VINEBOT: AN AI-POWERED CHATBOT FOR MINISTRY MANUAL ASSISTANCE

College of Science and Management
BOHOL ISLAND STATE UNIVERSITY
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In Partial Fulfillment
of the Requirements for the Degree
in Bachelor of Science in Computer Science

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APPROVAL SHEET

This thesis entitled **VINEBOT: AN AI-POWERED CHATBOT FOR MINISTRY MANUAL ASSISTANCE** prepared and submitted by Kenneth S. Quibel, Jhon Llyod L. Bolo, Caille I. Membreve, and Giesyl M. Navacilla in partial fulfillment of the requirements for the degree Bachelor of Science in Computer Science has been examined and recommended for acceptance and approval for oral defense.

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-The Thesis Writers

ABSTRACT

Chatbots have enhanced information accessibility through advances in natural language processing and artificial intelligence. This study developed the Blessed Vineyard Ministry Manual Chatbot (VineBot) to address the challenges faced by church leaders and members in navigating the paper-based ministry manual of Blessed Vineyard Ministry-Sagbayan, Bohol. The system utilizes a fine-tuned Mistral 7B generative AI model trained on structured ministry manual data to generate accurate and contextually relevant responses. The chatbot's performance was evaluated using containment rate, fallback rate, and handoff rate. Results revealed a containment rate of 86.2%, a fallback rate of 4.6%, and a handoff rate of 9.2%, indicating that the system can independently resolve most user queries with minimal errors. Additionally, a user satisfaction rating of 4.5 out of 5 demonstrates its effectiveness and reliability. The findings suggest that VineBot reduces workload, improves efficiency, and enhances accessibility to ministry information. Future improvements include model enhancement, dataset expansion, and additional conversational features to further strengthen system performance and usability.

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Chapter 1

THE PROBLEM AND ITS SCOPE

Rationale

An organized administration assists the church in accomplishing its leadership duties efficiently and effectively, in line with the ministry's purpose. Good administrative procedures ensure planning is made, decisions are taken, and there is organizational stability that contributes to overall growth in a church (Crumroy et al., 2023). As the Host Pastor of Blessed Vineyard Ministry-Sagbayan Bohol puts it, the ministry manual is an important guidebook that enables the leaders of the ministry to perform their task confidently and clearly. In following through with the manual, informed decisions would be made, and this allows the smoothing of tasks to be well carried out and conducted in concert with the mission of the ministry.

The conventional use of printed ministry manuals has some drawbacks, according to the Host Pastor of Blessed Vineyard Ministry-Sagbayan, Bohol. He explained that the manual could be hard to search through since leaders have to browse through its pages sequentially in order to obtain the desired information. This activity, he explained, takes a lot of time and frequently breaks ministry leaders' concentration from more vital missionary work. Moreover, when the manual is not immediately available, leaders must exert additional effort to retrieve it, hindering the smooth execution of ministry operations.

To address these challenges, the thesis writers proposed the development of a chatbot suited for the needs of the ministry leaders and members of Blessed Vineyard Ministry–Sagbayan, Bohol. The study was conducted at this church because it expressed its need to improve access to its ministry manual, and previous communications with the church provided the thesis writers with an already established connection to the church, which would help in communication, feedback, and eventually implementing the chatbot. In addition, the Host Pastor believes that putting the manual into a chatbot format would ease the access to information that is needed, and eliminate inconveniences such as flipping through printed pages.

The study, "VINEBOT: An AI-Powered Chatbot for Ministry Manual Assistance," was aimed at overcoming the inefficiencies of manual systems employed in church operations. Blessed Vineyard Ministry wanted to achieve greater operational efficiency through access to necessary information faster, reduced administrative time, and, essentially, increased ministry effectiveness. The project aimed to make the work of the leaders and members of the ministry more effective and rewarding. The implementation of such a technology-based solution showed that Blessed Vineyard Ministry-Sagbayan Bohol was committed to leveraging technology in smoothing the operational elements of the ministry and setting a new standard for innovation within church support systems.

Literature Background

This section covers a comprehensive literature review and related legal bases pertinent to the development and deployment of AI-based chatbots on structured information retrieval. It provides descriptions of prevailing studies, technological frameworks, and pertinent legal provisions that allow for the application of AI in information systems. The following reviews of related studies and legal bases serve as the foundation for this research.

Article XIV, Section 10 of the Philippine Constitution of 1987 recognizes that science and technology are essential for national development. This section emphasizes the need for research, innovation, and technological advancement in all aspects of human life. Therefore, it supplements the thesis writers' study that applies these principles to various areas by using artificial intelligence and natural language processing to improve access to structured information within the Blessed Vineyard Ministry. Also, through the study incorporating AI technology with the aim of digitizing and simplifying manual content retrieval, it assists in supporting the constitutional provision that encourages applying scientific and technological innovations for national development.

In relation to data privacy and protection, Republic Act No. 10173, or the Data Privacy Act of 2012, provides a legal framework for the processing of personal information and a set of standards regarding data security and privacy in the Philippines. According to Section 2 of the Data Privacy Act of 2012 (Republic Act No. 10173, 2012), “It is the policy of the State to protect the fundamental human

right of privacy, of communication while ensuring free flow of information to promote innovation and growth.” In this study, compliance with the Data Privacy Act ensures that ethical data handling procedures are maintained for the AI-powered chatbot system, protecting user confidentiality and securely managing stored data. By following these standards, the study will ensure that information retrieval is done responsibly, in a manner conscious of privacy, and in conformance with the law.

This study adopts the Input-Process-Output model as the conceptual framework. The IPO model is applied to a wide range of research studies for easy identification of the flow or study from the inputs or data collection to the processes such as analysis and interpretation to the final outputs or results. Canonizado (2024) mentioned that the IPO model enables the researchers, especially beginning researchers, to systematize or organize the study and communicate it about key components of the study.

