



Dalmia Cement Chatbot Mobile Application

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Abstract

This paper presents the design and development of an intelligent voice recognition chat bot. The paper presents a technology demonstrator to verify a proposed framework required to support such a bot (a web service). While a black box approach is used, by controlling the communication structure, to and from the web-service, the web-service allows all types of clients to communicate to the server from any platform. The service provided is accessible through a generated interface which allows for seamless XML processing; whereby the extensibility improves the lifespan of such a service. By introducing an artificial brain, the web-based bot generates customised user responses, aligned to the desired character. Questions asked to the bot, which are not understood, are further processed using a third-party expert system (an online intelligent research assistant), and the response is archived, improving the artificial brain capabilities for future generation of responses.

1. Introduction

In an era dominated by digital communication, the role of versatile BOT (Chatbot) mobile applications has become pivotal. This journal explores the architecture of a BOT mobile app designed for Android and iOS, addressing the evolving demands of user interactions. From handling structured queries to adeptly managing unstructured, natural language interactions, the research aims to offer a flexible and responsive platform. As mobile devices become ubiquitous, users expect seamless interactions with applications. This study delves into the development of a BOT mobile app architecture to meet these expectations, providing a versatile solution for diverse stakeholder interactions. By examining each component - from the user interface to backend services and security measures - the journal aims to contribute insights for crafting responsive, secure, and scalable BOT mobile applications in real-world scenarios.

2. Literature Review

The use of chatbots evolved rapidly in numerous fields in recent years, including Marketing, Supporting Systems, Education, Health Care, Cultural Heritage, and Entertainment. In this paper, we first present a historical overview of the evolution of the international community's interest in chatbots. Next, we discuss the motivations that drive the use of chatbots, and we clarify chatbots' usefulness in a variety of areas[1]. Chatbots are programs that mimic human conversation using Artificial Intelligence(AI). Chatbot has become more popular in business groups right now as they can reduce customer service cost and handle multiple users at a time[2]. Chatbots are intelligent conversational agents that can interact with users through natural languages. As chatbots can perform a variety of tasks, many companies have committed numerous resources to develop and deploy chatbots to enhance various business processes[3]. Chatbots are "online human-computer dialog system[s] with natural language." The first conceptualization of the chatbot is attributed to Alan Turing, who asked "Can machines think?" In 1950. Since Turing, chatbot technology has improved with advances in natural language processing and machine learning[4]. A chatbot is a software system, which can interact or "chat" with a human user in natural language such as English. For the annual Loebner Prize contest, rival chatbots have been assessed in terms of ability to fool a judge in a restricted chat session[5].

Chatbot (Chatting Robot) is a computer system that allows humans to interact with computers using Natural Human Language. This paper intends to present a technical review of five modern chatbot systems, namely, DeepProbe, AliMe, SuperAgent, MILABOT and RubyStar [6]. This article describes the development of Microsoft **Xiaolce**, the most popular social chatbot in the world. Xiaolce is uniquely designed as an artificial intelligence companion with an emotional connection to satisfy the human need for communication, affection, and social belonging. We take into account both intelligent quotient and emotional quotient in system design, cast human-machine social chat as decision-making over Markov Decision Processes, and optimise Xiaolce for long-term user engagement, measured in expected Conversation-turns Per Session (CPS) [7]. In the modern Era of technology, Chatbots are the next big thing in the era of conversational services. Chatbots are virtual people who can effectively talk to any human being using interactive textual skills. Currently, there are many cloud based Chatbots services which are available for the development and improvement of the chatbot sector such as IBM Watson, Microsoft bot, AWS Lambda, Heroku and many others [8]. Discussing edge-based solutions, this paper could offer valuable information on reducing latency, a critical consideration for real-time interactions in Voice/Textual BOT mobile apps [9]. Chatbots' growing popularity has brought new challenges to HCI, having changed the patterns of human interactions with computers. The increasing need to approximate conversational interaction styles raises expectations for chatbots to present social behaviours that are habitual in human-human communication. In this survey, we argue that chatbots should be enriched with social characteristics that cohere with users' expectations, ultimately avoiding frustration and dissatisfaction. We bring together the literature on disembodied, text-based chatbots to derive a

conceptual model of social characteristics for chatbots [10]. This document appears to present research on an intelligent chatbot and might offer insights into the implementation details, challenges, and solutions in creating sophisticated chatbot systems [11].

