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Interactive Chatbot for Customer Service with Voice Recognition

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ABSTRACT

This study aimed to develop an Interactive Chatbot for Customer Service with Voice Recognition for St. Paul University Philippines students, employees, parents, visitors, and stakeholders. It aimed to provide real time answers to inquiries from the concerned participants. The researchers employed a qualitative approach using descriptive research design and systems development in collecting, analyzing the data and the design and development of the system. The researchers conclude that the chatbot is a real time mobile application for the university that provides frequently asked questions to all Paulinian users anytime and anywhere. Moreover, it will also provide opportunity to have access to the appointed Head of Marketing and Promotions during office hours.

Key words: Chatbot, Frequently Asked Questions, Real Time, Voice Recognition

1. INTRODUCTION

Customer service plays a vital part in an organization's capacity to produce customer trust, quality of products and service income and revenue. A lot of time is being rendered by a support staff in answering questions using telephone or messaging applications to make sure customers are satisfied with their business. Through this method, the staff assigned usually receive repetitive questions asked by most of the customers, which can be cost-effectively answered by machines and it is difficult to support 24/7 services especially for most nonglobal businesses. The use of technological innovations important to improve its services to sustain and increase customers trust and experience. At present, websites and social media are also utilized to disseminate information to clients with instant messaging features to answer queries within office hours. Computer has made everyone's life more comfortable and simpler. The most vital factor of technology these days is having the ability of cognitive technologies and providing automation to save time, effort, and resources. The quest of serving customers 24/7 with delight introduces the use of chatbot that enables to answer basic questions via business messenger. The use of chatbot is designed to respond in real time to common queries that customers have in mind.

Ranoliya, B. R., Raghuwanshi, N., & Singh, S. (2017) state that Chatbots are programs that mimic human conversation using Articial Intelligence (AI). It is designed to be the ultimate virtual assistant, entertainment purpose, helping one to complete tasks ranging from answering questions, etc. Chatbot has become more popular in business groups right now as they can reduce customer service cost and handles multiple users at a time. Pattern-based and general questions like welcome/ greetings and general questions will be responded using the tool to provide responses at any time that will serve user satisfaction.

Sethi, F. (2020), In his study titled FAQ (Frequently Asked Questions) ChatBot for Conversation defines that ChatBot is a software application used to conduct an on-line chat conversation via text or text-to-speech, instead of providing direct contact with a live human. However, a FAQ chatBot is a type of internet bot or software application that is beneficial for answering some of the most frequently asked questions your customers may have. FAQ bots help direct customers to the right website pages and provide answers easily any time of the day. Sandoval, Z. V. (2018) presents in his study titled "Design and Implementation of a Chatbot in Online Higher Education" that Chatbots in education are in the beginning stage of development and implementation to answer FAQs of the syllabus of an online course created and implemented.

According to Khin, N. N., & Soe, K. M. (2020), Chatbots are conversational systems that can do chat interactions with human automatically. It is developed to be virtual assistant, making entertainment for people, helping in answering the questions, getting driving directions, serving as human partner in smart homes, etc. Most of the chatbots utilize the algorithms of artificial intelligence (AI) to get the required responses. In their study, they provided the design of a University Chatbot that provides an efficient and accurate answer for any user questions about university information. It is the first University Chatbot for inquiring about school information in Myanmar Language based on Artificial Intelligence Markup Language and uses Pandorabots as the interpreter.

