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DYNAMIC CHATBOT FOR PARKING SERVICE

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Abstract

Chatbots, with current technologies that can interpret natural language and engage in human-like conversation, are becoming increasingly popular in the customer support sector. Because Chatbot can be used to provide a wide range of services, a conversational chatbot in the parking industry was created in this study using the Dialog flow bot framework. To name a few, the built chatbot handles sophisticated activities such as reallocating parking spaces, updating registration plates, and cancelling subscriptions. The main significance of this work is the seamless integration of the chatbot and the user's mobile application using custom business logic written in Java to perform dynamic operations. The results demonstrated the ability of a chatbot to handle complex realtime queries and take appropriate action without the need for human intervention. The chatbot was created using Dialog flow, a bot framework. Conversational flows were developed using both linear and non-linear dialogues. In contrast, one of the most important aspects of obtaining user information was accomplished through fulfilment. It does, however, have several drawbacks. To begin with, the created chatbot is the first of its kind, automating many customers service tasks with minimal human intervention. As a result, to fully leverage the chatbot's potential, it has yet to be deployed in a production environment.

I INTRODUCTION

Nowadays, to interact with clients, digital communication tools have become increasingly widespread, and a vital aspect of organizations. As a result, many businesses provide an online chat service interface that allows customers to communicate directly with customer support representatives. This form of chat-based service is a cost-effective solution and frequently the preferred mode of communication for individuals. Conversational agents (CA) or Chatbots are one service or technology that is extensively utilized to aid customer support professionals. Conversational agents, also known as chatbot, are a type of artificial intelligence-powered self-service technology that can understand human language and not

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only command, but also learn from human conversations, transforming into intelligent agents. They use technology such as natural language processing (NLP), natural language understanding (NLU), and natural language generation (NLG) to interact with humans. Chatbots are predicted to improve service quality and provider-customer interactions while saving money. CAs, according to studies, can reduce current global business expenses – $1.3 trillion connected with 265 billion customer service inquiries per year – by 30%, by reducing response times, freeing up people for other activities, and handling up to 80% of fundamental issues

By 2022, chatbots alone are expected to save businesses more than $8 billion in customer-supporting expenses, a considerable increase from the $20 million in savings forecast in 2017. As customer service is critical to an organization's ability to generate income and revenue, it is frequently a resource intensive department of an organisation, consuming millions of dollars per year to change the entire perception customers hold as staff spend significant amounts of time answering repetitive questions from a variety of customers via various communication mediums. As a result, chatbots are an excellent way to supplement customer service. The development of a powerful agent conversational agent is demonstrated in this paper by analyzing an organization's customer support services workflow, mapping various conversational journeys, and incorporating the flows using Dialogflow, a chatbot development framework with natural language processing and natural language understanding capabilities. This would entail integrating the chatbot into a mobile app and responding to client enquiries 24 hours a day, 7 days a week, while maximizing return on investment, quick onboarding, and capacity management.

II LITERATURE SURVEY

Examining satisfaction with the experience during a live chat service encounter-implications for website providers

This paper furthers our understanding of online customer support with regard to online live chat systems. Online live chat systems allow customers to seek service related information from an organisation via online-based synchronous media with a human service representative who provides answers through such media. With use of a web-based survey involving 302 respondents of real-life live chat service experiences with mobile phone network providers in the UK and through the use of structural equation modelling, the aim of this research is to understand the variables capable of influencing a customer's satisfaction with their experience during an online live chat service encounter. The results indicate the importance of service quality, information quality and system

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quality variables influencing satisfaction with the experience, while such influence is dependent on the purpose of use. Additionally, the results outline the role of emoticons, presence of service reps picture, automated 'canned' responses and the presence of response time estimations in moderating the influence of service quality, information quality and system quality variables on satisfaction with the experience.

