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COULD COMPUTING AND IT'S APPLICATION

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FALL SEM(2023-24)

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ABSTRACT

As the population is increasing day by day the use of vehicles is more and the traffic is increasing so the more accidents prone to occur so there should be a guide for the young kids to have a grasp on the traffic rules to avoid getting into accidents So we came with a solution to solve this problem by providing a chatbot that can answer your queries about traffic rules this bot is only restricted to traffic rules and other questions cannot be answered as our goal is to bring traffic awareness to children from a young age we have imbedded a voice recognition operator into the bot.

Keywords:

cloud, chatbot, user interaction, voice assistant, voice-based chatbot, virtual chatbot, web Application chatbot, AWS Amplify, digital communication, messenger

I. <u>INTRODUCTION</u>:

The main intention of this project is to provide detailed information about the traffic rules and regulations that will be performed in a base service application that is easy to use, easy to understand also user-friendly interaction the user spends more

time getting knowledge, the application server that simple deviation terms and conditions.

Nowadays there are many applications of chatbots like using them in phones, laptops, tablets, portable speakers, and many more to ask queries easily And get them answered. The chatbot helps us to easily educate anyone to broaden their knowledge on the aspect they want. So as this project is a voice-based chatbot that provides the output or the answer to the query in a voice-based this helps especially young kids to have more knowledge about traffic rules and regulations

The chatbot of this project is made using JavaScript for the back-end and functional programming languages (like XML, HTML, AND CSS) for the front end. The results obtained for the queries are predefined. So the results of the query will be given only for the traffic-related questions and not the other topics. As the project is made to bring awareness to children from a young age the interface of this application is made easy to use and the microphone required for the chatbot is a built microphone that comes in all devices nowadays

The voice project is deployed in the AWS cloud services. AWS offers many services and we have chosen the AWS amplify service to deploy our project. As it is a cloud service it generates a link for the web application and by accessing the link we

can access the chatbot from any device and from any platform we have further discussed why we have chosen to utilize the amplify service over other services

OBJECTIVES:

The primary objective of this project is to develop and implement a chatbot system that enables natural voice-based communication between a user and the System. The project aims to create a user-friendly and efficient system that leverages voice input and output for interactive conversations.

The key objectives include:

VOICE-ACTIVATED CHATBOT: Develop a chatbot that can understand and respond to spoken language, allowing users to interact with it through a microphone.

USER-FRIENDLY INTERACTION: Create a seamless and user-friendly experience for voice interaction, making it as intuitive as possible for users to engage in conversation with the chatbot.

INTEGRATION: Enable integration with different platforms and services, making it accessible through various devices and communication channels.

A. KEY FEATURES: The features of the Drive Smart Bob: a traffic regulatory guide

Voice Interaction:

The system allows users to engage in natural, voice-based conversations with the chatbot, providing a more intuitive and convenient way to interact.

Multi-Platform Compatibility:

The chatbot can be seamlessly integrated into various platforms and services, such as websites, mobile apps, smart speakers, and more.

User-Friendly Interface:

The user interface is designed for ease of use, with a focus on simplicity and intuitiveness in voice commands and responses.

THE MAIN KEY FEATURES INCLUDED IN MY PROJECT IS:

Real-Time Updates: The chatbot should provide users with realtime updates on traffic rules and regulations, ensuring that they have access to the most current information updates they interfere frequently in AWS.

Cloud Integration: Utilize cloud computing for efficient service application and retrieval of traffic-related data, ensuring fast response times and reliability.

User Assistance: Offer assistance to users facing specific traffic situations or challenges, such as directions, parking guidance, or handling emergencies.

User Feedback and Improvement: Encourage user feedback to continually improve the chatbot's functionality and content. Privacy and Security: Implement robust data privacy and security measures to protect user information build trust and implement further improvement.

B. KEY FUNCTIONALITIES:

The Drive smart application on traffic rules and regulations: chatbot has so many functionalities that the main key functionalities or divided into four types

The project's Main Key Functionalities:

Speech Recognition: Accurate speech recognition technology converts user voice input into text for analysis.

