The Usability and Effectiveness of Artificial Intelligence Chatbot for University of Immaculate Conception Students' Queries

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1 Introduction

How can chatbots enhance efficiency and improve customer service? Nowadays, chatbots are top hit in different industries, primarily in the business and customer service sectors. It is efficient for both customers and clients since it is AI-powered and answers people's concerns immediately. Can a conversational chatbot's usability and effectiveness improve the University of Immaculate Conception's customer service?

A conversational chatbot is a computer program that interacts with users through either text or voice input. It uses Artificial Intelligence (AI) and Natural Language Processing (NLP) technologies to understand the user's questions and responses that resemble a human conversation. This technology is common and seen in many shapes and forms, such as smartphones, messaging apps, and other platforms that are accessible to most people.

The main advantage of using chatbots is that they offer quick and easy access to information without human interaction. Chatbots act like virtual assistants and help increase the online visibility and accessibility of products and services (Ranavare and Kamath, 2020)[8]. In education, chatbots aim to provide students with a more efficient way of resolving their questions, reducing the need for them to depend on administrative offices or instructors for answers (Singh Joseph and Abdul Jabbar, 2019)[11]. Conversational Chatbot saves students time and enhances their overall experience with the educational institution.

Meanwhile, the University of the Immaculate Conception offers its clients a comprehensive array of services through its administrative offices on campus. In addition, the University accommodates both on-campus and off-campus inquiries for these services;

- For on-site inquiries, the inquirer will have to go directly to the concerned office/s (e.g., for concerns that involve money or payment, the appropriate offices will be the Cashier or the Finance Office.
- For off-site inquiries, the inquirer will need to contact the concerned office/s through an email or telephone call.

Both modes of inquiry are available to all students or individuals. On-site offices are open for queries during specified office hours and days. To strengthen the stance of the study, the researchers conducted an on-site interview in the University of Immaculate Conception's Management Information Systems (MIS) Office, where most inquiries are directed. During the interview, specific issues, concerns, and problems regarding the many questions received by the office were uncovered.

The MIS office that aside from student inquiries about their UIC accounts and UIC portal, which can be addressed by submitting support tickets. They also received concerns regarding enrollment, financial payments, admission processes, and other urgent inquiries, which are not supported by the support ticket system and only received via telephone call or email; these kinds of queries can be answered immediately, but due to a high volume of concerns from different departments, it may take a while to receive a response. In such cases, they prioritize urgent situations and resolve them promptly while keeping other worries in their queue. Considering that most inquiries are sent via email, staff members may need to pay more attention to inquiry emails, as they can get mixed up with other school-related emails, or there may be a high volume of other inquiries to handle.

While efforts being made to provide quality services, addressing a large volume of inquiries can be challenging for the staff and inquirers, as it can consume significant time and effort. According to Narasimhaiah Gorla et. al (2010) [3]the delay in responses can affect the University's quality of service. Determining the critical aspects of IT quality is crucial in helping the head of the organization develop effective strategies for improving IT quality.

Currently, the University of Immaculate Conception needs the tools to respond efficiently to its client's inquiries. Developing a conversational chatbot that will answer common queries (admission process, enrollment, payment methods, etc.) will save time and effort; it will also lessen the number of unanswered questions, especially those kinds of queries mentioned, benefiting the staff by giving them opportunities to address and focus on more complex concerns as promptly as possible on the other side it will also help the inquirer for

they will no longer wait for hours or days for a response. The chatbot will also be able to classify urgent queries (money-related concerns, confidential documents, etc.) and notify the MIS. In this way, it will increase the University's productivity and efficiency in responding to the client's inquiries and improve customer service satisfaction. This study explores new methods of implementing machine learning in conversational chatbots for more precise responses and provides insight for future studies.

This research aims to offer a practical solution to the current issue by creating a conversational chatbot that promptly responds to text inputs in real-time, leading to a more efficient method of inquiry. The Chatbot will understand natural language inputs, provide relevant answers, and ensure a seamless and intuitive user experience. The main goal here is to develop a chatbot that will address the limitations of the current inquiry process and provide an efficient solution for the users.

2 Review of related literature

Furthermore, the following includes the ideas, finished thesis, generalization or conclusions, methodologies, and others. The studies included help in familiarizing relevant and similar information to the present study.

