

RESEARCH PROPOSAL FOR

DESIGN AND IMPLEMENTATION OF CHAT-BOT FOR PROSPECTIVE STUDENTS: UNIVERSITY OF IBADAN ADMISSION UNIT

CSC 476 (Research Methods in Computer science) Project

GROUP 14 MEMBERS

KAYODE PETER TEMITOPE	-	208077
ADELEKE TIMOTHY TOLUWANI	-	214849
AKINRIONOLA BLESSING OPEMIPO	-	214857
SAFIU WAHEED	-	206454

Table of Contents

1.0	INTRODUCTION	3
1.1	INTRODUCTION	3
1.2	THE PROBLEM	4
1.2.1	Variables and Relationships	4
1.3	BACKGROUND	5
1.3.1	The University of Ibadan Admission Office	5
1.3.2	Advancement in Technology	6
1.3.3	Why a Chatbot is needed	7
1.4	AIM AND OBJECTIVES	8
2.0	METHODS.....	10
3.0	EXPECTED RESULT	12
3.1	Enhanced Prospective Student Engagement	12
3.2	Improved Staff Efficiency	12
3.3	Streamlined Admission Process	12
3.4	Data-Driven Decision Making.....	13
3.4	Enhanced Security and Privacy	13
	REFERENCES.....	14

1.0 INTRODUCTION

1.1 INTRODUCTION

The intersection of academics and technology has created innovative potential in the rapidly changing world of higher education. With each passing year, universities worldwide find themselves increasingly entwined in a complex web of admissions, where prospective students, ambitious and inquisitive, seek to unlock the doors of knowledge and opportunity. In the heart of this educational crucible stands the venerable institution known as the University of Ibadan, a citadel of learning with a storied history and a profound commitment to excellence. A silent revolution is about to start in this esteemed university, one that promises to transform the very dynamics of student admissions. This revolution is being geared by the convergence of Computer Science, Natural Language Processing, and Artificial Intelligence.

For prospective students aspiring to embark on their academic journeys, the university admissions process serves as the inaugural step, a step that, though teeming with promise, is often laden with complexity and confusion. It is here that the need for innovation becomes acutely evident. As the University of Ibadan continues to attract a diverse group of ambitious individuals, each bearing a unique set of dreams and questions, the existing manual system finds itself ensnared in a web of inefficiency. Prospective students must navigate a confusing knot of admission procedures, deadlines, course options, and application status updates in their quest to open the door to knowledge.

The admissions staff, valiant stewards of knowledge and gatekeepers of the institution, labour tirelessly to respond to an ever-increasing deluge of inquiries. Yet, despite their dedication, the process often falters. The potential for human error, delays, and inconsistency in responses looms large. Prospective students, driven by dreams, are most times faced with frustrations that stem not from the rigour of academics but from the friction in the admissions process. This disconnect between the ambitious young people's goals and an established institution's practical issues begs for closure.

The stage is now set for a positive shift in operation. The research project "Design and Implementation of a Chat-Bot for Prospective Students: University of Ibadan Admission Unit" arises at the intersection of technological prowess and academic ambition. This project, firmly rooted in the field of Computer Science, carries the banner of Artificial Intelligence and Natural Language Processing. It aims to usher in a new era in which communication barriers dissolve and technology serves as a link between desire and accomplishment.

In the University of Ibadan, a silent revolution is underway, where the concept of a chat-bot, driven by the power of AI, emerges as the brain of transformation. A chat-bot set to provide answers, guidance, and clarity to the multitude of queries posed by prospective students, alleviating their uncertainty and paving the way for seamless interactions with the admission

process. With the precision of algorithms and the elegance of language processing, this chat-bot stands to redefine the admissions experience, making it more intuitive, efficient, and responsive.

Successful completion of this project will usher in an era where the admissions process at the University of Ibadan transcends the confines of traditional paperwork, welcoming students into a world of clarity, efficiency, and personalized guidance. For the University, it represents a landmark in operational efficiency, allowing staff to refocus their energies on strategic initiatives. For the prospective students, it ushers the opportunity to embark on their academic journey with confidence, knowing that the gates to knowledge are not just open but accessible at their fingertips.

1.2 THE PROBLEM

The admissions process at a prestigious institution like the University of Ibadan is mostly complex. As the institution attracts a diverse pool of applicants, each with their unique set of queries and concerns, the existing manual system faces significant challenges. Prospective students, eager to embark on their academic journey, encounter difficulties navigating through the shadows of admission requirements, deadlines, course information, and application status updates. The admissions staff, burdened by the sheer volume of inquiries, are often unable to provide timely and accurate responses, leading to frustration and delays. The need for a solution that can effectively bridge the gap between the university's administrative unit and its aspiring students has become paramount.