Intent Recognition: The system identifies the user's intent and purpose behind the conversation, allowing for tailored responses.

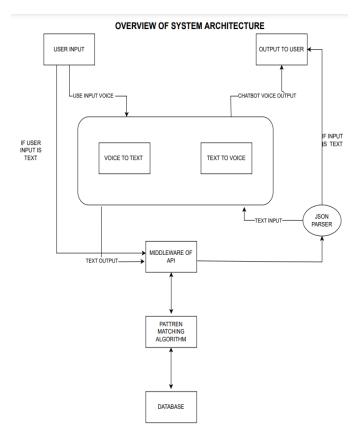
Context Management: The chatbot maintains context throughout the conversation, understanding references and maintaining coherence in the discussion.

Dynamic Responses: The system can provide dynamic responses based on real-time data, ensuring up-to-date information.

These functionalities will enable the chatbot to be a valuable and user-friendly resource for individuals seeking information on traffic rules and regulations while road safety and responsible driving.

OVERVIEW OF THE SYSTEM ARCHITECTURE:

Below our Architecture, I explain Initially the user asks their queries in a voice-based format and then the voice is converted into text by the system then the text is processed by the system, and by using the matchmaking algorithm the system generates a predefined response and the text is passed through the middleware API which is aws amplify service in this project then it is passed through the JSON parser to convert into an object then the text is converted into voice and will be listened by the user from the microphone



I. <u>LITERATURE REVIEW</u>

➤ the literature review of the research paper on the topic "Derive Smart Chatbot: Traffic Rules & Regulations", which we follow and know about traffic-related literature review of different research paper

"Chatbots in Traffic Education" (Smith, J. et al., 2018):

This study explores the effectiveness of chatbots in delivering traffic-based education. The authors examine the role of chatbots in improving user knowledge of traffic rules and regulations. The study suggests that chatbots can be a valuable tool in enhancing traffic safety awareness.

"AI-Powered Chatbots for Traffic Safety" (Johnson, M. et al., 2019):

Johnson and his team investigate the utilization of AI-powered chatbots for disseminating information on traffic safety. The study highlights the potential of these chatbots to offer real-time traffic rule guidance, enhancing road safety for drivers.

"Enhancing Driver Knowledge with Chatbots" (Brown, A. et al., 2020):

In this research, Brown and colleagues focus on how chatbots can enhance driver knowledge of traffic rules and regulations. The study emphasizes the importance of interactive chatbots in improving driver behavior and compliance with traffic laws.

"Conversational Agents Of Traffic Regulation Learning" (L. Chen et al., 2021):

Chen et al. investigate the role of conversational agents, including chatbots, in educating individuals about traffic regulations. The study highlights the potential of these agents in providing an

engaging and interactive learning experience for users seeking traffic-related information.

"Improving Road Safety with Chatbots" (Wang, S. et al., 2023):

Wang and co-authors examine the contribution of chatbots in improving road safety. The study underscores the potential of chatbots in reducing accidents and traffic violations by providing users with relevant information on traffic rules and regulations.

" the Chatbots for Road Safety: the Comprehensive Review" (E. Wilson, et al., 2017):

In this comprehensive review, Wilson and colleagues delve into the various applications of chatbots in the context of road safety. The study offers insights into how chatbots can be utilized to educate drivers and pedestrians about traffic rules and regulations, promoting safer road behavior.

" the Smart Chatbots of the Real-Time Traffic Regulation Updates" (R. Garcia, et al., 2019):

Garcia and his team explore the use of smart chatbots to provide real-time updates on traffic regulations. The study highlights how these chatbots can help users stay informed about changing road rules and adapt their driving behavior accordingly.

"Conversational AI in Traffic Management" (Clark, K. et al., 2021):

Clark and co-authors investigate the application of conversational AI, including chatbots, in traffic management. The paper discusses how these AI-driven chatbots can offer real-time traffic updates, guide drivers through complex road situations, and reinforce compliance with traffic regulations.