Awasthi and Achar (2025) examined the role of AI technologies, such as chatbots, for improving theological education and church administration. Their work identified a series of processes that highlight the potential of AI for structured access to religious knowledge and in support of pastoral duties, aspects very relevant to this study. Similarly, this study sets out to propose an AI-driven chatbot system for use by ministry leaders seeking easy access to theological data. Additionally, the authors have presented ethical issues that demonstrate that responsible handling of data remains vital, an issue this study also covers.

Further, Andriansyah (2023) reviewed the emerging area of investigation that refers to a combination of artificial intelligence and religious studies in the context of new AI-powered tools such as ChatGPT. His study demarcated how fast AI applications are into other fields; according to the author, at least 50 percent of businesses will be influenced by AI in the coming five years. In relation to religion, he demonstrated major areas of AI research, ethical and theological implications, AI-assisted religious practices, the AI-driven analysis of religious texts, the facilitation of interfaith dialogue, and theological considerations with respect to AI and creation. The study also unveiled the notably growing trend of AI-related religious studies, as manifested in the growing number of scholarly publications and overall interest in the topic worldwide. Andriansyah concluded that scholarly discourse on the given topic should be further expanded in order to understand better the shifting relation between artificial intelligence and religion, emphasizing the place of AI-enabled chatbots within the framework of structured information retrieval in this particular theological perspective.

A similar study by Hirome (2024) explores the implications of AI-driven chatbots for Christian ministry and missional strategy in a world where human-like interactions with AI are becoming increasingly possible. The study raised some theological and spiritual questions as to what, in fact, constitutes human identity in a world where chatbots, like ChatGPT and Bard, can simulate human conversation. Located within missional anthropology, Hirome further insisted that Christian communities pay attention to crafting strategies that would reiterate humans as embodiments of God and valorize spiritual discernment and

relationality over AI-driven responses. The study emphasized that while AI chatbots may serve as modalities of engagement, they cannot replace those aspects of the Christian mission that are deeply relational and incarnational.

Further, Juma (2024) investigated the consequences of resorting to AI technologies like ChatGPT in theological studies, particularly for graduate students in theology. The concerns raised are about the credibility of AI in interpreting holy books, the commission of theological errors by AI, and, above all, the inability of AI to understand religious themes and spiritual discretion by the user. AI can at best be used as a research assistant in theology studies, Juma further articulated, but would never replace critical thinking and originality or input from a member of any theological order. The study emphasized that AI-driven tools must be regarded as supplemental and not authoritative, and that any religious application of AI must ensure that the content retrieved is secure and theologically sound.

In the study by Opene, Chukwuma-Offor, and Nnatuanya (2024), ethical issues in integrating AI into theological training, specifically its effects on spiritual formation and leadership development, were discussed. The study contended that while AI can better expand accessibility and personalization for theological education, it is also more likely to make spiritual mentorship impersonal and properly influence moral training or formation in preparing to lead. Using Virtue Ethics as its framework, the research underlined the irreplaceable role of human mentorship in cultivating ethically and spiritually grounded leaders. The study further recommended hybrid models undertaking AI-driven learning whereby

spiritual formation is imparted by humans so that the basic ideals of theological education would be well-preserved, yet technologically advanced.

Furthermore, Stoddart (2023) gave a critique on the place of AI in pastoral care by noting the difference between AI-supported pastoral care and AI-replaced pastoral care. Researchers believe that while AI is able to perform pastoral work through information and administrative processes, AI cannot replace the empathetic, relational, and spiritually discerning nature of the pastoral caregivers. Stoddart is concerned when issues of compassion and decision-making may be left solely to AI without human intervention. Thus, he approves only of AI-supported pastoral care as it increases human responsibility and does not diminish it. This fits in with the current discussions on the ethics of embracing AI in ministry, claiming human sovereignty over AI-facilitated theological applications.

In addition, Ojieabu (2024) considered the role of Artificial Intelligence in biblical hermeneutics, underlining the potential transition of AI in scriptural interpretation from automation to augmentation. New lenses that AI provides would be necessary for insights and contextual analyses, as well as personal modes of study, to surface, thus advancing understanding. Existing applications that already assist in biblical studies include Logos Bible Software and Bible Analyzer, although the research emphasized the need for a collaborative approach whereby AI enhances but does not replace human theological interpretation. In addition, Ojieabu raised questions of ethics regarding how AI should affect theological discourse and underscored the need for responsible integration in order to preserve doctrinal integrity and scholarly rigor in the field of biblical studies.

Moreover, Reed (2021) showed how artificial intelligence can help in the study of religion through the use of AI in classification and prediction. The study used an online AI system named EMMA to show how machine learning was able to classify New Testament literature into Pauline and non-Pauline literature based on stylistic and chronological features. This finding declares AI as potentially useful in the assistance of the organization and analysis of theological content. However, limitations in interpretive capability from AI were still noted in the study, reinforcing the need for human oversight in theological applications.

On the other hand, Graves (2023) considered the implications of AI, particularly ChatGPT, within theological education, systematic theology, and religious scholarship. The study focused on large language models with the capability to identify and read complex theological texts that could be helpful for research and teaching. Most importantly, Graves noted that AI tools such as ChatGPT are capable of demonstrating faculties that up until recently have only been offered by human judgment: the elucidation of theological concepts at a level of understanding that is quite comparable to that of undergraduate students. AI could act as a useful supplemental resource in theological conversation; it may even create significant ethical implications in terms of authorship, agency, and theological authority. Generally, this study has pointed out its prospects in having a useful way to organize theological inquiry while increasing the ability to access the materials of religion at the university and parish level.

Jiang et al. (2023) proposed Mistral 7B, a language model that seeks to balance high performance with efficiency in computation. Their study showed that

Mistral 7B performs much better compared to larger models such as Llama 2 (13B) on reasoning and code generation benchmarks due to its innovative mechanisms known as Grouped-Query Attention and Sliding Window Attention. The present study relies on this finding because, from this observation, Mistral 7B will be adopted as the main engine of the proposed system, since it is able to provide high-level reasoning with lower memory consumption, thus enabling the chatbot to work on hardware with restricted resources.