1.2.1 Variables and Relationships

1. Prospective Students: These are the key stakeholders in the admissions process, seeking information and assistance on a range of admission-related inquiries, including eligibility criteria, application status, deadlines, and course offerings.

2. Chat-Bot: The heart of this research project, the chat-bot represents a sophisticated AI and NLP-driven system. Its primary role is to engage with prospective students, interpreting their queries, and delivering accurate and timely responses.

3. University of Ibadan Admission Unit: This administrative body plays a crucial role in overseeing the admissions process. Through the chat-bot, they can monitor its performance, provide guidance, and access invaluable insights into the types of inquiries and challenges faced by prospective students.

The relationships within this system are dynamic and interconnected:

- a. Prospective students interact with the chat-bot to seek information and guidance throughout the admissions journeys
- b. The chat-bot, driven by advanced AI and NLP algorithms, serves as the primary interface, understanding and responding to prospective students' queries effectively
- c. The University of Ibadan Admission Unit utilizes the chat-bot as an essential tool to streamline operations, gain insights, and offer guidance where needed.

1.3 BACKGROUND

In this section of the proposal, we will delve into why the problem is important. We checked others who have worked on the similar problems and the methods that were used and the result of their research. It is also important to take a brief look at the University of Ibadan admission Office and how the why this research is important for them.

1.3.1 The University of Ibadan Admission Office

The University of Ibadan, situated within the Academic division, plays a pivotal role in shaping the academic future of aspiring students. Specifically, the Admission Office is entrusted with the crucial task of facilitating admissions for qualified candidates across the diverse academic programs offered by the university.

This intricate process adheres to a set of established rules and regulations that govern the admission procedure. Annually, the office orchestrates and oversees the entire admission process, commencing with the dissemination of information on the university's website, official bulletins, and prominent national newspapers. This initial phase serves to herald the beginning of the admission cycle. Applicants seeking admission are encouraged to upload their credentials online, which are subsequently gathered, sorted, and meticulously processed in alignment with the stipulated admission criteria. Following this thorough evaluation, the names of successful candidates who have successfully completed the Admission Post-UTME Tests are submitted to the Joint Admissions and Matriculation Board (JAMB) in Abuja for the requisite approval.

This detailed process underscores the complexity and importance of the admission unit's responsibilities within the broader context of the University of Ibadan.

1.3.2 Advancement in Technology

As the admission process is such a strenuous one, automation has been introduced in recent years to streamline operations in the University of Ibadan's Admission office. Advances in technology and rise of chatbots and AI have provided an opportunity to solve these challenges. According to a survey conducted by Intelligent, a prominent online education magazine catering to prospective college applicants, a significant shift towards AI adoption is apparent. Presently, half of educational admissions departments have already embraced AI, and an impressive 82% are poised to incorporate it into their operations by 2024. Moreover, a notable trend emerging from this adoption is that a substantial majority of educational institutions using AI entrust it with the final decision-making authority on applicants, emphasizing the growing confidence in AI's capabilities. (Intelligent, 2023).

However, it is essential to acknowledge that, as this transformative technology takes center stage, it has raised ethical concerns among admissions professionals. As per the same survey, two out of every three admissions professionals express concerns about the ethical implications of AI in the admissions process.

The primary driving force behind this shift towards automation in the case of the University of Ibadan is the pursuit of efficiency. Notably, the introduction of automation has led to a significant reduction in manual labour, especially in critical tasks such as scoring candidates' results to determine eligibility for the Post-UTME Tests. Additionally, the transition to online submission of credentials marks a substantial departure from the past when candidates were required to travel to Ibadan in person to submit their results by hand. These advancements have not only streamlined operations but have also markedly improved the overall efficiency and accessibility of the admission process. (University of Ibadan, n.d.).

Nevertheless, new challenges have surfaced as the volume of inquiries about admission at the University of Ibadan continues to grow. Traditionally, prospective students have been reliant on manual methods such as phone calls or emails to seek information regarding admission procedures, application deadlines, and requirements. Additionally, some students have resorted to asking their peers to gather information on their behalf. This traditional approach presents several limitations.

Firstly, it is marred by inconsistencies in information provision. Information relayed through these methods might vary from one source to another, leading to confusion among prospective students. Secondly, this manual approach is not accessible around the clock. In an era where students demand instant responses, the limited availability of these manual channels can hinder the admission process.