In a Global setting, E-Learning Management System is an online platform that aims to connect the University's instructors and students. It allows ease of sharing content in a learning environment. In early 2021, Kolej Yayasan Pahang implemented an eLMS using Moodle; its goal is to support communication processes between lecturers and students. Usually, the same questions are asked to the lecturer, whether in person or digitally, which causes the lecturer to give the same answers every time. The project's main objective is to develop an Artificial Intelligence Chatbot that will help students find any academic-related information without the need to ask their lecturer or spend more time browsing the internet. The eLMS was developed using the Rational Unified Process (RUP) approach. (Shilowaras and Jusoh, 2022, 70-74) [6]. The study of Singh et al. (2018)[12] developed Asia Pacific University Admin Bot, an AI Chatbot that was designed exclusively for the students of APU to provide a quicker way to resolve the student's queries instead of heavily depending on the Administrative offices. The Implemented AI Chatbot relies on the rule-based approach of pattern recognition of words and phrases; it is also reliant on a code-less authoring tool and a messaging platform instead of traditional programming and architecture structures.

Finding specific information on a University website can be tedious, especially if the website needs to be more varied and filled with redundant information. Thakkar et al. (2018)[5] developed an Artificial Intelligence Chatbot called Erasmus to address the issue. The AI Chatbot was designed to provide information on participating Universities to reduce search time for students and make the University website more friendly and informative. Erasmus was implemented using API.ai, a natural language understanding platform that makes designing and integrating conversational user interfaces into mobile apps or web applications. Erasmus was also implemented by setting up a Facebook Messenger app. It serves as the user interface where the users can ask their queries. The study of Sinha et al. (2019) [13] describes how documents can be converted into a conversational chatbot's knowledge to help users answer their queries. It aims to automate manual and administrative tasks by developing a system that can provide answers to a question provided by the users, an Educational Chatbot for College Students, and it is focused on a Web database to make it user-friendly, interactable, and scalable.

Bani et al. (2017)[1] proposed the implementation of A.L.I.C.E as a College Inquiry Chatbot that aims to help students solve problems and answer questions that arise during and after admission. A.L.I.C.E is a free natural-language Artificial Intelligence Chatbot. A Chatbot for College website was developed and designed to help visitors by answering common questions and providing information about the college courses, admission procedures, and events. It also aims to reduce the Administrative tasks of answering questions repeatedly. (Shivam et al., 2018, 74-77)[10]. Students face issues with regards to updates of revaluation examinations or results, about importance notice and events going on in the college. It also becomes a challenge to those students who live far away from the college to come for inquiry purposes. In addition, the reception gets chaotic during the admission since many students and parents visit the college to get their inquiry solved. To address this issue Huddar et al.(2020)[4] proposed the implementation of a College FAQ Chatbot called Dexter, it will be embedded to the college website and will be able to answer any college-related query.

Meanwhile, several studies use conversational chatbots in the Philippines to solve an existing problem. A leader of open and distance e-learning in the country, The University of the Philippines Open University (UPOU), explored the technology of Artificial Intelligence and developed the UPUO chatbot named Iska and IskOU; it provides an immediate and appropriate human-like response for their information support services wherein its users can ask in both English and Filipino languages, it can be accessed through the official UPUO Facebook page chat. It uses a keyword based matching system to detect the intent of the user and respond accordingly (Serrano et al., 2021)[9]. Since the start of the pandemic, face to face interaction and activities has been difficult, it affected multiple aspects of life including face-to-face counseling and it also conditioned the citizens to conduct everything online this fuel the De La Salle University (DLSU) Office of Counseling and Career Services (OCCS) to conduct a study about and developed a rule-based Artificial Intelligence Chatbot to determine if Chatbots can

help counselors in student habit assessments. The study contributes to further studies regarding rule-based AI Chatbot technology in counseling (Curugan, 2022)[2]. Cheerbot is a customer service AI Chatbot for Foam-Pom Pangasinan. Its architectural model is a retrieval-based model that allows the application to retrieve the most appropriate response from the predefined responses database to respond to the client's queries regarding Foam-Pom successfully (Marcelino et al., 2021)[7].

The studies above will be used to gather information for this study, to improve and explore newer technology for the usability and effectiveness of Artificial Intelligence Chatbot in service inquiry.

3 Methodology

3.1 Research Design

This study aims to determine the effectiveness and usability of implementing a conversational chatbot at the University of Immaculate Conception to solve the existing problem. The methods used in the study are Action Research Design, Qualitative and Quantitative Research approaches. The Action Research method is appropriate for this study for the following reasons; the study involves working collaboratively and closely with UIC administration offices to identify and solve problems. In this case, the high volume of inquiries is the problem, and the UIC Chatbot is the proposed solution. The research is conducted in a real-world setting, aiming to improve the University's performance in answering inquiries. The Qualitative Approach of this study is used to explore the participants' subjective experiences, opinions, and views. The researchers collected data through interviews or surveys. Meanwhile, the Quantitative Approach of this study is used to measure and analyze numerical data using statistical methods.