Building upon this architecture, Dey and Singh (2025) examined Mistral 7B's optimization using Parameter-Efficient Fine-Tuning and Retrieval-Augmented Generation. They observed that this combination greatly improved the model's coherence in generating domain-specific output, as opposed to the base model. This insight thus directly supports the proposed study's technical approach, confirming that RAG's integration with Mistral 7B forms the needed strategy that will ensure the chatbot retrieves appropriate theological data rather than hallucinating generic responses.

Furthermore, there is the study by Jackson (2023) on harnessing the power of AI-driven, Bible-based chatbots to increase engagement with the Bible. Users' adoption of chatbots was influenced by perceived ease of use, perceived usefulness, and enjoyment. However, adoption barriers identified were issues to do with privacy and security. Jackson's study zeroed in on the need to develop AI-facilitated ministry tools that strike a balance between ease of access, effective engagement, and user trust. This study presents the potential of AI chatbots in

religious applications, reinforcing the centrality of user orientation in developing theological chatbots.

In relevance, Hakim and Anggraini (2023) researched AI applications for religious education, including Islamic studies. They found that AI can enhance learning, facilitate the process of delivering instruction, and support student development. Simultaneously, they identified severe ethical concerns regarding data privacy and the potential to depersonalize religious education. These findings align with ongoing discussions of AI application in theological education, which all the more underlines the need for responsible AI application in ministry-focused chatbot applications.

Additionally, Biana (2024) discussed the ethical and inclusivity concerns regarding religion-based AI chatbots. The study emphasized that while these chatbots offer theological insights, concerns regarding bias and equity cannot be ignored. The study criticized how present chatbots are propagating homogenized religious stances and, at times, perpetuating bias disguised as gender equality. However, to offset such impediments, research proposed feminist re-engineering of AI chatbots by recommending filtering mechanisms and supervised learning algorithms, all in the way of ensuring a more equitable and inclusive theological discussion. This perspective further indicates that, regarding religious applications, fairness and responsible design hold paramount importance in AI chatbots. Only then will the AI-powered theological tooling be unbiased, accurate, and capable of making room for diversity.

Furthermore, Maha et al. (2025) examined the use of artificial intelligence in interpreting religious texts for its potential to increase access to religious knowledge and raise ethical concerns. Their findings confirmed the advantages of facilitating access to theological literature and enhancing efficiency in religious education; however, the researchers also mentioned misinterpretation and the ethical dilemmas regarding AI's role in spiritual guidance. The results confirm that theological applications need responsible AI integration, as reflected in ongoing debates about AI-based chatbots in Christian ministry and religious education.

Additionally, Oyasor (2024) explored how AI technologies like ChatGPT can be potentially used to further religious sustainability in faith communities around Africa. The result indicated that AI-powered chatbots have the capability to improve theological training through structured access to religious teachings and, therefore, promote more involvement within spiritual communities. From this perspective, this study offers an insight that is directly applicable to the current research, where such a chatbot will also prove an effective tool for deepening the theological understanding of the leaders in ministry.

Moreover, Ibrahim et al. (2025) assessed the use of LLMs in the automation of document analysis and the development of AI-driven decision-making. They found that LLM-based chatbots can summarize information, extract key data, and synthesize insights from large collections of texts to enhance efficiency, accessibility, and knowledge management. Though focused on business contexts, such a finding implies broader applications, even in theological settings where structured retrieval of religious documents and context-aware responses are

required. Nevertheless, they highlighted challenges regarding data privacy, computational intensity, and ethical concerns like bias and transparency; these are issues of equal significance in religious and educational domains.

Additionally, Ordóñez-Camacho et al. (2024) explored the application of LLM-based chatbots to institutional help desks, particularly comparing fine-tuning against Retrieval-Augmented Generation (RAG). The results showed that RAG considerably outperformed fine-tuning in embedding domain-specific knowledge without affecting response reliability and, consequently, decreasing AI hallucinations. The outcome is architecturally important for the proposed study; it justifies the use of RAG to ensure that the ministry chatbot retrieves accurate, contextually appropriate information from validated theological sources instead of generating unverified content.

Moreover, Loekito, Tjahyanto, and Indraswari (2024) investigated the creation of a Bible-based chatbot for holistic counseling through the use of advanced neural network models in light of theological and psychological underpinnings. Their work was directed toward developing a context-sensitive chatbot that could respond relevantly and theologically properly to the spiritual journey and counseling needs of each individual. By considering users' preferences, they proposed a natural language processing model attuned to Biblical contexts—meaning that the chatbot could support first Bible study and then, based on the study, provide faith-based mental health guidance. Initial testing indicated an effective delivery of personalized, theologically sound counseling, while future improvements emphasize enhancing its responsiveness and

increasing its adaptability within diverse cultural contexts. This research underlines the potential of AI-driven chatbots to facilitate structured religious discussions and further spiritual engagement.

Additionally, Barrows (2024), explored the use of AI chatbots in religious organizations in terms of recruitment and retention. It was observed that AI-powered interfaces increased access to theological education and amplified commitment among members by facilitating interactive learning spaces. This evidence gives weight to the utility of the proposed project and infers that carrying out such a system at Blessed Vineyard Ministry will directly affect the current challenges on member engagement and training resource accessibility.

The study by Karyotaki, Drigas, and Skianis (2022) showed that AI chatbots enhance information retrieval and decision-making through the use of NLP and machine learning, thereby providing personalized and structured responses in fields such as education. In spite of limitations regarding continuity of conversation and contextual recognition, this study stressed that improvements of chatbots could provide ordered dissemination of knowledge related to situations wherein instant access to correct information is vital.

Furthermore, Nguyen et al. (2021) also developed the NEU-chatbot for immediate responses in an organized fashion to inquiries about admission. These responses have greatly reduced manual workload and attained 97.1% recognition precision in questions. These results show the capability of AI chatbots to ease structured information provision and enhance user interaction. This agrees with

the purpose of this study, which aims at supporting ministry teams by fostering automated access to theological content.