Moreover, the traditional methods are undeniably time-consuming. Students must allocate substantial time to make inquiries and await responses, which can be a significant inconvenience, particularly during critical admission periods.

Furthermore, the manual approach leaves ample room for incorrect information to be conveyed, leading to misguided decisions by students. These inaccuracies can have serious consequences for prospective students who may misinterpret the requirements or deadlines.

Perhaps most significantly, the delays inherent in the traditional methods can result in students losing interest or enthusiasm for pursuing their admission. In the fast-paced digital age, the wait for responses can be frustrating and disheartening, potentially deterring talented students from choosing the University of Ibadan.

It is at this juncture that the need for a chatbot tailored to prospective students becomes evident. A chatbot can bridge the gap by providing prompt, accurate, and consistent information, thereby addressing the various challenges associated with the traditional admission inquiry methods.

1.3.3 Why a Chatbot is needed

“Although conversing with a bot is not the same as speaking with a human, messaging a friend is the closest analogous experience. Since users are still getting used to bots, it is reasonable to take those interactions as samples of how a bot should behave”.

Szymon Rozga. Source: (Rajnerowicz, 2022)

Chatbots have become increasingly popular in the education sector due to their ability to provide students with immediate feedback, quick access to information, and personalized guidance and support. Since the COVID-19 pandemic, there has been a considerable shift in the way education is being delivered. Global e-learning is expanding at lightning speed and is expected to grow at a compound annual growth rate of 9.1% by 2026. The availability of distance learning and online courses means that people can learn alongside working and don't have to commute long distances or take a break from family life to learn new skills. This growth demands that educational institutions offering online learning provide excellent student support alongside it. Queries before, during, and after enrollments must be received efficiently and solved instantly. Chatbots for education deliver intelligent support and provide on-the-spot-solutions to alleviate doubts, provide additional information and strengthen the relationship between students and the institution. (Freshchat, n.d.)

A chatbot emerges as a versatile solution for prospective students seeking information about courses, scholarship opportunities, application deadlines, and other vital details offered by the University of Ibadan. It effortlessly handles diverse queries and efficiently directs users to the precise information they seek. One of the primary reasons for its necessity is the accessibility it provides—information can be accessed 24/7, an invaluable feature, particularly within the realm of education where prospective students may have inquiries at any hour.

Moreover, chatbots excel in managing a high volume of inquiries concurrently, significantly reducing the time prospective students spend awaiting responses. This efficiency not only expedites the admission process but also diminishes the risk of misinformation. Chatbots, being consistent in their responses, ensure that all users receive accurate, standardized information, eliminating confusion and ensuring a seamless experience for everyone interacting with them.

The introduction of chatbots into the admission process doesn't just benefit students; it also offers substantial advantages to the institution. By collecting data on user interactions and feedback, chatbots can provide valuable insights. This includes information on frequently asked questions, peak inquiry hours, and the geographical areas with the highest interaction rates. This data, in turn, can inform improvements in the Admission Office's processes and enhance the overall user experience.

Furthermore, embracing chatbot technology for the admission process positions the University of Ibadan as a beacon of innovation and a pioneer in enhancing the student experience. This, in itself, can serve as a compelling competitive advantage, attracting a greater number of prospective students who seek institutions committed to evolving with modern trends and prioritizing student satisfaction.

In addition to these benefits, there are many research studies that have been conducted on the use of chatbots in education. For instance, a study by Kapture CRM found that AI chatbots for education make learning more dynamic and lessen a student's uncertainty about various study areas by providing the answers they need (Singh, 2022). Another study by Comm100 found that chatbots in education can expand support hours, improve support to international students, and increase engagement – all while reducing costs of traditional support. (Rogerson, 2022)

1.4 AIM AND OBJECTIVES

The aim of this project is to design and implement a chatbot for prospective students that will help streamline the admission process and provide students with quick and easy access to information they need about admission requirements, application deadlines, and other relevant information.

The objectives are as follows

1. To develop a chatbot that can answer frequently asked questions about admission requirements, application deadlines, and other relevant information.
2. To provide prospective students with quick and easy access to information they need about admission requirements, application deadlines, and other relevant information.
3. To reduce the workload on staff members by automating the process of answering frequently asked questions.

4. To improve the efficiency of the admission process by providing prospective students with a more efficient way to get the information they need
5. Evaluate the chatbot's impact on reducing the workload of admission staff and improving the efficiency of handling inquiries.

