributing to cleaner air and a reduction in overall carbon footprint. Additionally, EVs offer quieter and smoother operation, improved energy efficiency, and lower fueling costs. These advantages have prompted a growing number of consumers to consider EVs as a viable transportation option.

Despite the advantages, the adoption of EVs is not yet on par with ICE vehicles. According to the International Energy Agency (IEA), in 2020, EVs accounted for around 4.6% of global car sales, indicating that ICE vehicles still dominate the market. However, this trend is expected to change as technology improves and charging infrastructure becomes more widespread.

EVs introduce a distinct set of components and technologies, leading to a different set of potential breakdown scenarios compared to ICE vehicles. Some common faults in EVs include issues with the battery system (capacity degradation, charging problems), electric motor malfunctions, power electronics failures, and software-related glitches. As EV technology evolves, breakdown management becomes a critical consideration, particularly due to the unique nature of EV components.

When an EV breaks down, users often encounter challenges related to diagnosis, immediate assistance, and availability of expertise. Unlike ICE vehicles, where drivers and technicians are more familiar with the internal combustion engine, diagnosing and addressing faults in EVs can be more complex. This complexity can lead to longer downtimes and inconvenience for users. Furthermore, the scarcity of EV-specific expertise and repair facilities adds to the difficulties faced by EV users during breakdown situations.

To address these challenges, we propose the development of an AI-based conversational chatbot tailored for EV breakdown assistance. This chatbot would leverage artificial intelligence and natural language processing to engage in real-time dialogue with users experiencing EV breakdowns. By gathering information about the symptoms and context of the breakdown, the chatbot would analyze the data and recommend appropriate solutions.

The advantages of using an AI-based conversational chatbot for EV fault detection are numerous. Firstly, the chatbot can tap into extensive EV manufacturer datasets, ensuring accurate and relevant advice based on specific EV models. Secondly, the chatbot's ability to engage in dynamic conversations means it can ask clarifying questions to better understand the problem, facilitating accurate diagnosis. Thirdly, the chatbot can offer immediate assistance, reducing downtime and inconvenience for the user. Finally, continuous updates to the chatbot's knowledge base ensure that it remains up to date with the latest EV technology and troubleshooting techniques.

While existing chatbots for vehicle fault detection and breakdown assistance are available, they predominantly target ICE vehicles. For instance, Smith et al. (2019) developed an AI-based breakdown assistance system for ICE vehicles. However, these systems lack the tailored expertise and specific knowledge required to effectively diagnose and assist with EV breakdowns.

In conclusion, the rise of electric vehicles presents a paradigm shift in transportation, driven by their environmental benefits and technological advancements. Yet, EVs introduce a unique set of challenges in breakdown management, owing to their distinct components and technology. Our proposed AI-based conversational chatbot seeks to bridge this gap by providing tailored, real-time assistance to EV users during breakdown situations. By leveraging AI, manufacturer datasets, and real-time dialogue, this solution aims to enhance the reliability, convenience, and user experience of EVs on the road.

## 1.2 Research Gap

The realm of vehicle breakdown assistance chatbots presents several notable research gaps, particularly in the context of electric vehicles (EVs). While existing solutions primarily target traditional internal combustion engine vehicles, there is a substantial lack of focus on developing specialized chatbots tailored explicitly for EVs. These vehicles possess distinct characteristics, components, and potential breakdown scenarios that necessitate customized approaches. This gap signifies the need for dedicated research efforts to address the unique challenges posed by EV breakdowns.

One glaring research gap pertains to the integration of real-time data into chatbot functionality. The current landscape lacks chatbots capable of efficiently incorporating up-to-date information about the latest electric vehicle models. Ensuring accuracy in diagnosis and assistance demands real-time integration of evolving EV technologies and models. Bridging this gap is crucial to provide users with relevant and precise recommendations for their specific vehicle type.

Moreover, existing fault analysis capabilities within chatbots remain inadequate when applied to complex electric vehicle breakdowns. There is a pressing need for advanced AI models that can adeptly decipher intricate EV system failures and offer tailored solutions. As EVs involve intricate electrical and electronic components, addressing this gap requires AI systems capable of comprehending the intricacies of these systems, enhancing the potential for effective breakdown analysis.

User experience and natural language processing represent another critical research gap. While chatbots are becoming more prevalent, achieving a truly seamless user experience and natural language understanding remains challenging. Creating chatbots that accurately comprehend user queries, discern context, and respond in a manner akin to human interaction remains a gap. Tackling this challenge involves refining natural language processing algorithms to ensure accurate, context-aware responses, thereby elevating the overall user experience.

The integration of chatbots with emergency services presents yet another research gap. Developing chatbots that seamlessly connect users with emergency response systems during breakdowns is a critical need. Enabling timely and efficient assistance in emergencies through AI-powered chatbots requires intricate coordination and integration, demanding focused research and development.

Furthermore, addressing user skepticism and concerns regarding chatbot reliability constitutes a significant research gap. Despite AI advancements, users may still harbor doubts about relying on chatbots for crucial breakdown situations. Investigating and enhancing the trustworthiness and validation of chatbot recommendations is essential to instill user confidence in utilizing these AI-driven solutions.

In summary, the research gaps in the domain of vehicle breakdown assistance chatbots for electric vehicles are multi-faceted. Tailoring solutions to EVs, integrating real-time data, improving fault analysis capabilities, refining user experience, seamless emergency services integration, and enhancing trustworthiness collectively represent critical avenues for research and innovation in this evolving field.