"Measuring service encounter satisfaction with customer service chatbots using sentiment analysis,"

Chatbots are software-based systems designed to interact with humans using text-based natural language and have attracted considerable interest in online service encounters. In this context, service providers face the challenge of measuring chatbot service encounter satisfaction (CSES), as most approaches are limited to post-interaction surveys that are rarely answered and often biased. Asa result, service providers cannot react quickly to service failures and dissatisfied customers. To address this challenge, we investigate the application of automated sentiment analysis methods as a proxy to measure CSES. Therefore, we first compare different sentiment analysis methods. Second, we investigate the relationship between objectively computed sentiment scores of dialogs and subjectively measured CSES values. Third, we evaluate whether this relationship also exists for utterance sequences throughout the dialog. The paper contributes by proposing and applying an automatic and objective approach to use sentiment scores as a proxy to measure CSES.

"Artificial intelligence chatbots are new recruiters,"

The purpose of the paper is to assess the artificial intelligence chatbots influence on recruitment process. The authors explore how chatbots offered service delivery to attract and candidates engagement in the recruitment process. The aim of the study is to identify chatbots impact across the recruitment process. The study is completely based on secondary sources like conceptual papers, peer reviewed articles, websites are used to present the current paper. The paper found that artificial intelligence chatbots are very productive tools in recruitment process and it will be helpful in preparing recruitment strategy for the Industry. Additionally, it focuses more on to resolve complex issues in the process of recruitment. Through the amalgamation of artificial intelligence recruitment process is increasing attention among the researchers still there is opportunity to explore in the field. The paper provided future research avenues in the field of chatbots and recruiters.

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III EXISTING SYSTEM

Online Search: Use search engines to look for chatbot systems in the parking industry. Specify keywords related to your project, such as "parking chatbot," "parking service automation," or "parking management chatbot."

***Industry Reports*:** Check industry reports, white papers, and case studies related to parking services and chatbots. These documents often highlight successful implementations and existing systems.

***Vendor Websites*:** Explore websites of companies that specialize in providing solutions for parking management or chatbot development. They may showcase their products and case studies.

Conferences and Expos: Look into events, conferences, or expos related to parking management, artificial intelligence, or chatbot development. These events often feature demonstrations of existing systems.

***Professional Networks*:** Connect with professionals in the parking industry, AI, or chatbot development on LinkedIn or other professional networks. You can inquire about existing systems or seek recommendations.

***Ask Experts*:** If possible, reach out to experts in the field, such as researchers, practitioners, or consultants, and inquire about existing systems or recent developments.

Limitations

***Limited Understanding*:** Chatbots may struggle to fully understand complex or ambiguous user queries, especially in dynamic scenarios where users might use colloquial language or introduce new concepts.

***Dependency on Training Data*:** The effectiveness of chatbots heavily depends on the quality and quantity of training data. If the system hasn't been trained on a diverse set of scenarios, it may struggle to handle certain user requests.

Inability to Handle Unforeseen Situations: While chatbots can handle predefined scenarios well, they might struggle when faced with entirely new or unforeseen situations, as they lack the ability to reason and adapt like humans.

Lack of Emotional Intelligence: Chatbots may lack emotional intelligence and struggle to understand or respond appropriately to users' emotions or nuanced expressions.

IV PROBLEM STAEMENT

To address client inquiries about their parking services, the organization currently employs a traditional customer support framework and platform. The development chatbot, on the other hand, uses dialogue flow along with unique business logic in Java and addresses client inquiries when given a specific customer enquiry, the chatbot leverages by identifying the specific problem via intents and entities and

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performing dynamic actions such as validating the customer's account and performing the necessary actions such as reallocating parking spaces, cancelling subscriptions

V PROPOSED SYSTEM

To the identified limitations of existing systems in the realm of dynamic chatbots for parking services, our proposed system aims to overcome these challenges and enhance user experience, operational efficiency, and security. The core focus of our system lies in advancing natural language understanding capabilities to handle complex and context-rich queries, ensuring that the chatbot can interpret user inputs accurately, even in scenarios involving colloquial language or novel situations.