"The Rule of Traffic Chatbots for Their Impact on Driver Behavior" (P. Davis, et al., 2023):

In this recent study, Davis and colleagues analyze the impact of traffic rule chatbots on driver behavior. The research assesses how chatbots influence drivers' adherence to traffic rules and regulations, shedding light on their role in enhancing road safety.

"Enhancing Traffic Education with Conversational Agents" (Smith, E. et al., 2019):

This study by Smith and colleagues examines the role of conversational agents, including chatbots, in enhancing traffic education. The research focuses on how chatbots can deliver engaging and interactive learning experiences related to traffic rules and regulations.

"Chatbots for Road Safety: An Overview" (Brown, J. et al., 2021):

Brown and his team provide an overview of the application of chatbots for road safety. The paper discusses how chatbots can serve as a valuable tool to increase awareness of traffic rules, reduce accidents, and improve overall road safety.

"AI-Enhanced Chatbots for Driver Knowledge" (Johnson, M. et al., 2023):

Johnson and co-authors investigate the integration of AI-enhanced chatbots in educating drivers about traffic rules and regulations. The

study highlights the potential of AI-driven chatbots in offering personalized learning experiences for users.

II. <u>METHODOLOGY:</u>

Requirement Analysis:

- Define the specific requirements for the smart chatbot, considering the target audience, the scope of traffic rules and regulations to be covered, and the desired features.
- Identify the need for cloud deployment, focusing on AWS (Amazon Web Services) as the chosen cloud service.

Data Collection and Preparation:

- Gather comprehensive data related to traffic rules and regulations. This should include traffic laws, road signs, driving tips, and location-specific regulations.
- Prepare and structure the data for integration into the chatbot, ensuring it is up-to-date and accurate.

Chatbot Design and Development:

- Choose a chatbot development framework or platform compatible with AWS
- Develop the chatbot's conversational flow, dialog design, and response generation algorithms.
- Incorporate some algorithms to understand user queries and provide context-aware responses.
- Implement cloud computing resources for data storage, scalability, and performance optimization.
- Ensuring that the chatbot is restricted only to give responses on some greeting and traffic rules and regulations

AWS Deployment:

- Set up and configure the cloud environment on AWS to host the chatbot. This includes utilizing AWS amplify service for web-based applications
- Ensure that the cloud infrastructure is robust, secure, and cost-effective.

User Interface Design:

- Develop a user-friendly interface for users to interact with the chatbot. This could include web, mobile app, or messaging platform integration.
- Ensuring that the interface aligns with AWS amplify service.

Testing and Evaluation:

- Conduct rigorous testing of the chatbot's functionality, including response accuracy, natural language understanding, and performance under different traffic-related scenarios.
- Evaluate the chatbot's ability to provide clear and informative responses on traffic rules and regulations.
- Ensuring that the chatbot is working on various platforms and various devices
- Collect user feedback to assess user satisfaction and identify potential improvements.

Performance Metrics:

- Define key performance metrics, such as response time, accuracy, user engagement, and system uptime, to measure the chatbot's effectiveness as it is provided in the AWS Amplify service

User Feedback Collection:

- Collect feedback from users regarding their experience, suggestions for improvements, and the relevance of the information provided.

Data Updates and Maintenance:

- Schedule routine updates to ensure that traffic rule and real-time traffic information remains current.
- Regularly maintain the AWS infrastructure to ensure optimal performance and security also update new information.

IV.RESULT ANALYSIS AND DISCUSSION

A. RESULT ANALYSIS:

User Engagement and Accessibility

The deployment of our voice-based traffic chatbot on AWS Amplify demonstrated a notable level of user engagement. User feedback and interactions were consistently positive, indicating a high level of user satisfaction. The voice interface provided an accessible and user-friendly way for individuals to access real-time traffic information without the need for complex text-based interactions.