The research “A” depicts that chatbot is a great conversational tool. The application is designed to deliver accurate responded in small amount of time. It reduces the load of the responses by employing an expert system, provider can give solution directly. This was created for users to save time when seeking advices from mechanics and experts while electric vehicle breakdown. Here we implement an application that can extract the keywords from user query using the TF-IDE and N-gram. Each term is given less weight to get exact response to the query. The web interface can store user input queries. By providing user protection, character integrity and retrieving recommendations in line with questions. The application is empowered in terms of security and efficacy. [3]

The research “B” depicts a new platform for obtaining electric vehicle fault detection services is emerging. The proof is the rise in publicly accessible chatbot that needs to actively participate in the delivery of services for prevention, diagnosis and repair. This article delves into human-AI interface components and AI automation transparency and decision making to examine how these new chatbots address design issues pertinent to the provision of vehicle breakdown services. [4]

Research "C" highlights that Chatbots are user-friendly tools usable by anyone capable of typing in their native language via mobile or desktop platforms, as observed in various sources. These chatbots offer tailored vehicle fault diagnoses based on the reported issue. Future enhancements could involve additional parameters like fault location, duration, severity, and comprehensive descriptions, thus improving fault recognition and diagnosis. The implementation of personalized vehicle assistants predominantly leverages AI algorithms and training data, enabling users to access recommendations with internet-connected devices. Integration of voice communication and image uploads is also feasible. [10]

| Features | Research A | Research B | Research C | Proposed System |
| --- | --- | --- | --- | --- |
| Conversational Chatbot | X | X | X | ✓ |
| Availability of personalized solutions | ✓ | ✓ | X | ✓ |
| User Friendly Platform | X | X | ✓ | ✓ |
| Availability of a knowledge base | ✓ | ✓ | ✓ | ✓ |
| Chatbot framework | X | | | ✓ |
| Ability to ask to follow back questions | ✓ | X | ✓ | ✓ |
| Using RASA | X | X | X | ✓ |
| Updating Knowledgebase Easily | X | X | X | ✓ |
| Technology Used | N-GRAM | - | NLP/RNN | NLP/RNN |

### 1.3 Research Problem

The current challenge in electric vehicles (EVs) lies in the lack of real-time fault diagnosis when they break down on the road. This gap results in drivers being unsure about the specific issue and the necessary actions to take. To address this, a proposed solution involves the integration of a conversational AI chatbot equipped with a comprehensive knowledge base.

The chatbot would act as an instant troubleshooting companion, accessible via smartphone or in-car interface. By employing advanced diagnostic algorithms and leveraging a database of common EV issues, the chatbot would interact with the driver, asking targeted questions about the symptoms and conditions leading to the breakdown. Through personalized conversations, it would swiftly pinpoint potential problems and recommend immediate actions, such as rebooting certain systems, checking specific components, or contacting roadside assistance.

This solution offers cost-effectiveness as it reduces the need for towing or unnecessary repairs. Moreover, the personalized nature of the chatbot's responses enhances user experience and minimizes downtime. By harnessing real-time data and AI-driven insights, EV drivers can make informed decisions promptly, ensuring smoother journeys and contributing to the wider adoption of eco-friendly transportation.

## 2. OBJECTIVES

### 2.1 Main Objectives

The main objective of this initiative is to develop an advanced AI chatbot tailored for electric vehicle breakdown assistance. This chatbot will empower drivers by promptly interpreting details provided by them regarding the nature of the fault. By leveraging these insights, the chatbot will effectively categorize the fault, enabling it to furnish precise guidance on the necessary actions to undertake. This innovative solution not only fills the existing gap in EV breakdown support but also equips drivers with the know-how to navigate such situations seamlessly. Ultimately, the project seeks to enhance both the safety and efficiency of electric vehicle operation, fostering their adoption in regions like Sri Lanka.

### 2.2 Specific Objectives

- Research and gathering information on the EV common faults.
- Creating a knowledge base of fault characteristics related to each fault.
- Pre-processing and cleaning the data to prepare it for AI modeling.
- Training an AI model on the database to identify patterns and relationships.
- Evaluating the performance of the AI model on a validation set.
- Fine-tuning the model to improve its accuracy.
- Implementing the AI model in a mobile application.
- Verifying the accuracy and validity of the suggestions made by the chatbot.
- A conversational AI chatbot that allows users to text and receive solutions.

## 3. METHODOLOGY

The suggested solution aims to assists in EV fault identification and provide recommendations based on user data provided through the chat. To achieve this, conversational AI chatbot will be implemented as a user-friendly tool for individuals to obtain customized solutions and guidance through text. The chatbot will obtain data from a comprehensive knowledge base containing information about the faults to address user inquiries.