Similarly, Ayanouz, Abdelhakim, and Benhmed (2020) explored advancements in the architecture of chatbots, underlining how natural language processing (NLP) and machine learning enhance structured conversational models. This paper examined a variety of models developed for chatbots, ranging from purely rule-based systems to neural network-based approaches, but placed principal interest in the encoder-decoder recurrent model, which has become lately a popular choice among the AI-driven conversational landscape. The main focus was on chatbots for healthcare, trying to highlight the advances that deep learning can bring to this sector and, therefore, the effectiveness of a chatbot that can provide structured and context-based answers. While they have been mainly applied so far to assist purposes in the health care sector, this paper is an example of the huge involvement of AI chatbots in implicit Structured Information Retrieval, extendable to any sector, thus including education and religious ones.

According to the literature, there is an increasing amount of research on the creation and use of artificial intelligence-based chatbots for structured retrieval of theological information. The literature provides a supportive context on how the inclusion of AI and large language models would be a useful means to better access religious texts, improve theological education, and support administrative functions in ministry. Despite this promise, however, each of the studies raised the question of ethical use, doctrinal integrity, privacy of information, and human-centered care of spiritual connection to humanity.

The thesis writers sought to address the lack of tools to assist with the manual work of the ministry and build VineBot, an AI-driven chatbot. VineBot leverages several leading NLP techniques in assisting, understanding, and responding to questions from ministry staff and church members, giving them direct access to important information embedded in ministry manuals. The core view is not just the creation of efficiencies in ministry but to make the search for help around religious practices and procedures more engaging and seamless. In short, VineBot desires to be a dedicated and trustworthy assistant that ministry staff can use to fulfill daily needs in ministry, thereby connecting the services of the ministry to a larger community.

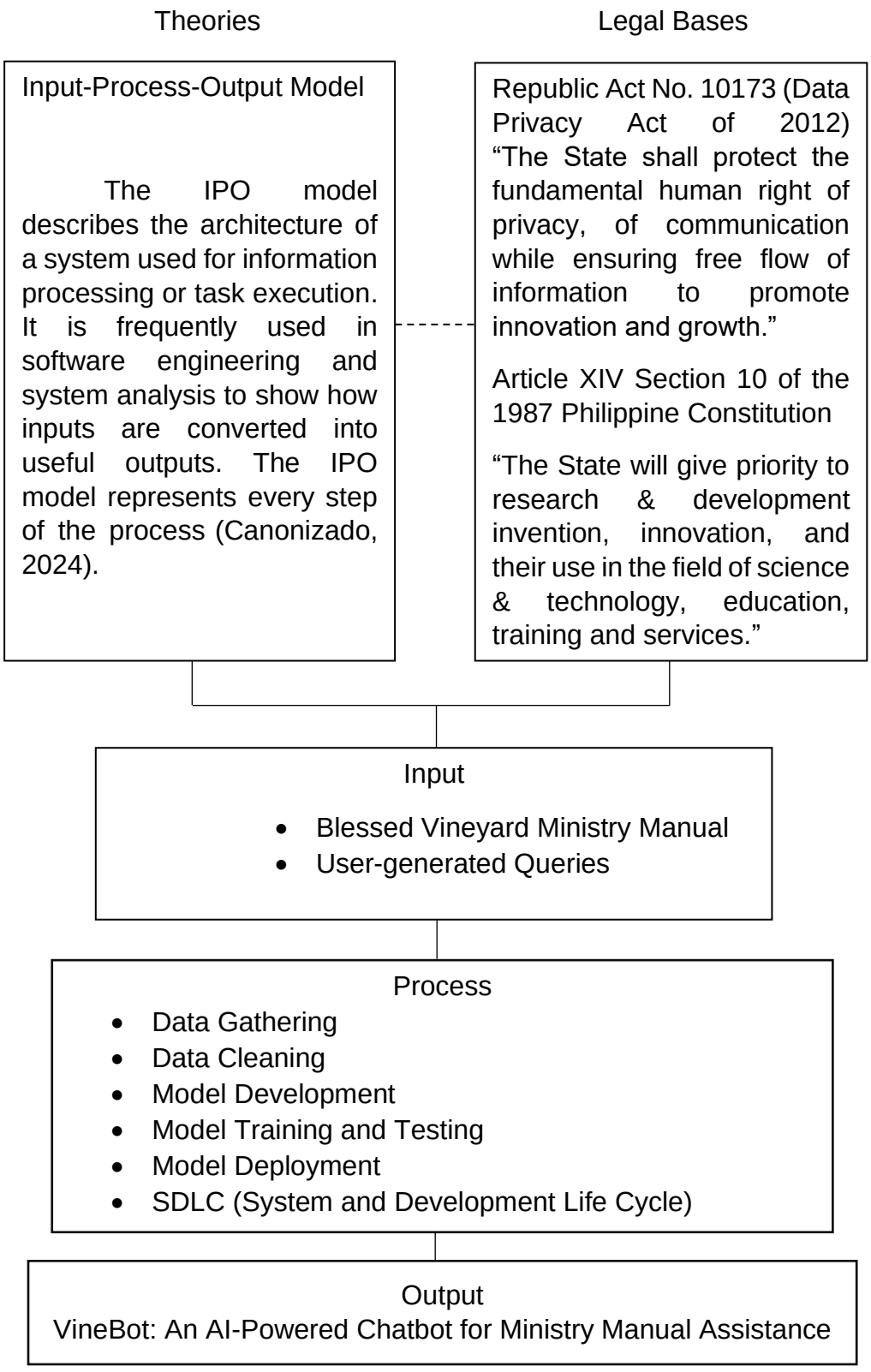


Figure A Theoretical and Conceptual Framework

THE PROBLEM

Statement of the Problem

This study aimed to design and develop a chatbot for the ministry manual at Blessed Vineyard of Christ International Ministries.

