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Utilization of Artificial Intelligence in Chatbot Development for New Student Admission Support at Cokroaminoto University Palopo

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ABSTRACT

This research endeavors to create an artificial intelligence-based chatbot to serve as a supporting tool for the New Student Admission (PMB) process at Cokroaminoto University Palopo. The applied system development method is the waterfall method, encompassing distinct stages such as analysis, design, implementation, testing, and maintenance. The primary objective of this study revolves around the design and execution of a chatbot capable of delivering information and assistance to prospective new students throughout the admission process. During the analysis stage, the identification of user needs and scenarios took precedence, providing valuable guidance for the subsequent development of the chatbot. System design comprises critical aspects such as the selection of artificial intelligence algorithms and the creation of a user-friendly interface. The implementation phase involves the development of a chatbot prototype that harnesses the capabilities of artificial intelligence technology. Anticipated outcomes from this research include the enhancement of efficiency and quality in the new student admission services at Universitas Cokroaminoto Palopo. By integrating advanced technology into the admission process, the chatbot is expected to streamline procedures and contribute to an overall improvement in the services provided to prospective students. This innovative approach aligns.

INTRODUCTION

Admissions is an important phase in the life of a university, which requires an efficient and responsive process to meet the needs of prospective students (Narizki et al., 2023). In the era of information technology development, the utilization of Artificial Intelligence (AI) and chatbots has become an attractive alternative to improve the student admission experience (Ramadhan, 2023). Cokroaminoto University Palopo, a progressive educational institution, realizes the strategic value of applying the latest technology to improve new student admission services. This research aims to develop an artificial intelligence-based chatbot as a supporting tool to facilitate the PMB process at this university. By integrating AI technology, the chatbot will be able to provide accurate and timely information, help prospective students in undergoing the admission process more efficiently. Most of the people, especially the Greater Luwu Region.

The registration of new student candidates requires a lot of information about registration procedures in each university. Information facilities for online registration at Cokroaminoto University Palopo through the website page are still limited to general information. Thus, prospective applicants need two-way communication to ask for more detailed information. There is one place for information facilities to serve prospective applicants who want to ask further questions but it is inefficient because of repetitive and similar questions related to registration. To support the need for accurate and up-to-date information related to new student registration, an information technology-based system is needed that can properly summarize various registration data and display the information to users. Chatbot is also known as talkbot, chatterbox, Bot, IM bot or artificial conversational entity. A chatbot is a computer program that mimics human conversation in natural formats including text or spoken language using artificial intelligence techniques such as Natural Language Processing (NLP), image and video processing, and audio analysis (Guntara, 2022).

This research uses a system development approach by applying the waterfall method. This method was chosen because it provides a clear structure in the analysis, design, implementation, testing, and maintenance stages, which suits the purpose of developing a chatbot for PMB. The analysis stage involves identifying user needs and mapping user scenarios to guide the development of the chatbot. The system design includes the development of a friendly user interface.

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The implementation includes the creation of a chatbot prototype using technology in the form of the Engati platform.

This research contributes to the development of information systems in the educational environment, especially in the context of new student admissions. By detailing the steps of chatbot development for PMB, it is hoped that this research can provide practical guidance for other educational institutions interested in applying similar technology to improve the quality of service and efficiency of the new student admission process.

LITERATURE REVIEW

This research uses the library study method as a method for collecting research data in the form of journals, articles, and so on. Literature studies are used as a reference for conducting research with several relevant sources. The following is an overview of the literature used in this research:

1. Research conducted by Guntoro, et al with the title "Chatbot Application for Campus Information and Academic Services Based on Artificial Intelligence Markup Language (AIML)" in 2020 produced test results using whitebox and blackbox by 100%. Testing using UAT is 95% (Guntoro et al., 2020).
2. Research conducted by Laksmi Anindyati with the title "Analysis and Design of Chatbot Applications Using the Rasa Framework and Application Maintenance Information Systems (Case Study: Chatbot for New Student Admissions at Astra Polytechnic)" in 2022 using the waterfall model method to find system requirements and design for chatbot applications and chatbot support systems for new student admissions at Astra Polytechnic (Anindyati, 2023).
3. Research conducted by Marline Wijaya, et al. with the title "Designing Chatbot for New Student Admission Information at Stmik Kharisma Makassar" resulted in a web admin chatbot system and LINE chatbot that has successfully met system needs and criteria in black-box testing (Wijaya et al., 2017).
4. Research conducted by M. Rizky Suherlan, et al with the title "Ummibot as a New Student Admission Information Service Media for Muhammadiyah Sukabumi University" in 2023 resulted in the chatbot that had been created and named UMMIBOT succeeded in achieving a level of functionality accuracy of 83.67% (Rizky Suherlan & Pambudi, 2023).
5. Research conducted by Ariyan Zubaidi and Ramdani with the title "Telegram Bot-Based Academic Services and Information at the University of Mataram Informatics Engineering Study Program" in 2019 produced the results of Telegram-based chatbots that have been built by providing various services such as information provision, final project services, field work practice services and writing procedures (Zubaidi & Ramdani, 2019).