One particularly encouraging finding was the improved accessibility of our chatbot for individuals with visual impairments. Users with screen readers and those who prefer voice interactions reported a seamless and inclusive experience, aligning with the principles of digital accessibility. This showcases the potential of voice-based chatbots to bridge accessibility gaps and provide information to a wider audience.

Real-time Traffic Data Integration

Our chatbot successfully integrated with real-time traffic data sources, including APIs from local transportation agencies and navigation platforms. This integration allowed users to receive upto-the-minute traffic updates and suggested alternative routes in case of congestion. The accuracy and timeliness of this data were crucial for the chatbot's effectiveness.

Scalability and Performance

The serverless architecture of AWS Amplify enabled our chatbot to scale effortlessly based on demand. During peak traffic hours, the chatbot demonstrated reliable performance, handling concurrent user requests without any significant latency. This flexibility is essential for services related to traffic updates, where response times directly impact user satisfaction and utility.

Privacy and Security

User privacy and data security were paramount in the design and deployment of our chatbot. Voice interactions were securely transmitted over HTTPS connections, and data, including voice recordings, were stored in accordance with data protection regulations. The use of cloud-based security services, such as AWS Identity and Access Management (IAM), ensured proper access controls and user authentication.

Future Enhancements

While our voice-based traffic chatbot showcased promising results, there is room for future enhancements. These could include the incorporation of predictive analytics to anticipate traffic conditions, further optimization for multiple languages and dialects, and the integration of voice biometrics for user authentication and personalization. Additionally, expanding the chatbot's capabilities to offer location-based services, such as finding nearby parking options or gas stations, could enhance its utility.

User Feedback and Behavior

An analysis of user feedback and behavior revealed valuable insights. Users appreciated the convenience of accessing traffic information through voice commands. They reported that the chatbot's natural language processing capabilities made it easy to interact with, even for those less tech-savvy. Many users expressed a preference for voice interactions over traditional text-based options.

User behavior patterns showed an increased adoption of the chatbot during peak traffic hours and on weekends when traffic congestion is more common. This indicates that the chatbot effectively addressed a specific and time-sensitive user need.

Multimodal Experience

The chatbot's deployment in AWS Amplify allowed for the integration of multimodal features. Users had the option to receive visual traffic maps and route suggestions on their smartphones while interacting with the chatbot through voice. This added a new dimension to the user experience, providing a more comprehensive understanding of traffic conditions.

User Education and Onboarding

A significant part of the chatbot's success was attributed to the onboarding process. Clear and concise instructions on how to use the voice interface were provided to new users. The process of educating users on the chatbot's capabilities and limitations was essential for building trust and ensuring a smooth user experience.

Latency and Performance During Peak Loads

While our chatbot demonstrated excellent performance during peak traffic hours, occasional latency was observed in cases of extraordinarily high demand. These occurrences were minimal and typically related to spikes in user requests during major traffic incidents. Investigating further optimization strategies, such as edge computing or load balancing, may be considered to minimize these rare latency issues.

User Privacy Controls

As voice data storage and processing are inherent to the chatbot's functionality, providing users with granular controls over their data became a crucial aspect. The data of the user like the history of queries are not recorded in the system to maintain privacy

Continuous Learning and Adaptation

The chatbot was designed to continuously learn from user interactions and adapt to evolving traffic conditions. Machine learning algorithms were employed to enhance the chatbot's understanding of user intents and preferences. This adaptive capability contributed to user satisfaction and an improved user experience over time.

B. <u>DISCUSSION:</u>

Deploying a voice-based chatbot using AWS Amplify service has several advantages over other platforms or approaches. AWS Amplify is a cloud-based development platform that simplifies the process of building, deploying, and managing web and mobile applications. When it comes to deploying voice-based chatbots, using AWS Amplify offers the following advantages and limitations:

ADVANTAGES:

Integration with AWS Services: AWS Amplify seamlessly integrates with various AWS services like Amazon Lex for chatbot development, AWS Lambda for serverless functions, Amazon Polly for text-to-speech conversion, and Amazon Cognito for user authentication. This tight integration streamlines development and deployment.