Specifically, this study sought to answer the following questions:

1. What is the architecture of the Mistral 7B model?
2. What is the performance of the chatbot in terms of the following metrics:
   2.1 Fallback Rate;
   2.2 Handoff Rate; and
   2.3 Containment Rate?
3. What is the specification of the system in terms of:
   3.1 System Narrative;
   3.2 Conceptual Diagram;
   3.3 Event Specifications; and
   3.4 Flowchart?
4. What is the design of the proposed system in terms of:
   4.1 System Architecture; and
   4.2 User Interface Design?
5. What is the chatbot’s customer satisfaction score?

Significance of the Study

This study was significant to the following:

Church Leaders. The study enhanced the accessibility of a ministry manual through AI-powered chatbots, enabling leaders to quickly access essential guidelines for spiritual leadership, decision-making, and church management.

Pastors. The chatbot makes pastors' jobs easier by giving them quick, accurate answers to common questions about the ministry manual. This enables them to focus more on leadership development, pastoral care, and other crucial church duties.

Ministry Enhancement. This study offered insightful information about the application of AI-powered chatbots that support ministry operations. By incorporating this technology, church leaders can strengthen overall church governance, increase operational efficiency, lessen administrative workload, and make the ministry manual easier to access.

Thesis Writers. The current study assisted researchers in honing their AI-based chatbot design and implementation skills, enabling them to put their theoretical knowledge to use in real-world situations.

Future Thesis Writers. Future researchers working on related subjects can use this study as a guide. It provides insightful information and useful guidance that can improve techniques and expand on previous research.

RESEARCH METHODOLOGY

Design

In this study, the thesis writers utilized a true-experimental research design to develop and determine the process of the proposed study entitled “VineBot: An AI-Powered Chatbot for Ministry Manual Assistance”. Experimental research serves as an important scientific methodology concerned with finding the cause-and-effect relationship among variables involved in various fields (Em, 2023). The true experimental design presents the strongest evidence to establish causal links among variables (Oehlert, 2021).

Environment and Participants

This study was conducted at the Bohol Island State University – Clarin Campus, Poblacion Norte, Clarin, Bohol, which is about 47.7 kilometers from Tagbilaran City. Its campus can be accessed through the Cortes – Balilihan – Catigbian – Macaas Road, and is about an estimated 1 hour and 2 minutes from Tagbilaran City by car in normal traffic conditions. Bohol Island State University (BISU) is a state-funded higher education institution in the province of Bohol, previously named Central Visayas State College of Agriculture, Forestry, and Technology (CVSCAFT). It has its main campus in Tagbilaran City and satellite campuses in Bilar, Candijay, Clarin, Calape, and Balilihan. Clarin Campus is one of the campuses that offer different courses and caters to students coming from neighboring municipalities.

Figure B Location Map (Blessed Vineyard of Christ International Ministry – Bohol Outreach, located in Hillside, Sagbayan, Bohol and Location Map from Tagbilaran City to BISU – Clarin Campus. Map retrieved April 3, 2025, from Google Maps.)

In this study, the participants were the thirteen (13) leaders of the Blessed Vineyard of Christ International Ministry – Bohol Outreach. These leaders were department heads in the following specific ministry departments: Men's, Women's, Kids, Couples, Youth, Media, Music, Intercessors, and Dorcas ministries. The selection criteria for the participants were that they had to be actively playing leadership and coordination roles in the ministry operations, as well as be directly involved in utilizing ministry resources. Since they are the main users and target recipients of the chatbot system, these leaders engaged with an easy-to-use chatbot that would easily extract information from the ministry guide. They evaluated the chatbot's accuracy, usability, and effectiveness, and offer insights regarding their satisfaction with the system's performance.

Instrument

The model used in this study was Mistral 7B, a decoder-only language model from Mistral AI for openness and efficiency in large-scale language modeling (Jiang et al., 2023). It is specifically Mistral-7B-v0.3; this model balances well between performance and computational efficiency and therefore, was considered suitable for fine-tuning in this study. Visual Studio Code served as the Integrated Development Environment (IDE), and Google Colaboratory, also known as Colab, was used for model development and training. Django web framework was utilized by the authors of the thesis for the development of the web application of the chatbot.

Performance Metrics

In order to evaluate the effectiveness and performance of the chatbot system, metrics such as Fallback Rate, Handoff Rate, and Containment Rate were implemented. The definitions and formulas of these metrics were shown below.

$$\text{Fallback Rate} = \frac{\text{Queries not resolved by a bot}}{\text{Total number of interactions with a bot}} \times 100\%$$

Fallback rate represents the proportion of requests for which the chatbot failed to provide a satisfactory answer. A reduced fallback rate indicates a more efficient chatbot, proficient in comprehending and responding to user issues.

$$\text{Handoff Rate} = \frac{\text{Queries routed to human live chat agents}}{\text{Total number of interactions with a bot}} \times 100\%$$

Handoff Rate indicates the percentage of interactions that required human assistance because the chatbot could not deliver a satisfactory answer. A low handoff rate implies that the chatbot is effectively trained and is capable of independently addressing the majority of inquiries.

$$\text{Containment Rate} = \frac{\text{Queries successfully resolved by a bot}}{\text{Total number of interactions with a bot}} \times 100\%$$

Containment Rate describes the number of user queries that are successfully answered by the chatbot alone, without any human intervention. A higher containment rate means that the chatbot is dependable and responsive for a wide variety of questions independently.

$$\text{Customer Satisfaction} = \frac{\text{Total Positive Ratings}}{\text{Total Responses}} \times 100\%$$