To measure user satisfaction with the chatbot and assess its effectiveness in enhancing the admission experience.

2.0 METHODS

Designing and implementing a chat-bot for prospective students in the Admissions unit of a university, especially the University of Ibadan, requires careful consideration of various methods and approaches.

The proposed chatbot will be designed and implemented using the following methods:

1. **Requirements gathering:** The first step will be to gather requirements from the admission unit of the university. This will involve interviewing staff and students to understand what they need from a chatbot. We will conduct focus groups to gather insights from staff and students, and administer user surveys to obtain their input and preferences regarding the chatbot's functionalities and features.
2. **Chatbot design:** Once the requirements have been gathered, the chatbot will be designed. This will involve defining the chatbot's capabilities, its user interface, and its knowledge base. In addition, the design phase will encompass creating a personality and tone for the chatbot that aligns with the university's branding and values. We will outline the use cases and user stories, and visually represent the chatbot's functionality through flowcharts and wireframes.
3. **Chatbot development:** The chatbot will be developed using a chatbot development platform. This platform will provide the necessary tools and infrastructure for building and deploying the chatbot. We will outline the integration of a Natural Language Processing (NLP) library, and incorporation of a machine learning library to define the chatbot's capabilities, user interface, and knowledge base.

The organisation of educational activities for students to create chat bots emphasises the importance of teamwork, the use of templates and scripts, and the choice of project topics (Mamaeva, Gerasimova, Zaslavskaya & Shunina, 2022). These features can be applied in the context of designing a chat-bot for prospective students, as they facilitate collaboration and streamline the development process (Mamaeva et al., 2022).
4. **Chatbot testing:** The chatbot will be tested thoroughly before it is deployed, including unit testing, integration testing, and user acceptance testing. This process ensures a rigorous examination of the chatbot's functionality, accuracy, and performance before deployment, guaranteeing a seamless experience for prospective students.
5. **Chatbot deployment:** Once the chatbot has been tested and approved, it will be deployed to the university's website. By deployment, it means the chatbot will be hosted on the university's website using a chosen hosting provider. Additionally, it will be seamlessly integrated into the university's website, which is managed through a Content Management System (CMS) for efficient content updates and maintenance.

With these, the design and implementation of a chat-bot for prospective students in the University of Ibadan Admissions unit can benefit from a combination of educational activities, information retrieval and text summarization techniques, gamification elements, and machine learning approaches. By incorporating these methods, the chat-bot can effectively engage with prospective students, provide accurate and concise information, and offer personalized recommendations and assistance.

Throughout the development process, the chatbot will be evaluated using a variety of metrics, such as accuracy (the percentage of user queries that the chatbot can answer correctly), completeness (the percentage of user queries that the chatbot can answer in a comprehensive and informative way), and satisfaction (the level of satisfaction that users have with the chatbot).

The results of the evaluation will be used to improve the chatbot's design and implementation.

Several relevant references provide insights into different aspects of chat-bot design and implementation.

Guha (2021) presents a novel conversational interface chat-bot application with information retrieval and text summarization skills. This method can be valuable for designing a chat-bot that provides accurate and concise information to prospective students. By incorporating information retrieval and text summarization techniques, the chat-bot can efficiently retrieve relevant information and present it in a concise manner.

Additionally, Ong et al. (2021) discusses the coding of a Telegram Quiz Bot to aid learners in a specific subject area. This highlights the use of gamification and group competition to engage students. Incorporating similar elements of gamification and competition in the design of the chat-bot for prospective students can enhance their interaction and motivation to explore the university's offerings.

Furthermore, Patange, Bhadrashetty & Kodli (2022) focuses on the application of machine learning in developing a chat-bot for disease prediction and treatment recommendation. Although the specific context differs, the use of artificial intelligence and machine learning techniques can be relevant in designing a chat-bot for prospective students. These techniques can enable the chat-bot to provide personalized recommendations and assistance based on the students' preferences and needs.

3.0 EXPECTED RESULT

The design and implementation of a chatbot for prospective students at the University of Ibadan Admission Unit offer a promising avenue for improving the admission process and enhancing prospective students' experiences. This innovative approach establishes a pedagogical model where students can address inquiries, seek information on admission procedures, and engage in reflective discussions, all facilitated by the chatbot's starting questions.

3.1 Enhanced Prospective Student Engagement

Prospective students extends beyond just providing information. It will encourage applicants to interact with each other, promoting discussions on shared experiences and concerns. By fostering a sense of belonging and community, this engagement can potentially lead to long-lasting relationships among applicants, benefiting their overall university experience and encouraging them to become active members of the University of Ibadan community.