Cui, L., Huang, S., Wei, F., Tan, C., Duan, C., & Zhou, M. (2017, July), developed SuperAgent, a customer service chatbot for e-commerce websites. Compared to conventional customer service chatbots, SuperAgent takes advantage of large-scale, publicly available, and crowd-sourced customer data. In addition, SuperAgent leverages state-of-the-art NLP and machine learning techniques, including fact QA, FAQ search, opinion-oriented text QA, as well as chit-chat conversation modeling. Usability analysis shows that SuperAgent has improved the end-to-end user experience in terms of online shopping. It is more convenient for customer's information acquisition especially when a product page contains too much user-generated content.
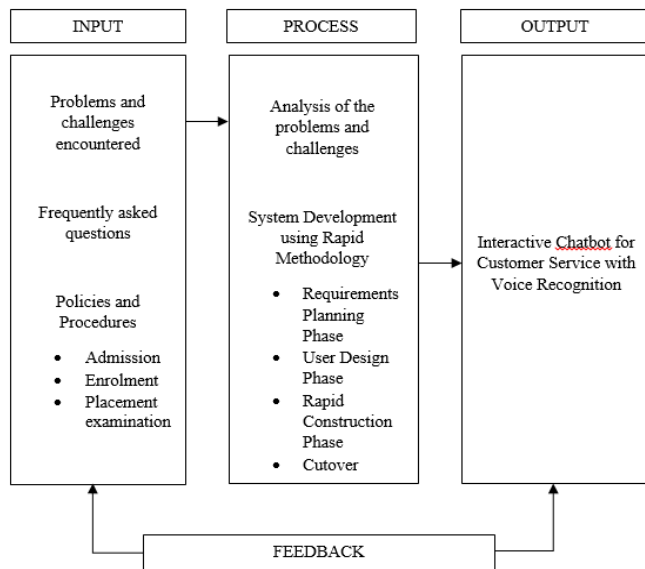
1.1 Conceptual Framework

Figure 1: Paradigm of the Study

The paradigm illustrates the input-process-output of the study. It shows the different inputs and processes to achieve the desired output of the study.

1.2 Statement of the Problem

This study aimed to develop a real time interactive chatbot for customer service with voice recognition for St. Paul University Philippines.

More specifically, the study sought answers to the following:
1. What are the problems and challenges encountered by the participants in obtaining real time answers to inquiries from the concerned?
2. What system can be developed to address the problems and issues encountered by the participants?
3. What enhancement can be done to improve the developed system?

2. METHODOLOGY

2.1 Research Design

This study employed a qualitative approach using descriptive research design and systems development in collecting, analyzing the data and the design and development of the system. The interview method was utilized to collect necessary information to determine the problems and issues encountered by the participants in the pre-admission.

2.2 Participants of the Study

The participants of the study were composed of 30 students from the different departments. The researcher made use of random sampling method.

2.3 Instrumentation

In gathering the necessary data, the study used interview, and substantiated with literature review.

Interview guide. The study used this technique to gather significant facts and information to be utilized in the study.

Interview was conducted to the college students from the different departments of St. Paul University Philippines to determine the problems and challenges encountered by the students to get real time answers to their inquiries.

2.4 Data Gathering Procedure

The researchers prepared a letter of permission from the administrators to gather related information needed for the development of the chatbot. After accepting the request, the researchers conducted personal interview using available online resources such as Google form, Google meet and MS Teams. Moreover, the researchers also gathered information using literature sources.

3. RESULTS AND DISCUSSION

A. Problems and Issues Encountered by the Participants.

The common problems encountered by the student-participants are the late responses to most of their inquiries such as:
- how to apply credentials/ certifications,
- how to enroll online,
- how to pay fees online,
- how to change password of the Student Information and Accounting System (SIAS) and access MS Teams account,
- how to follow up the status of their credentials/certification application,
- how to follow up status of grades for scholarship purposes,

The issues they encountered are the following:
- The late validation of online payments causes the delay of attending online classes for not being added in the MS Teams,
- Updating of officially enrolled students
- Communicating with concerned administrators,

faculty, and staff in this time of pandemic
- Processing time

B. *The Interactive Chatbot for Customer Service with Voice Recognition*

The developed system is designed to respond to common queries the customer has in mind in real time.

The app provides answers to repeated inquiries. It is accessible using smart phones. This customized chatbot for the university is a user assistant tool that is designed as a means of communication with human through their regular language.