### 3.1 System Architecture

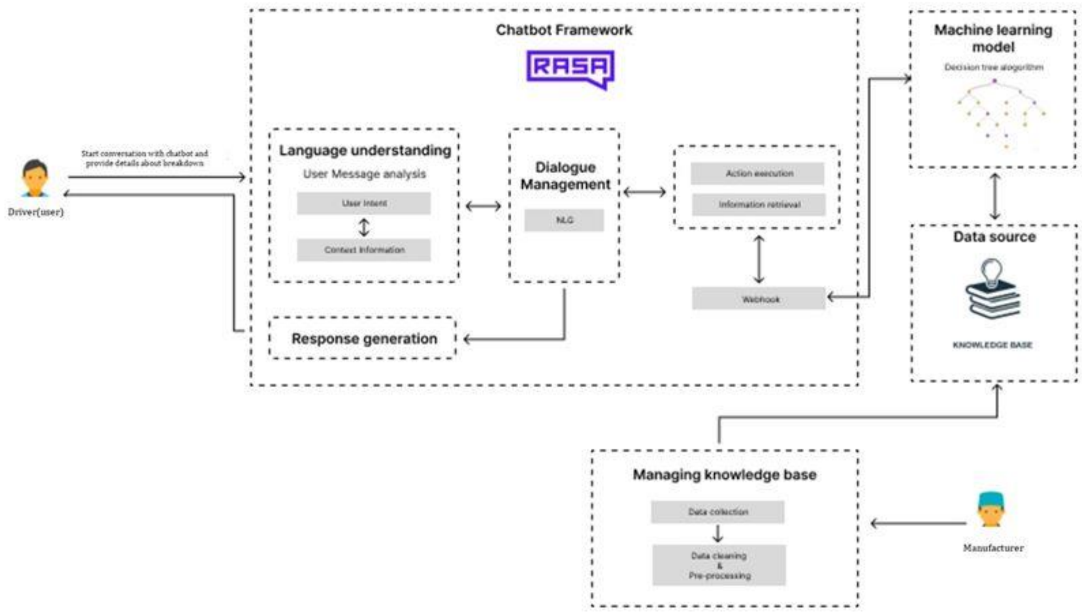


*Figure 1:System Architecture*

Developing a chatbot capable of addressing driver inquiries about vehicle issues and offering relevant suggestions involves a multi-faceted strategy. One avenue entail leveraging the capabilities of natural language processing (NLP) technologies. This empowers the chatbot to comprehend the everyday language employed by drivers, subsequently formulating responses that mirror human-like interaction.

Moreover, the integration of machine learning algorithms comes into play. These algorithms facilitate the chatbot's progressive enhancement of its responses through continuous learning from the input it acquires. This iterative learning process empowers the chatbot to evolve its effectiveness in addressing driver concerns about vehicle faults and furnishing appropriate recommendations. [11]

| | |
|---|---|
| **Technologies** | React Native, Expo, Python, TensorFlow, Node Server |
| **Techniques** | Intent Recognition, Entity Extraction [5], Dialogue Management, Machine Learning Model, Knowledge Base, Sentiment Analysis, Personalization |
| **Algorithms** | Recurrent Neural Networks (RNN) [6] |
| **Architectures** | RASA [7] |

*Table 1:Technologies and techniques used*

### 3.1.1 Software solution

The Software Development Life Cycle (SDLC)[8] [9] constitutes a methodical and organized route toward software creation, intended to guarantee the precision and uniformity of code. Within the traditional realm of software development, alterations in requirements frequently result in developers being incapable of revisiting prior stages. Consequently, they find themselves obligated to complete all subsequent phases in a sequential manner. Nevertheless, the incorporation of agile methodology within the SDLC introduces heightened adaptability for developers in the face of evolving requisites. This approach enables them to more flexibly accommodate changes while navigating the software development process.

Scrum, as a methodology, underscores collaboration, transparency, and continuous enhancement. It employs six core processes: product backlog, sprint planning, sprint backlog, daily scrum, sprint review, and sprint retrospective. These steps comprise a sequence of activities aimed at efficient software development. The product backlog is a list of prioritized features awaiting implementation. Sprint planning involves selecting items from the backlog for the upcoming sprint and outlining associated tasks. This leads to the creation of the sprint backlog, specifying commitments for the sprint.

The daily scrum is a standing meeting where the team discusses progress and daily plans. The sprint review showcases accomplishments at the sprint's end. The sprint retrospective encourages introspection to identify process improvements. This framework embodies teamwork and continuous evolution in software development. [8] [9] [10 ]


*Figure 2:Software Development Life Cycle*

**1.Requirement gathering**

This is the first phase of this process. The main goal of this process is understanding the expectations of the end-users and stakeholders of the system. We hope to survey to get a strong idea about the user expectations and their problems. A survey or questionnaire can be used rather than questioning every user. After this process requirements will be added to the software requirements specification document.

**2.Feasibility study (Planning)**

- **Economic feasibility**

The financial viability of a project, known as economic feasibility, stands as a pivotal factor in its accomplishment. This assessment gauges whether the project is financially sustainable. By scrutinizing the project's development expenses and potential gains, the economic feasibility report serves as a guide. Absence of a sound economic feasibility plan increases the odds of project failure. Hence, it becomes paramount that the proposed system is not only cost-efficient but also optimally effective, ensuring its triumphant execution. [11]

- **Scheduled feasibility.**

Crucial aspect to contemplate during project initiation is the feasibility of its schedule. Evaluating the viability of the project's timeline becomes imperative, as any deviations or failure to meet deadlines can wield substantial influence over the project's overall triumph. Hence, ensuring that the envisaged system accomplishes each task within the stipulated timeframe becomes of paramount importance, safeguarding the project's adherence to its designated schedule.[11]

- **Technical feasibility**

In the process of system development, technical feasibility planning holds significant importance. This phase encompasses the assessment of essential competencies and proficiencies needed for the creation of mobile and web applications. It also involves the capability to comprehend intricate software architectures and engage in productive communication with stakeholders to gather vital information. Devoid of meticulous technical feasibility planning, the realization of the proposed system's development and execution becomes improbable. Hence, possessing the requisite technical acumen and effective communication skills stands as a prerequisite for advancing the system's development.[11]

## 3.Design (system and software design documents)

After the planning phase, system and software design documents are created which contributes to the overall system diagram.