Additionally, our proposed system places a strong emphasis on continuous learning and adaptability, utilizing machine learning algorithms to refine and expand its knowledge base over time, ultimately improving its ability to handle unforeseen scenarios. Security measures will be a top priority, implementing robust encryption and authentication protocols to safeguard sensitive user information, such as license plates and personal details. Seamless integration with mobile applications will be achieved through optimized business logic, written in Java, ensuring a smooth and user-friendly interface. Furthermore, the proposed system will prioritize context retention across conversations, enabling a more coherent and personalized interaction. Regular updates and maintenance protocols will be implemented to address evolving user needs and technological advancements. Through these enhancements, our proposed system aims to deliver a dynamic chatbot solution for parking services that not only addresses existing limitations but also sets a benchmark for intelligent, secure, and user-centric conversational interfaces in the parking industry.

Advantages

Enhanced User Experience

VI IMPLEMENTATION

Natural Language Processing (NLP) Module:

This module is dedicated to advanced natural language understanding, allowing the chatbot to interpret and respond to user queries in a human-like manner. Leveraging NLP techniques, the system can extract meaning from diverse language inputs, facilitating effective communication with users.

Machine Learning and Adaptability Module:

The machine learning module is designed to continuously enhance the chatbot's capabilities by learning from user interactions and adapting to new scenarios. Through ongoing training, the system improves its accuracy in handling complex queries and evolves to meet changing user needs.

Security and Authentication Module:

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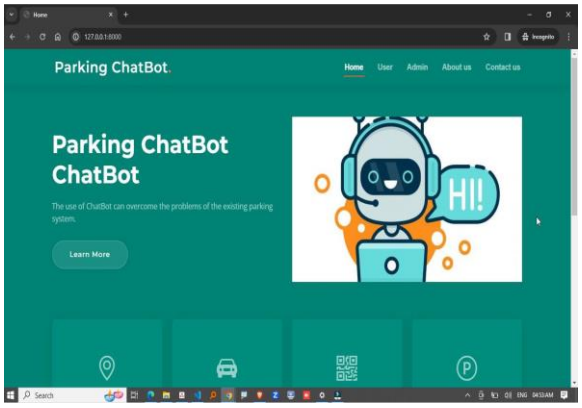
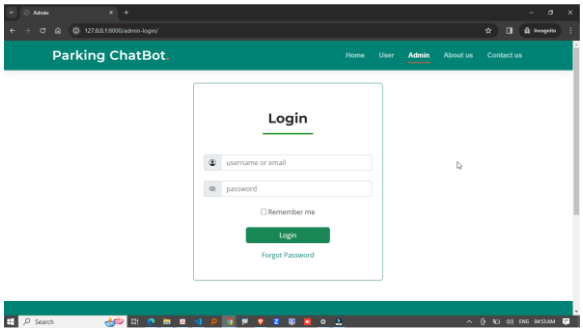
The security module is responsible for safeguarding user data and ensuring the integrity of sensitive information, such as license plates and personal details. It incorporates robust encryption and