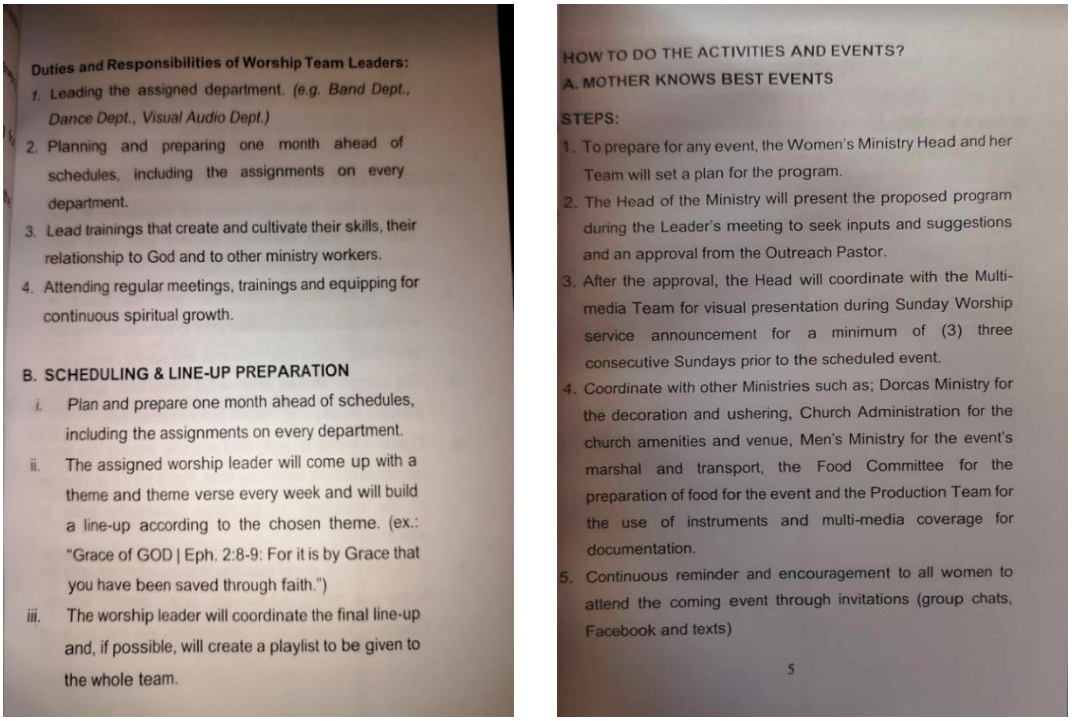
User Satisfaction Rate refers to the contentment of users with the responses provided by the chatbot. This metric was assessed through user feedback and ratings, which helped in assessing if the chatbot meets the expectations of the ministry leaders, pertaining to effective retrieval of information.

Dataset

The dataset for this study was the Blessed Vineyard Ministry Manual Edition 2, which is a foundational document laying down the values, rules, responsibilities, and practices of the Ministry. This handbook is a sourcebook for employees and members of the ministry on the details of roles, the organization of events, and

spiritual conduct in the community. It is an important tool in maintaining consistency and harmony within the Ministry's practices.

The information used for fine-tuning Mistral 7B has been structured and saved to a csv file format meeting the technical specifications of the generative AI model. Included in the dataset are various user questions with responses based on the manual that are intended to be reflective of realistic questions within the ministry context. The structure of this dataset supports VineBot's learning of the right theological language, doctrine specificity, and guidance on procedures for generating accurate and appropriate responses closely aligned with the content of the Blessed Vineyard Ministry Manual Edition 2.



Duties and Responsibilities of Worship Team Leaders:

1. Leading the assigned department. *(e.g. Band Dept., Dance Dept., Visual Audio Dept.)*
2. Planning and preparing one month ahead of schedules, including the assignments on every department.
3. Lead trainings that create and cultivate their skills, their relationship to God and to other ministry workers.
4. Attending regular meetings, trainings and equipping for continuous spiritual growth.

B. SCHEDULING & LINE-UP PREPARATION

i. Plan and prepare one month ahead of schedules, including the assignments on every department.

ii. The assigned worship leader will come up with a theme and theme verse every week and will build a line-up according to the chosen theme. (ex.: "Grace of GOD | Eph. 2:8-9: For it is by Grace that you have been saved through faith.")

iii. The worship leader will coordinate the final line-up and, if possible, will create a playlist to be given to the whole team.

HOW TO DO THE ACTIVITIES AND EVENTS?

A. MOTHER KNOWS BEST EVENTS

STEPS:

1. To prepare for any event, the Women's Ministry Head and her Team will set a plan for the program.
2. The Head of the Ministry will present the proposed program during the Leader's meeting to seek inputs and suggestions and an approval from the Outreach Pastor.
3. After the approval, the Head will coordinate with the Multi-media Team for visual presentation during Sunday Worship service announcement for a minimum of (3) three consecutive Sundays prior to the scheduled event.
4. Coordinate with other Ministries such as; Dorcas Ministry for the decoration and ushering, Church Administration for the church amenities and venue, Men's Ministry for the event's marshal and transport, the Food Committee for the preparation of food for the event and the Production Team for the use of instruments and multi-media coverage for documentation.
5. Continuous reminder and encouragement to all women to attend the coming event through invitations (group chats, Facebook and texts)

5

Figure C (Blessed Vineyard Ministry Manual Edition 2) Sample Dataset

Procedure

This section details the formal process of developing VineBot: An AI-Powered Chatbot for Ministry Manual Support. The process was divided into two broad sections: Model Development, consisting of training Mistral 7B language model on the Blessed Vineyard Ministry Manual, and System Development, following SDLC methodology in the development and deployment of the chatbot system. Both phases in both areas aimed at the successful creation of a reliable, ministry-oriented chatbot to deliver organized theological responses and improve access to important ministry information.

A. Model Development

The Mistral 7B language model was used to provide systematic theological answers that correctly articulate the teachings. The model was developed by fine-tuning from the Blessed Vineyard Ministry Manual. VineBot was developed to provide computer-assisted retrieval of organized theological information, understand, sort out, and answer questions about ministry. This model has been developed using a structured approach so as to ensure a well-built and robust chatbot system.