3.2 Improved Staff Efficiency

The chatbot's ability to handle routine tasks will free up admission staff to provide more personalised support. This enhanced staff efficiency will not only lead to more effective and tailored assistance for applicants but also enable the staff to engage in more strategic and high-impact activities, such as targeted outreach to potential students or improving admission policies based on their interactions with the chatbot.

3.3 Streamlined Admission Process

The streamlined admission process will not only reduce the time needed for application completion and decision notification but will also lead to greater transparency in the process. Prospective students will have a clearer understanding of each stage of the admission process, reducing anxiety and improving the overall experience. Additionally, the improved efficiency will allow the university to attract a broader pool of applicants, including international candidates who may have tight timelines.

3.4 Data-Driven Decision Making

The data analysis performed by the chatbot will extend to providing insights into broader admission trends and patterns. University administrators can use this data for strategic decision-making, such as identifying the most effective recruitment strategies or understanding changing applicant preferences. This holistic approach to data-driven decision-making will enable the University of Ibadan to continuously adapt and stay competitive in the evolving landscape of higher education.

3.4 Enhanced Security and Privacy

The chatbot's commitment to data security and privacy compliance will extend to building trust and credibility for the university. Prospective students and their families will have confidence in the institution's commitment to safeguarding their personal information. This trust is essential in a time when data breaches and privacy concerns are prevalent, and it will positively impact the perception of the university as a whole.

REFERENCES

- Freshchat. (n.d.). *Chatbot for Education: Use Cases, Benefits, Examples - Freshchat*. Freshworks. Retrieved October 17, 2023, from <https://www.freshworks.com/live-chat-software/chatbot-for-education/>
- Guha, R. (2021). Designing a Chat-bot for College Information using Information Retrieval and Automatic Text Summarization Techniques. *Current Chinese Computer Science*, 1(1), 42-51. <https://doi.org/10.2174/2665997201999201022191540>
- Intelligent. (2023, September 27). *8 in 10 Colleges Will Use AI in Admissions by 2024*. Intelligent. Retrieved October 17, 2023, from <https://www.intelligent.com/8-in-10-colleges-will-use-ai-in-admissions-by-2024/>
- Knox, L. (2023, October 9). *Admissions offices turn to AI for application reviews*. Inside Higher Ed. Retrieved October 17, 2023, from <https://www.insidehighered.com/news/admissions/traditional-age/2023/10/09/admissions-offices-turn-ai-application-reviews>
- Mamaeva, E. A., Gerasimova, E. K., Zaslavskaya, O. Y., & Shunina, L. A. (2022). Organization of Educational and Project Activities of Students to Create Chat Bots as a Condition to Train Future Teachers. *European Journal of Contemporary Education*, 11(3), 1. <https://doi.org/10.13187/ejced.2022.3.817>
- Ong, J., Mohan, P., Han, J., Chew, J., & Fung, F. (2021). Coding a Telegram Quiz Bot to Aid Learners in Environmental Chemistry. *Journal of Chemical Education*, 98(8), 2699-2703. <https://doi.org/10.1021/acs.jchemed.1c00201>
- Patange, A. D., Bhadrashetty, A., & Kodli, S. B. (2022, December). Chat-bot Disease Prediction and Treatment Recommendation Using Machine Learning. *International Research Journal of Modernization in Engineering Technology and Science*, 4(12), 2. <https://doi.org/10.56726/irjmets32483>
- Rajnerowicz, K. (2022, May 23). *30+ Best Quotes About Chatbots and Technology*. Tidio. Retrieved October 17, 2023, from <https://www.tidio.com/blog/brainy-quotes-about-chatbots-and-technology/>
- Rogerson, K. (2022, April 20). *The Real Benefits of Chatbots in Higher Education*. Comm100. Retrieved October 17, 2023, from <https://www.comm100.com/blog/the-real-benefits-of-chatbots-in-higher-education/>

Singh, V. (2022, June 8). *11 Benefits of Using AI Chatbot in the Education Sector - Kapture CRM*. Kapture CX. Retrieved October 17, 2023, from <https://www.kapturecrm.com/blog/11-benefits-of-using-ai-chatbot-in-the-education-sector/>

University of Ibadan. (n.d.). *THE UNDERGRADUATE ADMISSIONS OFFICE | UNIVERSITY OF IBADAN*. University of Ibadan. Retrieved October 17, 2023, from <https://ui.edu.ng/content/undergraduate-admissions-office>