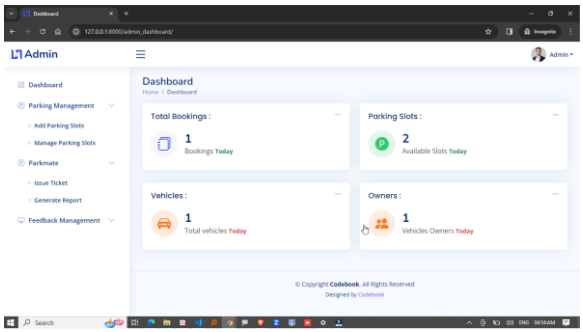
VIII RESULTS



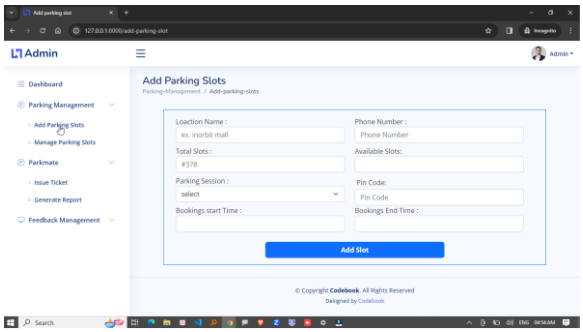
Home



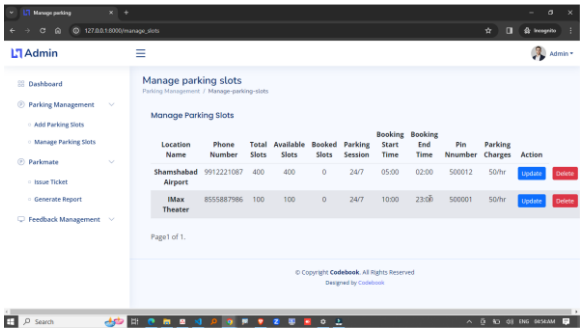
Admin



Admin Dashboard



Add parking slots



Manage Parking

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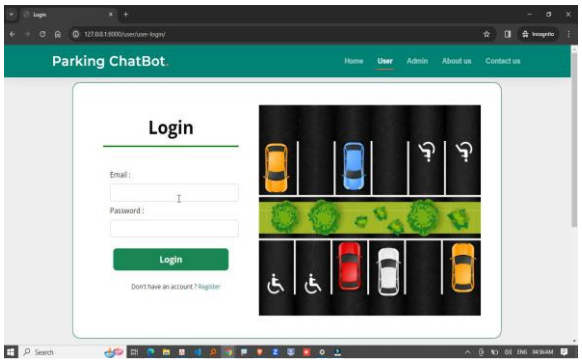
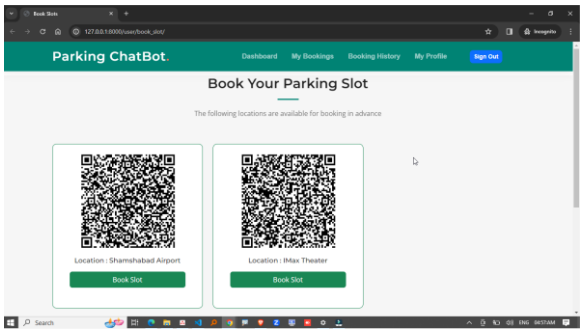
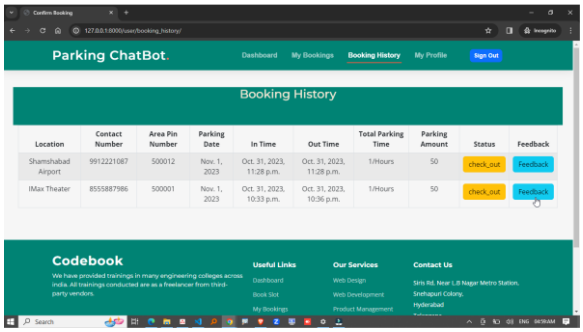