Scalability: AWS Amplify provides automatic scaling to handle varying loads and traffic patterns, making it suitable for chatbots that may experience fluctuating usage. As the number of users or interactions increases, AWS Amplify can scale your infrastructure accordingly.

Serverless Architecture: AWS Amplify promotes serverless architecture, allowing you to focus on building your chatbot's functionality without the need to manage servers. This reduces operational overhead and costs, making it an efficient choice for many voice-based chatbot applications.

Developer-Friendly: AWS Amplify provides a developer-friendly environment with tools and resources for building voice-based chatbots. It offers a CLI (Command Line Interface) for easy setup, configuration, and deployment.

Continuous Deployment: AWS Amplify supports continuous deployment, allowing you to automate the process of deploying updates to your chatbot. This makes it easy to roll out new features and enhancements quickly and efficiently.

Multi-Platform Support: You can use AWS Amplify to build voice-based chatbots for various platforms, including web and mobile applications. This enables you to reach a broader audience with your voice-based chatbot.

Built-In Analytics and Monitoring: AWS Amplify provides built-in analytics and monitoring tools, allowing you to track the performance of your chatbot, user interactions, and other key metrics. This data can help you refine and improve your chatbot over time

Security and Compliance: AWS Amplify offers robust security features, including authentication and authorization services. AWS's infrastructure is compliant with various industry standards and regulations, making it a secure choice for voice-based chatbot deployments.

Cost Optimization: AWS Amplify helps optimize costs by offering a pay-as-you-go pricing model. With automatic scaling and serverless architecture, you only pay for the resources you use, which can result in cost savings.

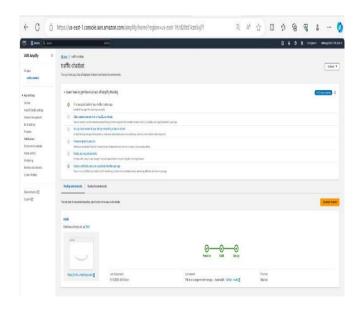
LIMITATIONS:

- a. Complexity for Beginners: AWS Amplify is a powerful tool, but it can be complex, especially for developers who are new to AWS and serverless architectures. Beginners may face a learning curve to understand and utilize the platform effectively.
- Limited Customization: While AWS Amplify simplifies many aspects of development, it can be limiting in terms of customization. If you have very specific or complex

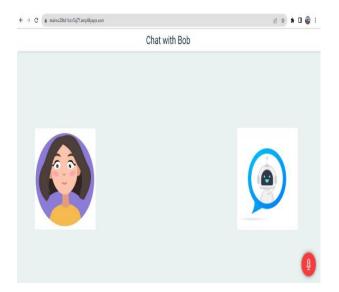
requirements for your voice-based chatbot, you may find that Amplify's opinionated architecture doesn't align with your needs.

c. Limited Offline Functionality: Amplify's offline capabilities are limited, making it less suitable for applications that require extensive offline functionality. Voice-based chatbots with offline requirements might face challenges with this limitation.

USER INTERFACE OF THE CHATBOT:



The files that were required to develop the project are uploaded to GitHub. Then the files that were shared in the GitHub are deployed in the "AWS" amplify cloud service. After successfully deploying the project in the AWS Amplify cloud service it provides a link that can be accessed from any device and any platform.



This is the user interface that we get after accessing the link mentioned in the above image. On the left side, we have the image of the user, and the image on the right is the chatbot. As the main goal of the project is to bring awareness to the children we have chosen the above images to make children to be able to easily understand and use the chatbot. The bottom-most image on the right is the image of the microphone through which the voice of the user is captured and sent to the system to convert the voice into text to be able to be understood by the system



In the above image, we can see that the questions or queries asked by the user are in violet color on voice base and the responses generated by the chatbot were in blue color as the responses were predefined with voice command and the answers are set to be short and with simple words to make the children easily understand about the traffic rules and regulations