METHOD

This research uses a development research design with the stages of needs analysis, system design, implementation, testing, and evaluation. The waterfall approach is used to ensure structure and order in development. Using the Waterfall approach in developing a chatbot system to support the New Student Admission (PMB) process at Cokroaminoto University Palopo.

Waterfall Stages

Planning Stage

At this stage, initial planning is carried out in the form of identifying system requirements, collecting information about PMB, and designing the initial chatbot concept.

Analysis Stage

In the analysis stage, an in-depth analysis of the functional and non-functional needs of the chatbot to support PMB was conducted. Identification of user needs, chatbot functionality, and integration with the PMB system of Cokroaminoto University Palopo was also carried out at this stage.

Design Stage

This section covers the design of the chatbot system, user interface and integration with the PMB system. This design ensures that the chatbot can interact with prospective new students effectively.

Implementation Stage

The chatbot was developed based on the agreed design. Artificial intelligence algorithms were implemented, and integration with the PMB system was performed. The coding process and unit testing were done systematically.

Testing Phase

The chatbot was developed based on the agreed design. Artificial intelligence algorithms were implemented, and integration with the PMB system was performed. The coding process and unit testing were done systematically.

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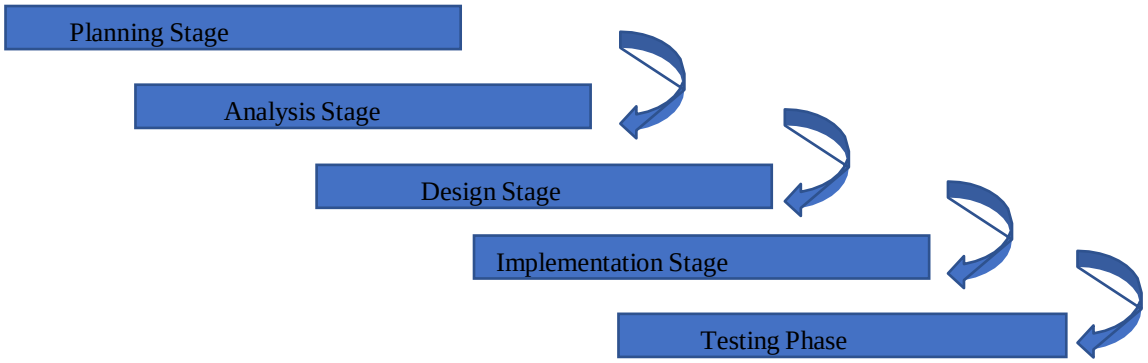


Figure 1. The flow of the Waterfall Method

RESULTS

UML (Unified Modeling Language)

UML (Unified Modeling Language) is a visual modeling model that is used as a means of designing object-oriented designs.oriented systems (Arianti et al., 2022).

System Design

This research uses the UML (Unified Modeling Language) model to model the system design, the following is the system design used in this research:

Use case diagrams of the current system

This use case describes the current system used at PMB (New Student Admission) Cokroaminoto University Palopo. Currently, when prospective new students want to register or want to contact the PMB (New Student Admission) admin to ask questions related to registration or other matters, they have to get information or contacts they want to contact through promotions carried out by the PMB (New Student Admission) team, social media or the PMB (New Student Admission) website.

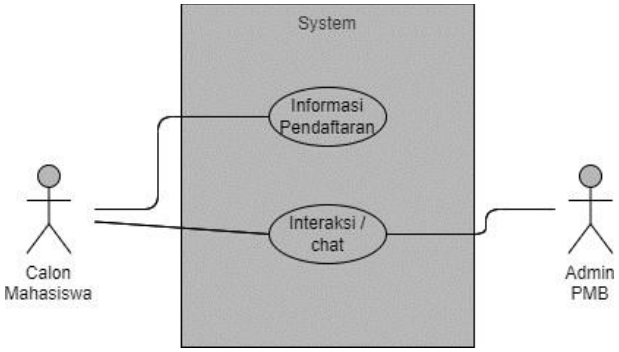


Figure 2. Running system

Proposed system

This use case explains the system that will be built by researchers through a chatbot. In the proposed system, researchers want to build an automated message or chatbot that can provide 24-hour information about several information including; How to register, tuition fees, scholarships, selection paths, registration schedules, faculties and study programs.

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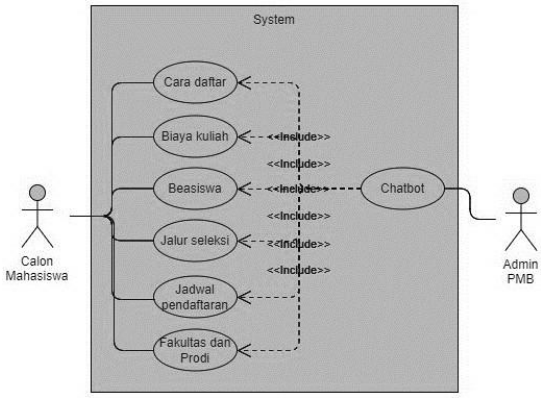


Figure 3. Proposed system

Implementation

This system development uses the Engati platform. System testing uses blackbox testing which is a set of planned and systematic activities to test or evaluate the desired truth. The test activity consists of a set or a set of steps where you can place a test case design that can be used to test the system.