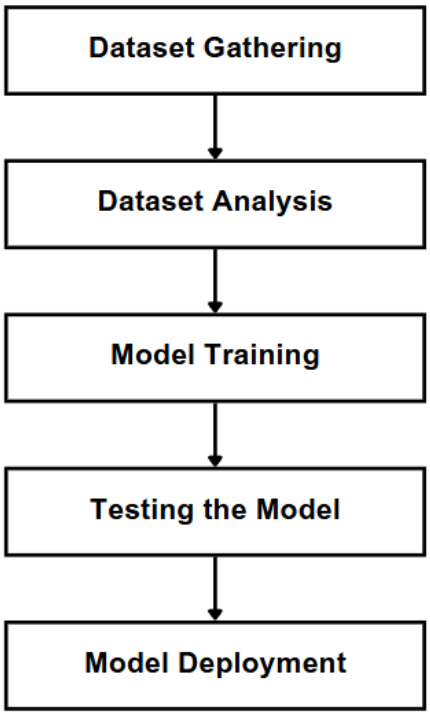


Figure D Model Development

Phase 1. Dataset Gathering

The first step involved the gathering of relevant data, which was directly extracted from the Blessed Vineyard Ministry Manual. The manual provides comprehensive guidelines regarding ministry roles, responsibilities, best practices, and event planning procedures, forming the foundational knowledge base for training the chatbot. The information was then formatted into a structured CSV file so that it is usable for the language model's training.

Phase 2: Data Analysis

After the data was organized, an exploratory analysis had to be done to become familiar with the data structure and its contents. This included cleaning the data of empty fields, tokenizing the text, and tagging entries so that the dataset is

appropriately organized and can be put to practical use in training a chatbot model. In this way, it is ensured that only high-quality, relevant data is used for later model training.

Phase 3: Model Training

The model used the structured dataset in training to identify input patterns and provide responses which are contextually appropriate. Model parameter tuning was done during training to enhance accuracy, relevance, and overall performance in responding to user queries. This part of the process is very important in bringing up the chatbot's capabilities for providing reliable and meaningful user interactions. meaningful user interactions. Iterative training was conducted to check for improvements and avoid situations such as overfitting.

Phase 4: Testing the Model

This phase evaluated the chatbot’s responses to user queries. The chatbot was tested with some sample questions to see if it gives appropriate and correct responses. These test prompts were manually designed to reflect realistic scenarios that users might ask. These were then checked and marked for correctness and appropriateness. Where necessary, updates were made to the model or updated data sets to improve the performance in real-world usage.

Phase 5: Model Deployment

After the model delivered accurate answers reliably during interactive testing, it was integrated into the chatbot. This model enables the chatbot to

effectively predict the categories for questions related to Blessed Vineyard Ministry Manual contents and helped users quickly get information. It marked the shift from the development to application phase, when real-time access to assistance for the members of the ministry would become possible.

B. System Development

The system adopted by the thesis writers was the System Development Life Cycle, which helped them in the development of the system. SDLC is an approach that can be followed to provide a systematic software system plan regarding analysis, design, testing, and deployment (Hossain, 2023). This SDLC helps to ensure that work is appropriately done at each phase, starting from requirements gathering to the completion of the final system. By following the SDLC process, it enabled the thesis writers to develop a software system that is clear, structured, and functional for its purpose.

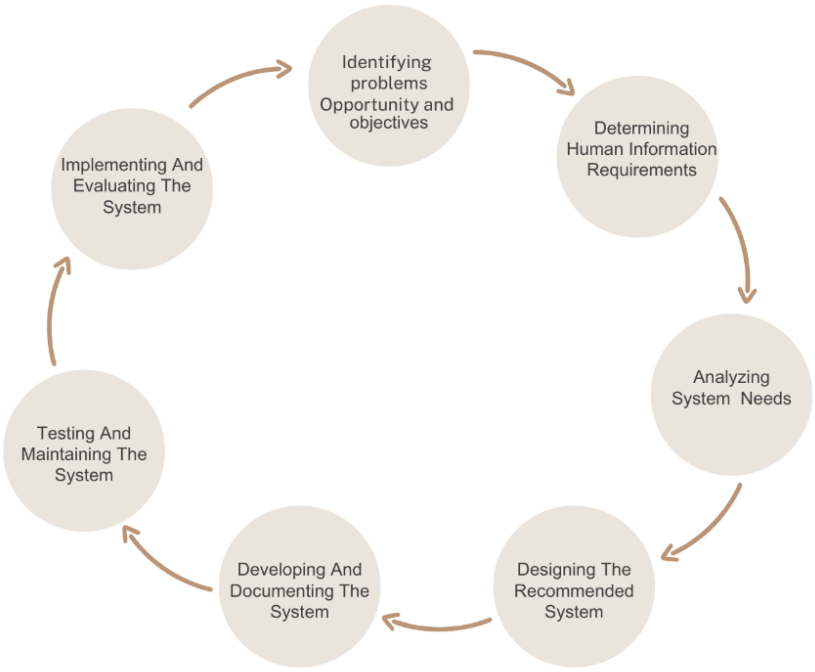


Figure E System Development Life Cycle

Phase 1: Identifying Problems, Opportunities and Objectives

In this stage, the thesis writers identified a common problem among the members of the ministry, the inaccessibility of the Blessed Vineyard Ministry Manual. Most of the members faced difficulty in terms of access and understanding the important information, especially when organizing events or performing their role in the ministry. The accessibility issue with the manual affected how effectively members could carry out duties. This problem was to be overcome by the design of a proposed study called "VineBot: An AI-Powered Chatbot for Ministry Manual Assistance," which would answer questions in natural language and give

responses from the manual in short, useful chunks using plain, understandable language.

Phase 2: Determining functional requirements

During this stage, the thesis writers established what information members of the ministry need when using the Blessed Vineyard Ministry Manual. This process helped to identify the key features and information the system should handle to meet the needs of the users. Through these requirements, the chatbot can be created to offer quick, accurate, and user-friendly responses that would facilitate ease in ministry work.