### Use case diagram

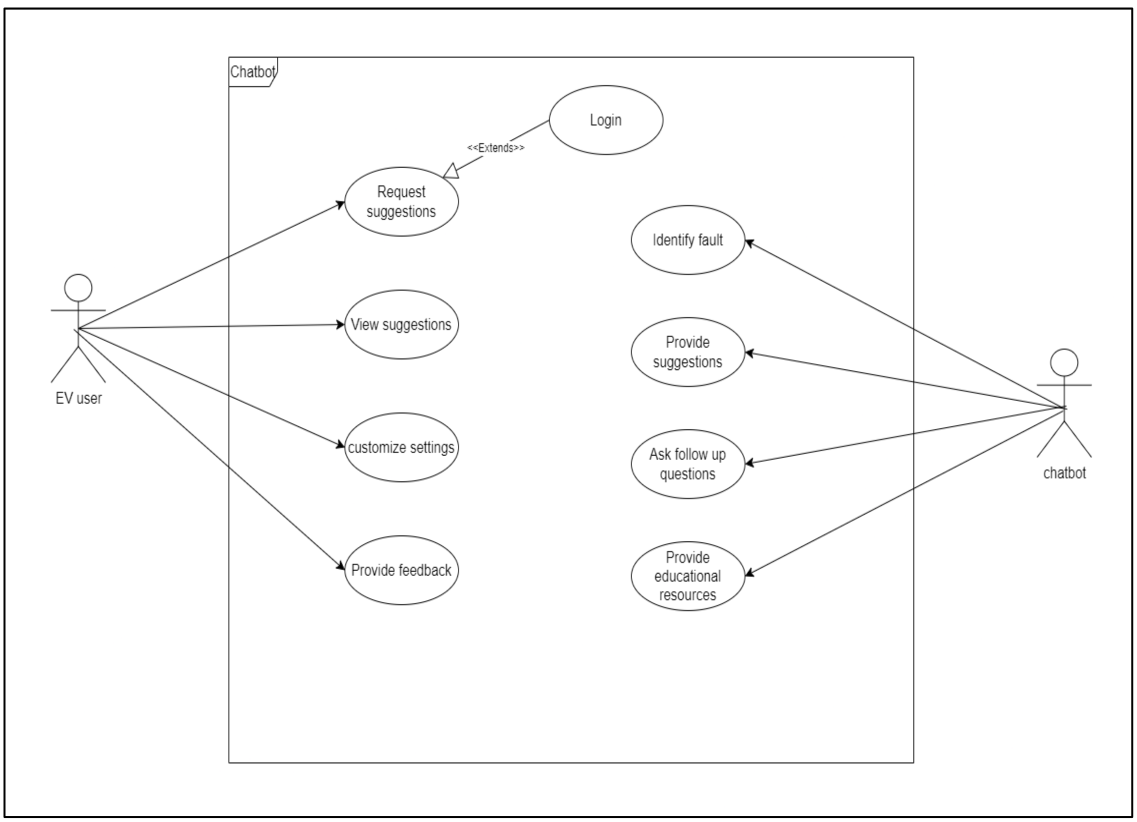


*Figure 3:Use Case Diagram*

- Login: The EV driver logs in to the chatbot system using their username and password.
- Input fault: The driver inputs EV fault in natural language.
- Classify fault: The chatbot uses machine learning algorithms to classify the fault input by the driver.
- Provide suggestions: The chatbot provides suggestions based on the user's input and the classified fault.
- Ask Follow-up Questions: The chatbot asks follow-up questions from the driver to gather additional information and provide more accurate suggestions.
- Provide Educational Resources: The chatbot provides educational resources or links to reputable sources for more information on specific fault.
- Provide Feedback: The driver provides feedback on the accuracy and usefulness of the system.
- Customize Settings: The driver customizes their preferences and settings, such as preferred language and preferred educational resources.