Software testing in terms of functional specifications without testing the design and program code to determine whether the functions, inputs and outputs of the software match the required specifications. The Blackbox testing method is one method that is easy to use because it only requires the lower limit and upper limit of the expected data, the estimated amount of test data can be calculated through the number of data entry fields to be tested, the entry rules that must be met and the upper limit and lower limit cases that are met. With this method, it can be seen if the functionality can still accept data input that is not expected, causing the stored data to be less valid in order to get a high level of accuracy for answers to questions entered by users. Connection to the PMB Website of Cokroaminoto University Palopo.

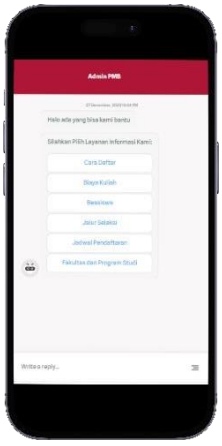


Figure 4. Option Menu Display

The initial display contains the PMB Admin page with information on how to register, tuition fees, scholarships, selection paths, registration schedules and faculties and study programs, each menu option contains information that can be accessed.

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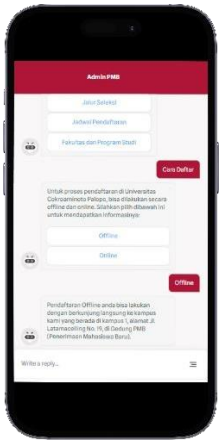


Figure 5. How to register menu

The how to register menu contains information about online and online registration information that can be accessed and provides information regarding how to register new students.



Figure 6. Tuition Menu

On the tuition menu, options and information related to tuition fees will appear which are directly linked to the PMB website portal, making it easier to obtain information related to tuition fees.



Figure 7. Menu of Selection Path, Registration Schedule, Faculty and Study Program

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This menu contains information related to selection paths, registration schedules and faculty and study program information, for the selection path menu contains information related to several paths that can be used and links to the PMB website portal for further selection paths, for the registration schedule will be linked to the website portal menu so as to facilitate users in obtaining information related to the registration schedule for new students at Cokroaminoto University Palopo. The faculty and study program menu contains information about faculty and study program information that can be selected. Then conduct Black Box testing with the results as in the following table:

No.	Test Component	Description	
		Yes	No
1	Enter the portal system website	√	
2	Page menu display	√	
3	View menu of how to register	√	
4	View menu of how to register offline	√	
5	How to register online view menu	√	
6	Tuition display menu	√	
7	Link to the PMB portal (New Student Admission) section of the tuition fee page	√	
8	Scholarship display menu	√	
9	Link to the PMB portal (New Student Admission) section of the scholarship page	√	
10	Selection path display menu	√	
11	Link to the PMB portal (New Student Admission) section of the selection path page	√	
12	Enrollment path display menu	√	
13	Link to the PMB portal (New Student Admission) section of the registration page	√	
14	Faculty and study program display menu	√	
15	Link to the PMB portal (New Student Admission) section of the faculty and study program pages	√	

In the final results of testing using black box, no errors or bugs were found in each functional testing process of the system or web. And to be able to maintain the stability of the function of this system, it is necessary to have clear usage procedures and user restrictions.

DISCUSSION

The main focus of this research is to design and implement a chatbot capable of providing information and support to prospective new students throughout the admission process. At the analysis stage, user needs and scenarios were identified to guide the development of the chatbot. System design includes the selection of artificial intelligence algorithms and a friendly user interface. Implementation involves developing a chatbot prototype that utilizes artificial intelligence technology. It is expected that the results can improve the efficiency and quality of new student admission services at Cokroaminoto University Palopo.

This research contributes to the development of information technology in the context of new student admissions and provides a basis for further research and development in the application of artificial intelligence in the academic environment. In addition, this research also refers to several previous studies that are relevant in the development of chatbots for new student admissions, such as research conducted by Guntoro, et al. (2020), Laksmi Anindyati (2022), Marline Wijaya, et al. (2017), M. Rizky Suherlan, et al. (2023), and Ariyan Zubaidi and Ramdani (2019).

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CONCLUSION

This research emphasizes the importance of an in-depth understanding of system needs and PMB processes asthe basis for chatbot development. It is expected that the resulting chatbot can be an effective tool in providing support and information to prospective new students at Cokroaminoto University Palopo. This research contributes to the development of information technology in the context of new student admissions and provides a foundation for further research and development in the application of artificial intelligence in academic environments.

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