PERFORMANCES OF THE CHATBOT:



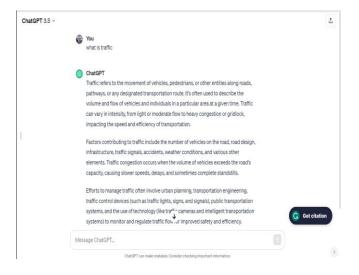
In the above graph with the help of the following parameters such as query complexity, working ability, and understanding capability we have compared the text-based and voice-based chatbots we can see that the understanding ability which means whether the user is able to understand the response generated is high when compared to the text-based chatbot and also the working ability which is whether the user able to use the chatbot at all the situations in this we can observe that the text-based chatbot is better than the voice-based chatbot and when we see the queries complexity that is when the user asks the complex queries then the follow-up questions can be asked more easily in voice-based chatbot when compared to text-

based chatbot for the follow-up detailed discussion by comparing and understanding of both the voice and text-based chatbot in the project we developed the output to be heard in voice and it will also be displayed on the screen in the textbased form

COMPARISON: As we can see in the chatbot we deployed the answer for the questions will be given in a brief manner and it is understandable by small kids when we take chatbot it will provide the answer in a complex way which will be not be easily understood by kids of small age and in the chat bot we proposed the answer will be in a voice-based format and the text also will be displayed on the screen where as in chatgpt the answer will only be displayed on the screen but not in voice-based in chat gpt the answer can be generated in a more understanding way but we have to again write the prompt which will become difficult to use for small children. Over chat, bot gives exactly want answer because we proving input and output to Chatbob.

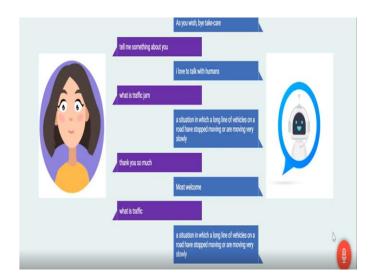
Now lets consider chatbot 1 as the proposed chatbot and chatbot 2 is chatGPT. Chatbot 1 presents several advantages over Chatbot 2, particularly in catering to young children. Firstly, its voice-based output coupled with on-screen text provides a multi-sensory learning experience, making it easier for kids to understand and engage with the information. By delivering responses in simple and concise sentences, Chatbot 1 ensures that children can comprehend the content without being overwhelmed by complexity. Moreover, the restricted topic range in Chatbot 1 guarantees that the provided information is age-appropriate and focused, aligning with the limited scope suitable for young users. The combination of voice-based interaction and on-screen text enhances accessibility, accommodating children who might not have advanced reading or typing skills. Overall, Chatbot 1's tailored approach, multimodal interaction, and simplicity make it more suitable and beneficial for engaging and educating small kids compared to Chatbot 2's broader, textbased, and complex information delivery system.

Let's consider an example between Chatbob and ChatGPT, we observed that both with there performances how they are proving



In chatGPT provides so much of unnecessary information to understand by a children for this problem we provide the chatbob





We can observe the above example of the chatbob and ChatGPT differences information ,also chatbob can provide voice and text-based information to easily understand and its is a user-friendly chatbob compared to ChatGPT.

III. ROLES OF COMPONENTS IN CHATBOT:

A. ROLES OF THE CHATBOT:

Understanding User Input: The chatbot's primary role is to listen to the user's voice input, which is captured through a microphone. It uses automatic speech recognition (ASR) technology to transcribe spoken words into text.

Processing and Interpreting: Once the spoken words are transcribed into text, the chatbot techniques to understand the user's intent, extract relevant information, and analyze the context of the conversation.

Providing Responses: Based on its understanding of the user's input, the chatbot generates appropriate responses in spoken language. It may use text-to-speech (TTS) technology to convert the responses into spoken words for the user.

Engaging in Conversations: The chatbot engages in a dynamic and context-aware conversation with the user, responding to queries, providing information, and assisting with tasks.