The interactive Chatbot recognizes the user input that make use of the pattern in matching with the FAQ database and access information to provide a predefined response. The chatbot also has the features to link to the information provided at www.spup.edu.com. For further inquiries by the customer, the chatbot will direct the customer to the concerned unit head.
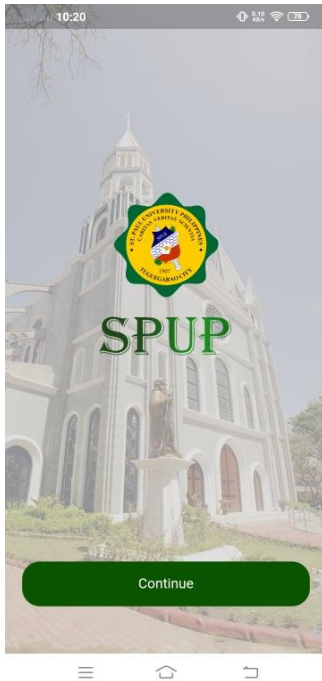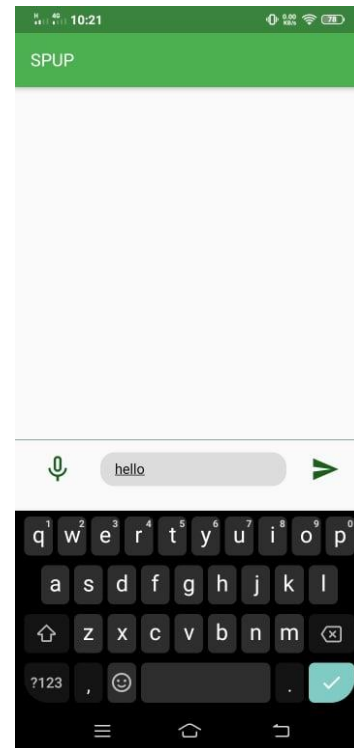

Figure 2: Chatbot Main Screen
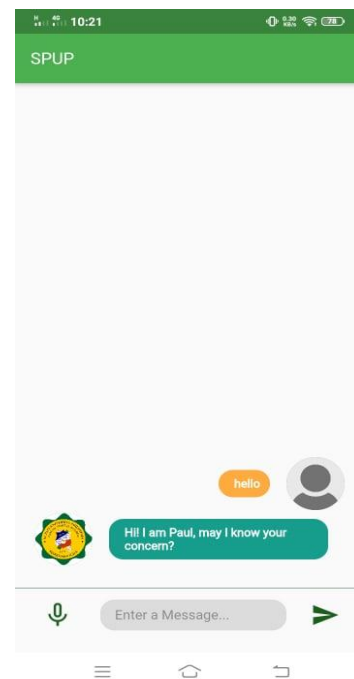

Figure 3: Queries Chatbot Screen

Figure 4: Chatbot Output Screen

C. *Enhancement of the System*

For future improvement of the work that would enhance the capability of the developed chatbot are the following:
- the app may be registered to Google play for easy installation of Paulinian users
- may consider running on IOS platform
- for future researchers, may consider integrating e-admission system

4. CONCLUSION

The chatbot is a real time mobile application for the university that provides frequently asked questions to all Paulinian users anytime and anywhere. Moreover, it will also provide opportunity to have access to the appointed Head of Marketing and Promotions during office hours.

5. RECOMMENDATION

Based on the findings and conclusions of the study, the following recommendations are presented:

1. The researchers may consider presenting the developed system to the administrators for its implementation.
2. The researchers may consider giving a training session on the use of the system for proper implementation.
3. The researchers may consider expansion of the developed application that will integrate IOS platform.
4. The researchers may also consider to integrate e-admission system

REFERENCES

1. Khin, N. N., & Soe, K. M. (2020, February). **University Chatbot using Artificial Intelligence Markup Language. In 2020 IEEE Conference on Computer Applications (ICCA)** (pp. 1-5). IEEE.
2. Sethi, F. (2020). FAQ (Frequently Asked Questions) **ChatBot for Conversation. Authorea Preprints.**
3. Sandoval, Z. V. (2018). **Design and Implementation of a Chatbot in Online Higher Education Settings**. Issues in Information Systems, 19(4).
4. Ranoliya, B. R., Raghuwanshi, N., & Singh, S. (2017, September). **Chatbot for University Related FAQs.** In 2017 International Conference on Advances in Computing, Communications and Informatics (ICACCI) (pp. 1525-1530). IEEE.
5. Cui, L., Huang, S., Wei, F., Tan, C., Duan, C., & Zhou, M. (2017, July). **Superagent: A Customer Service Chatbot for E-commerce Websites.** In Proceedings of ACL 2017, System Demonstrations (pp. 97-102).
6. Patel, Neelkumar & Parikh, Devangi & Patel, Darshan & Patel, Ronak. (2019). **AI and Web-Based Human-Like Interactive University Chatbot (UNIBOT)**. 148-150. 10.1109/ICECA.2019.8822176.