3.2 Research Approach

In this section, the researchers discussed the approach done to gather relevant information about the study including the evaluation of the solution made. The staffs of the University Administration offices, students, and potential students were identified as the research population. Meanwhile the participants in this study were UIC administrative staffs.

- may include in-depth reading -

- The researchers sought the permission of the Management Information Systems (MIS) Office to interview their staff/s in order to strengthen the researchers' understanding of the problem.
- The research was thoroughly explained to the participants, who were asked if they wanted to participate.
- The research questions were given to the chosen participants.

3.3 Conceptual Framework

Information will be entered by the user into the system's front end. After receiving the user's input from the front end, the back end will send the user's inquiry to a natural language understanding system for interpretation. The natural language understanding system will send the interpreted query back to the back-end after processing the input. The front-end will receive the interpreted query from the back-end and show the result after it has been given back to it.

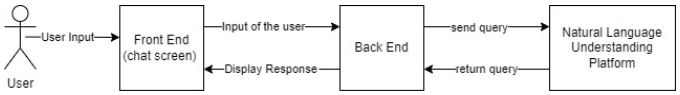

Figure 1. Lara's Conceptual Framework

3.4 Data Collection

The Qualitative method was used in collecting data. The researchers interviewed the University of Immaculate Conception Administrative Offices staff about the usability and effectiveness of the web-based UIC Chatbot. The researchers aim to learn whether the proposed chatbot helped to reduce the number of inquiries received mainly by the Management Information Systems (MIS) office and other University Administrative Offices. The participant was able to answer questions such as how they perceive the web-based UIC Chatbot from their perspective. The researchers also considered the suggestions they received to improve the study and the chatbot.

3.5 Data analysis

The researchers interviewed the MIS staff to determine the benefits of the UIC web-based chatbot and whether it could help lessen the number of inquiries received by the University's Administrative Offices. The researchers interviewed the participants and asked them the following questions:

1. What are the staff's experiences in handling and giving feedback/answering a high number of inquiries?
2. How would the staff describe the hassle of continuously answering many inquiries?
3. Do the staff receive repeated questions from different inquiries?
4. What are the commonly asked questions/inquiries that the staff received?
5. How long does it take to answer an inquiry?
6. What is the average number of inquiries the staff received from parents/students?
7. What are the benefits of the UIC web-based chatbot to UIC administrative office staff?

The questions were asked during the interview to gather helpful information and guide the researchers to develop an effective and valuable web-based conversational chatbot to

reduce the volume of inquiries received by the University's Administrative Offices.

3.6 Development and Design

LARA is a web-based conversational chatbot designed to answer UIC students' queries, allowing the University Administrative Offices staff to focus and address more complex and urgent inquiries. LARA is also developed to classify urgent concerns/matters sent by the users and notify the MIS office to be handled promptly.

(A) AsklUIC

(a) Planning

The researchers identified the current issue and identified the root behind it. To understand the problem better, the researchers conducted a meeting to conceptualize an idea and propose the outcome as the appropriate solution. To strengthen the stance of the study, the researchers sought the assistance of their advisor. They conducted a face-to-face interview with the Management Information Systems (MIS) Office to get their perception of the current problem and the proposed solution. The researchers gathered information from the interview to identify possible methods, approaches, and materials that will be used to carry out the study.

(b) Issues askUIC aims to address

(i) Lessen the number of inquiries

AskUIC lessens the inquiries received by Administrative Offices by answering inquiries regarding enrollment, financial payments, and admission processes, allowing the University Administrative Offices staff to focus and address more complex and urgent inquiries.

(ii) Answer inquiries promptly

Due to a high volume of inquiries, responding and giving feedback to them can take time with AskUIC inquiries regarding enrollment, financial payments, and admission processes can be immediately addressed.

(iii) Improve UIC's support service

Due to a high volume of inquiries, responding and giving feedback to them can take time with AskUIC inquiries regarding enrollment, financial payments, and admission processes can be immediately addressed.

(B) Design

In this phase, the researchers designed the web-based chatbot's prototype by considering the existing UIC portal/system, and they were also able to devise new ideas and alternatives

(i) prototype

The researchers delivered and developed the non-functional prototype of AskUIC using Figma, a collaborative software application for interface design. It allows its users to customize frame sizes, upload images and customize with drag-and-drop editing. The researcher also established the application's flow using the tool's prototype features.

(C) Testing

Upon conducting initial testing, the researchers presented the study. They explained the application's flow,

and following that, the participants were given a survey questionnaire where they were asked about the prototype's design, effectiveness, and usability. The researchers analyzed the participant's responses and discovered functionality and design issues, which they immediately fixed.

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