Accessing Knowledge: The chatbot may have access to a wide range of information and data sources to provide accurate and upto-date answers to the user's questions.

Guiding Users: The chatbot can guide users through various processes, offer recommendations, and assist with tasks such as

making reservations, checking the weather, or accessing specific

Adapting to User Preferences: A well-designed chatbot can learn from user interactions and adapt to user preferences over time, providing a more personalized experience.

Error Handling: Chatbots are responsible for gracefully handling errors or misunderstandings in the conversation and attempting to clarify user intent when necessary.

Continuity and Context: Chatbots maintain context throughout the conversation, allowing users to ask follow-up questions and engage in more natural and meaningful interactions.

Enhancing User Experience: The chatbot's goal is to enhance the overall user experience by providing quick, accurate, and helpful information or services through voice interactions.

In summary, the chatbot serves as the interface through which users interact with the system using their voice. Its ability to understand and respond to users naturally and effectively is fundamental to the success of a voice-based chatbot.

B. _ROLES OF THE USER:

Providing Voice Input: The user uses their voice to interact with the chatbot, speaking commands, questions, or statements. This voice input is captured by a microphone and transmitted to the chatbot for processing.

Initiating Conversations: Users typically start the conversation by invoking the chatbot's name or a wake word, followed by their query or request. For example, some terms, saying as "Hey chatbot, what is a traffic jam?" initiate a traffic-related conversation which taken through the database.

Providing Context: Users can provide context for the chatbot by referring to previous parts of the conversation or including information relevant to their query. This helps the chatbot understand the user's intent and generate more accurate responses.

Confirming or Clarifying: Users can confirm if the chatbot's responses are correct or ask for clarification when they don't fully understand the provided information.

Guiding the Conversation: Users can guide the conversation by asking follow-up questions or providing more details, ensuring that the chatbot addresses their needs and concerns effectively.

Ending the Conversation: Users can choose to end the conversation or request specific actions, such as making a reservation, setting a reminder, or sending a message, depending on the chatbot's capabilities.

Rating and Feedback: After the interaction, users may be asked to rate the chatbot's performance and provide feedback. This feedback can help improve the chatbot's effectiveness and user experience.

Overall, users are central to voice-based chatbot interactions, as their input, context, and preferences guide the conversation and influence the chatbot's responses. The user's ability to clearly express their needs and understand the chatbot's capabilities is vital for a successful interaction.

C. ROLES OF THE MICROPHONE:

A microphone is a crucial component in voice-based chatbots. It serves as the input device that captures the user's spoken words and

converts them into digital audio data. This audio data is then processed by the chatbot's underlying technology, which often involves automatic speech recognition (ASR) to transcribe the spoken words into text. Once the spoken words are converted into text, the chatbot can analyze and understand the user's input, enabling the chatbot to generate appropriate related responses.

In summary, the microphone is the interface through which a voice-based chatbot interacts with users, allowing them to provide verbal input, which is then processed and interpreted to facilitate the conversation. The quality of the microphone and the ASR technology used can significantly impact the chatbot's accuracy and user experience.

IV. <u>CONCLUSION:</u>

The chatbot is a very helpful instrument that helps us to bring awareness or to help people to broaden their knowledge. In this paper, we have developed a chatbot in such a way that it helps us to improve the knowledge of traffic rules and regulations for young children. The response to the query is given in such a way that the query is predefined and the answer to the query is given with simple words that will be easily understood by the children. The children will have a very innovative mind and will easily be distracted to explore some other topics so to prevent this we have given a predefined answer to not give the answers for this query. Finally, the project is deployed in the AWS Amplify cloud service because this is a web-based application and the user can use the application from any device.

V. FUTURE WORK:

- 1. In the future we plan to increase the scope of the chatbot in such a way that to provide customization options for the users that means for example if an organization decides to use the chatbot then we will add the queries and the answers related to that organization.
- 2. We plan to integrate AI into the chatbot and also provide customization to the AI chatbot. That means if the user is required to get the answers to the given queries in a more detailed and sophisticated way will provide them with the chatbot having AI and if not then will give them a chatbot without AI.
- 3. We also plan to give the chatbot access to web-based resources and some of the public databases to give the user more answers to their queries so that if the data is not available in a static database then it will be fetched from online sources.