- **Sequence Diagram**

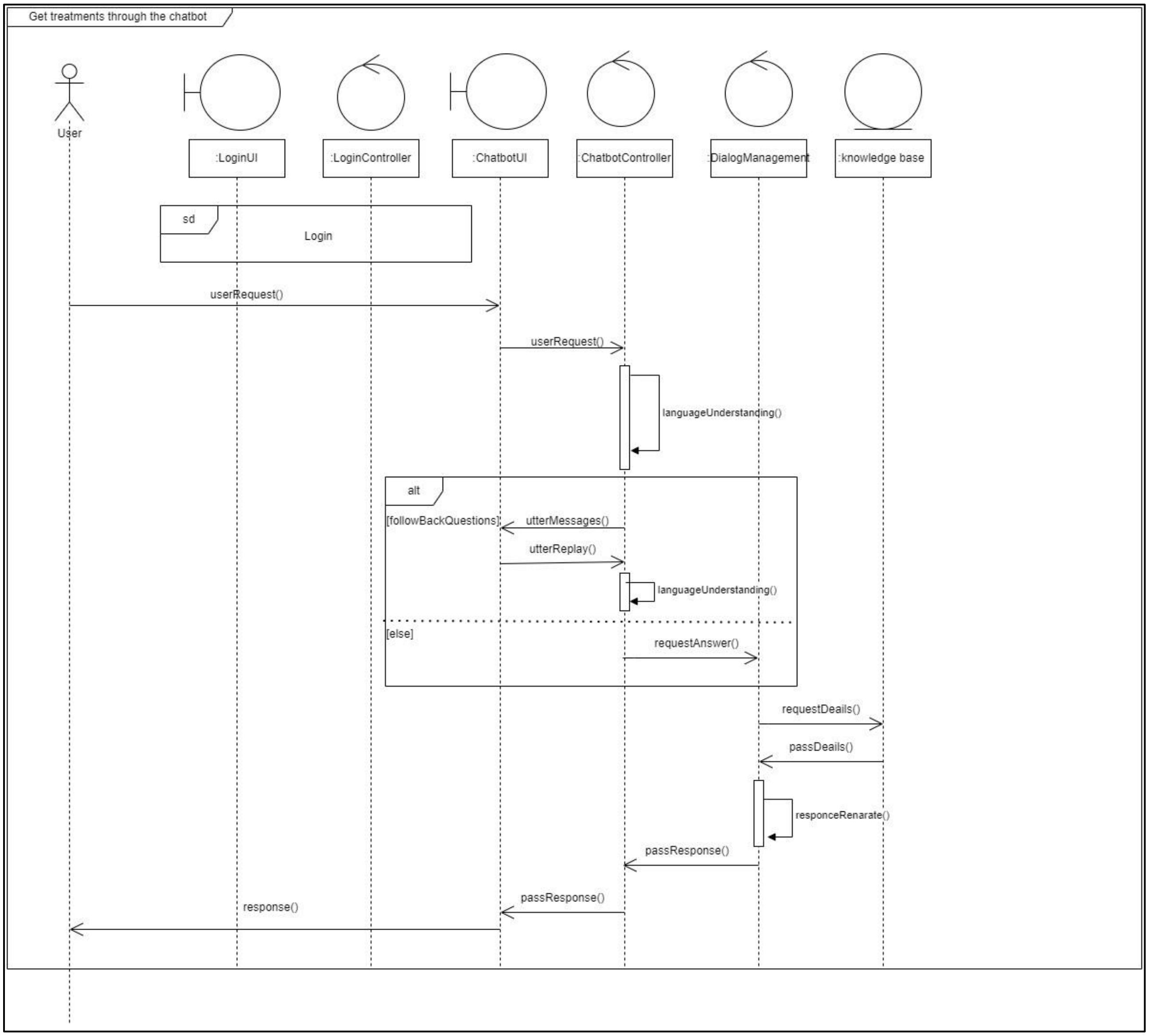


*Figure 4:Sequence Diagram*

## 4.Implementation (Development)

Creating the functionalities listed below to meet user needs aims to deliver a definitive solution characterized by utmost precision and dependability.

• Creating a knowledge base of fault characteristics related to each EV fault.

• Pre-processing and cleaning the data to prepare it for AI modeling.

• Training an AI model on the database to identify patterns and relationships between fault characteristics and recommendations.

• Evaluating the performance of the AI model on a validation set.

• Fine-tuning the model to improve its accuracy.

• Implementing the AI model in a mobile application.

• Verifying the accuracy and validity of the suggestions made by the software application.

• A conversational AI chatbot that allows users to text and receive solutions and recommendations for EV fault.

• The knowledge base will be updated and improved.

**5.Testing (Track and Monitor)**

In the life cycle of software development, the testing phase occupies a pivotal position as it guarantees the software's caliber and efficiency. This stage encompasses a comprehensive assessment of the software, targeting the identification of system gaps, unmet requisites, errors, and glitches necessitating resolution. The core aim of this testing phase revolves around heightening the software's overall quality and validating its alignment with its intended purpose. Within this phase, a range of testing processes is executed, each tailored to achieve distinct objectives. [12]

Unit testing involves scrutinizing individual modules or components to ensure their seamless functionality. Component testing amalgamates different constituents to assess the software's overall function. Integration testing delves into the interplay among diverse software elements, unearthing potential issues tied to their amalgamation. System testing zooms out to evaluate the complete software system, ensuring it adheres to designated specifications and performs as anticipated. User acceptance testing delves into the software's user-friendliness, validating its alignment with user requisites and anticipations. [13] [14]

Through this array of testing processes, the software undergoes thorough evaluation, exposing any shortcomings that could influence its efficacy, user experience, or function. By rectifying these anomalies, the software's quality undergoes enhancement, and its operational reliability gains affirmation.

3.1.2. Commercialization

**Future scope**

For the future scope of the application will be extended to give the solutions for hybrid vehicles and Internal combustion engine old vehicles. Improve user experience more and more.

**Target Audience**

- EV drivers
- EV owners
- EV manufacturers
- EV mechanics
- EV spare part shops

**Market Space**

- No need for advanced knowledge in technology.
- No age limitation for users.
- No need for prior knowledge about electric vehicles.