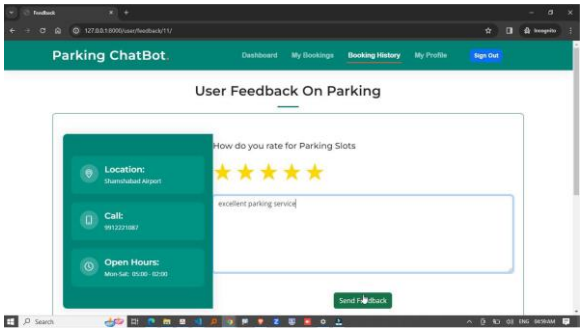
user dashboard



Booking Slots



Confirm Booking



Feedback

VIII CONCLUSION

The goal of this research study was to design and develop a robust chatbot that uses custom business logic written in Java to resolve customer inquiries dynamically without the need for human intervention. The first dataset included textual conversations between customer service and clients, while the second included audio call recordings. The primary dataset was pre-processed using a custom pipeline. The pre-processed dataset was used to identify common training phrases for client questions, for which the chatbot was trained using the document clustering technique KMeans in conjunction with PCA. The chatbot was created using Dialog flow, a bot framework. Conversational flows were developed using both linear and non-linear dialogues. In contrast, one of the most important aspects of obtaining user information was accomplished through fulfilment. It does, however, have several drawbacks. To begin with, the created chatbot is the first of its kind, automating many customers service tasks with minimal human intervention. As a result, to fully leverage the chatbot's potential, it has yet to be deployed in a production environment. Secondly, the developed chatbot lacks the ability to capture custom number plates as they are quite unique in way. The chatbot's confidence in intent detection is high, but its conversational flows need to be

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fine tuned to have more control over the dialogues between user and chatbot

REFERENCES

[1] B. Larivière et al., "'Service Encounter 2.0': An investigation into the roles of technology, employees and customers," J. Bus. Res., vol. 79, pp. 238–246, 2017.

[2] G. McLean and K. Osei-Frimpong, "Examining satisfaction with the experience during a live chat service encounter-implications for website providers," Comput. Human Behav., vol. 76, pp. 494– 508, 2017.

[3] J. Feine, S. Morana, and U. Gnewuch, "Measuring service encounter satisfaction with customer service chatbots using sentiment analysis," 2019.

[4] N. Nawaz and A. M. Gomes, "Artificial intelligence chatbots are new recruiters," IJACSA) Int. J. Adv. Comput. Sci. Appl., vol. 10, no. 9, 2019.

[5] B. Buck and J. Morrow, "AI, performance management and engagement: keeping your best their best," Strateg. HR Rev., 2018.

[6] M. Adam, M. Wessel, and A. Benlian, "AI-based chatbots in customer service and their effects on user compliance," Electron. Mark., pp. 1–19, 2020.

[7] U. Gnewuch, S. Morana, and A. Maedche, "Towards Designing Cooperative and Social Conversational Agents for Customer Service.," 2017.

[8] L. Cui, S. Huang, F. Wei, C. Tan, C. Duan, and M. Zhou, "Superagent: A customer service chatbot for e-commerce websites," in Proceedings of ACL 2017, System Demonstrations, 2017, pp. 97–102.

[9] Google, "Dialogflow ES Documentation," 2010, [Online]. Available: https://cloud.google.com/dialogflow/docs.

[10] J. Cahn, "CHATBOT: Architecture, design, & development," Univ. Pennsylvania Sch. Eng. Appl. Sci. Dep. Comput. Inf. Sci., 2017.

[11] H. Al-Zubaide and A. A. Issa, "Ontbot: Ontology based chatbot," in International Symposium on Innovations in Information and Communications Technology, 2011, pp. 7–12.

[12] J. Singh, M. H. Joesph, and K. B. A. Jabbar, "Rule-based chabot for student enquiries," in Journal of Physics: Conference Series, 2019, vol. 1228, no. 1, p. 12060.

ISSN 2347–3657

Volume 12, Issue 1, 2024

[13] N. Rosruen and T. Samanchuen, “Chatbot utilization for medical consultant system,” in 2018 3rd technology innovation management and engineering science international conference (TIMES-iCON), 2018, pp. 1–5.

[14] H. A. Santoso et al., “Dinus Intelligent Assistance (DINA) chatbot for university admission services,” in 2018 International Seminar on Application for Technology of Information and Communication, 2018, pp. 417–423.

[15] J. Purohit, A. Bagwe, R. Mehta, O. Mangaonkar, and E. George, “Natural Language Processing based Jaro-The Interviewing Chatbot,” in 2019 3rd International Conference on Computing Methodologies and Communication (ICCMC), 2019, pp. 134–136.