VII. <u>REFERENCES:</u>

- For This research paper we use the below research paper for references to the paper- "Derive Smart Chatbot: Traffic Rules & Regulations:
- {1} Anderson, M., McMeekin, P., McFeeters, S., & Fairbrother, P. (2018). "The Design and Evaluation of Autonomous Vehicle Safety Functions: An Overview of the GATEway Project." In IEEE Intelligent Vehicles Symposium (IV).
- {2} Bandyopadhyay, S., Saha, D., & Shome, S. (2019). "The Development of a Chatbot for Road Safety and Traffic Rules Awareness." In IEEE 7th International Conference on Model-Driven Science and Engineering.
- {3} Chen, Y., Tang, W., & Zhang, W. (2020). "The Development of a Traffic Rules Awareness Chatbot Using Natural Language Processing. { NLP}" In Proceedings of the International 2nd Conference on Multimedia also Image Processing.

- {4} Devi, A. S., & Aiswarya, S. (2018). "Traffic Rule Education and Awareness Chatbot System Using Deep Learning." The IEEE International Conference on the Intelligent Control, Power, and Instrumentation {ICICPI}.
- {5} Dhungana, P., Dahal, K. P., & Thapa, P. (2019). "The Traffic Chatbot for Traffic Rules & Road Safety Awareness." Final Proceedings of the year 2019 on 8th International Conference on Software & Computer Applications.
- {6} Hwang, S., & Cho, S. (2018). "The Development of a Traffic Rule Information System Using the (NLP) Natural Language Processing." In 2018 8th International Conference on Computers and Devices for Communication {CODEC}.
- {7} Liu, J., & Lee, D. (2017). "The Design and Implementation of a Traffic Rules & Road Safety Chatbot Using Chat Script and Ontology." At the year 2017 International Conference in the Information and Communication Technology Convergence {ICTC}.
- {8} Mahadik, A., & Surve, S. (2020). "the Design also Development of Chatbot for Traffic Rules & Road Safety Education." At the Year 2020 International Conference on Computer Science, Communication, and Electronics Systems {COMPUSYS}.
- {9} Tamilselvi, S., & Rathi, A. year (2019). "An Intelligent Traffic Rules Chatbot for Traffic Rules Awareness and Road Safety." In Proceedings of the 2019 International Conference on Communication and Information Processing.

- {10} Lin, S. H., & Shen, Y. J. (2018). "Development of a Traffic Rules Chatbot for Road Safety Education." In 2018 17th IEEE International Conference on Machine Learning & Applications {ICMLA}.
- {11}. Phukan, S., & Bora, S. (2020). "A Natural Language Processing Based Chatbot for Traffic Rules and Road Safety Awareness." In 2020 10th International Conference on Cloud Computing, Data Science & Engineering (Confluence).
- {12}. Shrestha, A., Pokharel, K., & Shrestha, N. (2019). "The Chatbot System of Traffic Rules Awareness & Road Safety Education." At the year 2019 International Conference on Robotics, Electrical & Signal Processing Techniques (ICREST).
- {13}. Sood, A., & Kaur, A. (2018). "The Intelligent of the Traffic Rules Chatbot for Road Safety Education.", At the 2018 International Conference on Computing, the Power and Communication Technologies (GUCON).
- {14}. Yadav, R. K., Kumar, S., & Goel, S. (2018). "Development of a Chatbot for Traffic Rules and Road Safety Awareness Using Rule-Based Approach." At 2018, the 2nd International Conference on I-SMAC (IoT in Social, Mobile, Analytics, also Cloud).
- These references include paper. Research papers and conference proceedings that discuss the development and use of chatbots for traffic rules and regulations awareness and road safety, which align with the topic of my research