4.PROJECT REQUIREMENTS

**4.1 Functional requirements**

- EV user can ask questions based on their EV fault.
- Chatbot should be able to receive and understand questions related to fault from driver.
- Chatbot should be able to identify the fault based on the fault characteristics provided by the driver.
- Chatbot should be able to provide suggestions and recommendations for the identified fault.
- Chatbot should be able to provide information about fault type and reason for the fault.
- Chatbot should be able to provide links to credible sources of information about the fault.
- Chatbot should be able to maintain a record of vehicle faults and provide follow-up advice as necessary.
- Chatbot should be able to recognize emergency situations and provide appropriate advice, such as calling emergency services.
- Chatbot should be able to provide a user-friendly interface for user to interact with.
- Chatbot should be available 24/7 to provide support.
- Chatbot should be able to handle multiple conversations simultaneously to avoid delays or downtime.
- User should be able to provide feedback.

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### 4.2 Non-functional requirements

- Accessibility: The chatbot should be accessible to every driver with photo upload.
- Performance: The chatbot should respond to driver questions in a timely manner and be able to handle multiple user sessions simultaneously without causing significant delays or errors.
- Reliability: The chatbot should be available 24/7 with a high level of uptime and minimize system failures, errors, or crashes.
- Scalability: The chatbot should be designed to handle a large number of concurrent users and be easily scalable as the user base grows.
- Security: The chatbot should ensure the confidentiality of user information by using encryption and secure communication protocols and implementing access controls and authentication mechanisms.
- Usability: The chatbot should be user-friendly and easy to navigate for drivers of all ages (above 18) and backgrounds, with clear instructions and a simple interface.
- Compatibility: The chatbot should be compatible with a wide range of devices and operating systems, to ensure accessibility for as many EV users as possible.
- Maintainability: The chatbot should be designed with a clear and modular architecture that enables easy maintenance and upgrades to the system.
- Performance metrics: The chatbot should be regularly monitored for performance metrics such as response time, uptime, and user satisfaction, with appropriate actions taken to address any issues that arise.

### 4.3 System requirements

- Software development platform: The system would require a software development platform for developing and testing the chatbot software. This may include programming languages, frameworks, libraries, and development tools.
- Natural language processing (NLP) tools: The chatbot system would require NLP tools and libraries to analyze driver questions and identify relevant fault and fault characteristics.
- Machine learning models: The chatbot system may require machine learning models to improve its accuracy and efficiency over time.
- Server infrastructure: The chatbot system would require server infrastructure to run the necessary software and host the database of EV information and fault. The server infrastructure should have adequate processing power, storage, and network bandwidth to handle the expected workload.
- Database management system: The system would require a database management system (DBMS) to store and manage data.

- Communication channels: The chatbot system would require communication channels, such as web chat or messaging platforms, to enable EV users to interact with the chatbot.
- Security measures: The system would need to implement appropriate security measures, such as encryption, authentication, and access controls, to protect user's information and ensure data privacy.

### 4.4 User requirements

- Accuracy: Users would expect the chatbot to accurately diagnose their EV faults and provide appropriate suggestions.
- Accessibility: The chatbot should be easily accessible and available 24/7 to answer questions and provide support.
- Ease of Use: The chatbot should be user-friendly and easy to navigate, even for those who may not be tech-savvy.
- Personalization: Users may appreciate personalized recommendations based on their EV fault.
- Feedback and Improvement: Users may appreciate the ability to provide feedback to the chatbot and suggest improvements to enhance their experience.
- Reliability: The chatbot should be reliable and able to handle a variety of faults and provide accurate information consistently.