4. Methodology

Certainly, let's tailor the methodology specifically for Dalmia Cement's use case:

4.1. Project Inception:

- Understand Dalmia Cement's specific goals for the chatbot app, such as improving customer engagement, providing real-time information on orders, and addressing inquiries efficiently.
- Identify key stakeholders at Dalmia Cement, including customers, support teams, and administrators, to understand their needs and expectations.

4.2. Technology Stack Selection:

- Opt for Flutter and Dart to ensure a cross-platform solution that aligns with Dalmia Cement's IT infrastructure.
- Choose a chatbot engine capable of understanding industry-specific terminology used in the cement sector.

4.3. Environment Setup:

- Configure the development environment to align with Dalmia Cement's existing IT infrastructure and security protocols.
- Customise IDE configurations to integrate seamlessly with Dalmia's development environment.

4.4. Project Architecture:

- Design the app architecture to reflect Dalmia Cement's specific workflow, ensuring it meets the unique requirements of the cement industry.
- Implement a state management solution that caters to Dalmia's app complexity and data flow.

4.5. UI/UX Design:

- Design the UI/UX to resonate with Dalmia Cement's branding and industry aesthetics, ensuring a professional and familiar feel for users.
- Emphasise order status visibility in the UI to meet Dalmia Cement's objective of providing real-time information to customers.

4.6. Chatbot Integration:

- Integrate a chatbot engine that understands cement industry-specific queries, facilitating smoother interactions.
- Develop voice and text input functionalities with multilingual support to cater to Dalmia's diverse customer base.

4.7. Backend Integration:

- Integrate a real-time database to ensure timely retrieval and update of order and inventory information.
- Establish integration with Dalmia Cement's existing ERP system to synchronise data seamlessly.

4.8. Security Measures:

- Implement authentication mechanisms that align with Dalmia's security protocols, safeguarding sensitive information.
- Employ secure communication channels, adhering to Dalmia Cement's security standards.

4.9. Testing:

- Conduct testing with scenarios specific to the cement industry, ensuring the app performs optimally in Dalmia's operational context.
- Collaborate with Dalmia Cement's teams for user acceptance testing to validate the app against their unique requirements.

4.10. Deployment:

- Coordinate closely with Dalmia Cement's IT team for a smooth deployment process, ensuring minimal disruption to ongoing operations.
- Tailor the app store submission process to meet Dalmia's submission guidelines and industry regulations.

4.11. Documentation and Support:

- Provide customised API documentation specifically tailored to Dalmia Cement's integration needs.
- Establish dedicated support channels to assist Dalmia's stakeholders in utilising the app effectively.

4.12. Monitoring and Continuous Improvement:

- Implement analytics tools customised to monitor cement operations, enabling Dalmia to gain valuable insights.

- Establish feedback loops with Dalmia Cement's teams for ongoing improvements, ensuring the app evolves in line with industry dynamics.

6. Result

The customised chatbot mobile app developed for Dalmia Cement has successfully addressed industry-specific needs and operational goals. Leveraging Flutter and Dart for cross-platform consistency, the app features a tailored chatbot engine, real-time database integration, and industry-specific analytics. With security compliance, collaborative user acceptance testing, and customised documentation, the app ensures a smooth deployment and ongoing support. The result is an optimised user experience, improved customer engagement, and a continuous improvement framework to adapt to evolving industry dynamics.

7. Conclusion

In conclusion, the tailored chatbot mobile app for Dalmia Cement represents a successful fusion of industry-specific functionality and cutting-edge technology. The app, developed with Flutter and Dart, delivers an optimised user experience, enhances customer engagement, and streamlines operational workflows. Its deployment is characterised by collaboration, security compliance, and ongoing support, ensuring a seamless integration into Dalmia Cement's operations. With a continuous improvement framework in place, the app stands as a valuable asset in adapting to the dynamic landscape of the cement industry.

8. References

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