## 5.Gantt Chart

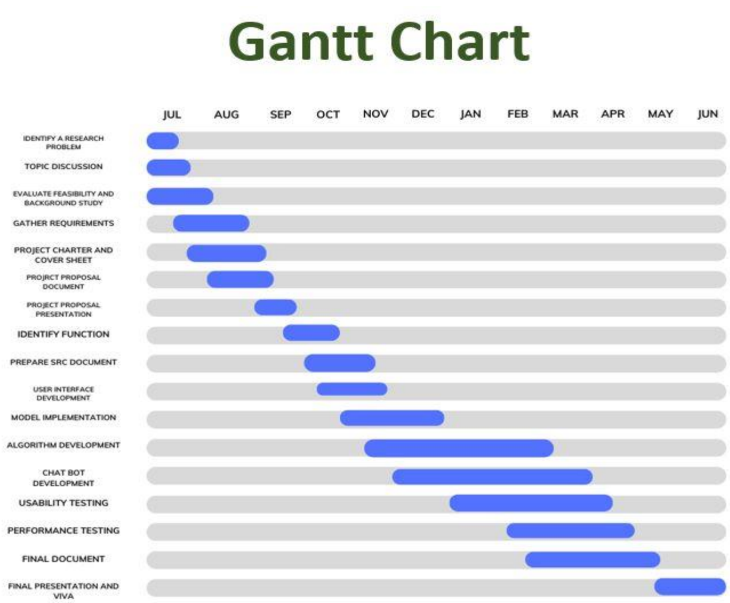


*Figure 5:Gantt Chart*

## Work Breakdown Structure (WBS)

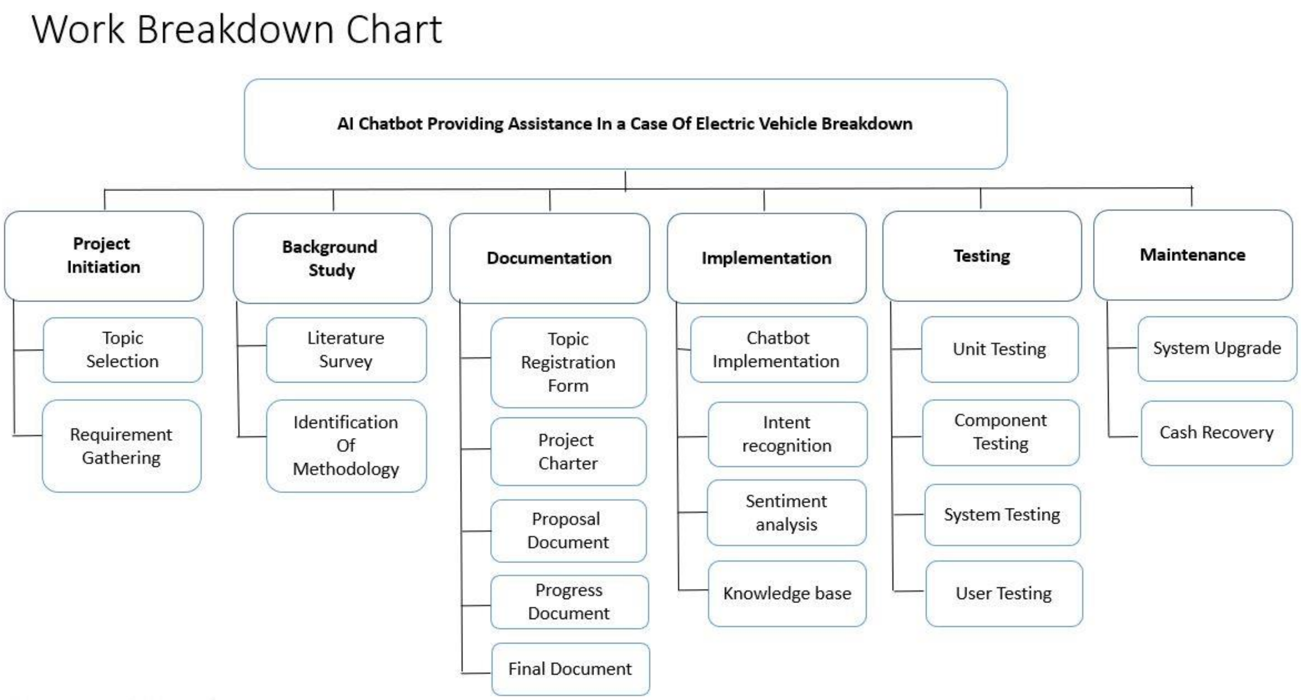


*Figure 6:Work Breakdown Chart*

6.BUDGET AND BUDGET JUSTIFICATION

| EXPENSES | |
|---|---|
| Requirements | Cost ($) |
| Travelling cost for data collection (per day) | 4.56 |
| Cost of Deployment (per month) | 25 |
| Cost of hosting in Play Store (one-time registration fee) | 30 |
| Google NLP (per 1,000 units of sentiment analysis) | 100 |
| Storages | 0.11 |
| Total Cost | 159.67 |

*Table 2:Budget plan*

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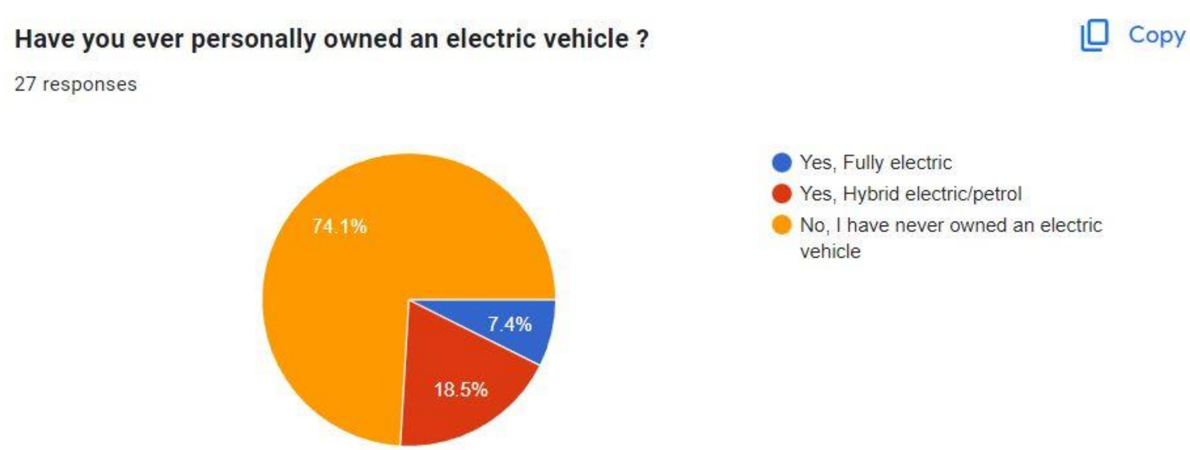
# 8.APPENDICES

**Appendix A -SURVEY LINK**

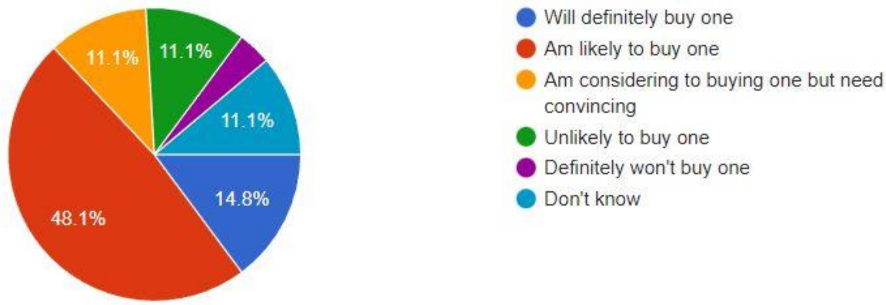
https://forms.gle/JQcxdPGPtDa6SiBY9



**How likely are you to consider buy an electric vehicle in the next 5 years ?**

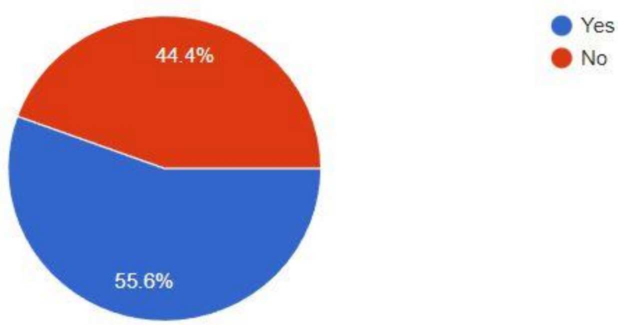
Cop

27 responses



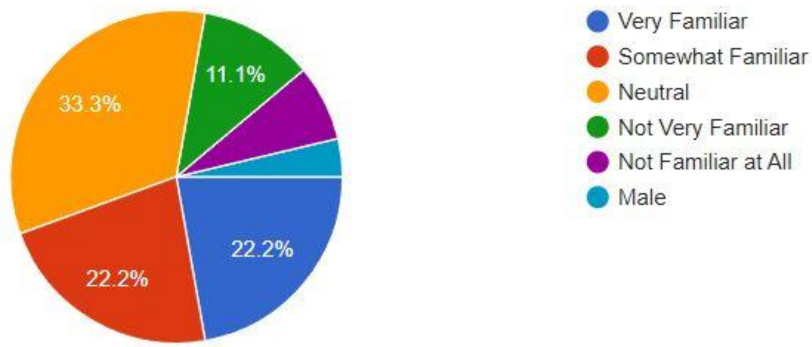

**Have you ever driven an electric vehicle ?**

27 responses



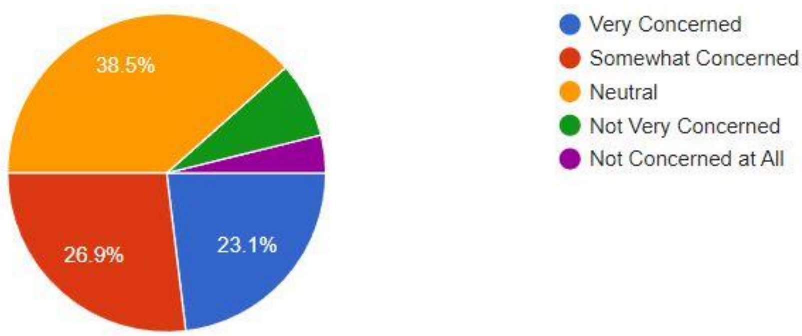
**How familiar are you with the concept of Artificial Intelligence (AI)?**

27 responses



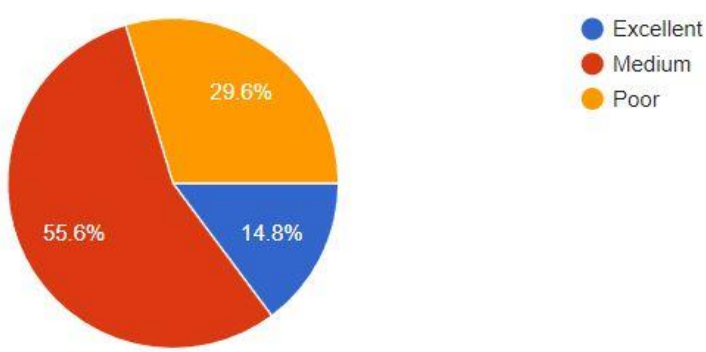

**How concerned are you about AI replacing certain human tasks and jobs?**

26 responses



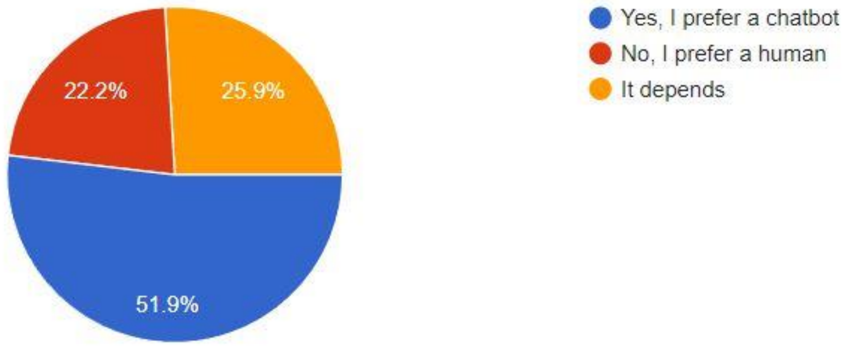

**How is your knowledge about electric vehicles ?**

27 responses



Would you like to use a conversational chatbot to diagnose the fault and get recommendations if your electric vehicle suddenly breakdown ?

27 responses




**Are you aware of any software or applications that currently offer AI-based assistance for electric vehicle fault detection and assistance?**

26 responses