Phase 3: Analyzing System Needs

During this phase, the thesis writers went through all the requirements gathered to determine whether these requirements were correct, comprehensive, and relevant to the system's purpose. There were functional requirements like correctness of response and information retrieval, along with non-functional ones like usability and performance. The architecture of the system was set according to these requirements, and through them, a successful plan of how each part of the chatbot would function is created. This analysis ensured that the system was functional, effective, and implementable.

Phase 4: Designing the proposed system

Based on the requirements and analysis from previous phases, the overall structure of the chatbot was designed by the writers of the thesis, structured

around the components defined, features, and architecture that enable the system to run smoothly. The user interface of the chatbot system was also to be designed in a way that makes it easy to use, ensuring effective interaction by its users with the system.

Phase 5: Developing and documenting software

Following the design process, this phase focused on constructing the system based on the proposed architecture and features. The thesis writers used Google Colaboratory for conducting model training, Visual Studio Code as the IDE, and Django for writing the backend. These tools aided in the implementation of the core functionality and helped ascertain that the system was working as intended.

Phase 6: Testing and maintaining the system

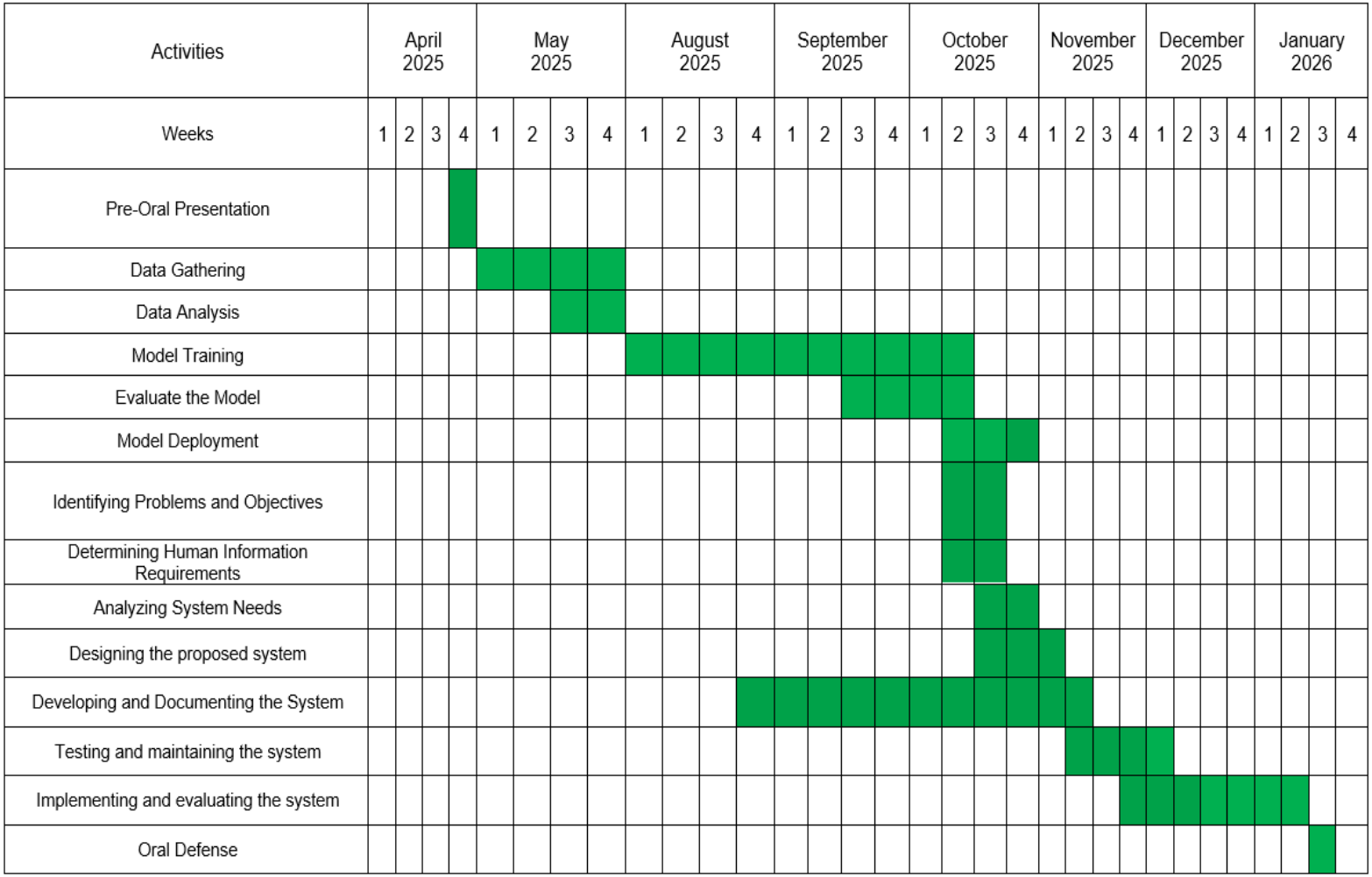
This was the testing phase, where the chatbot system had to undergo exhaustive testing processes to ensure that the system was functioning properly and that the interaction was what was intended and specified by the requirements. The thesis writers identified and fixed bugs, problems, or errors identified through testing. The usability test to capture the feedback of the users and the effectiveness of the user experience was also completed.

Phase 7: Implementing and evaluating the system

The system was applied in the specified ministry environment during this last phase. The performance metrics to be used for the evaluation assessment included accuracy, user satisfaction, and relevance of the responses. The ministry

members obtained feedback from users for usability and general usability. Refinements and modifications based on their experience with the evaluation took place to facilitate system operational and user needs

Gantt Chart


Activities
April 2025
May 2025
August 2025
September 2025
October 2025
November 2025
December 2025
January 2026
Weeks
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4
Pre-Oral Presentation
Data Gathering
Data Analysis
Model Training
Evaluate the Model
Model Deployment
Identifying Problems and Objectives
Determining Human Information Requirements
Analyzing System Needs
Designing the proposed system
Developing and Documenting the System
Testing and maintaining the system
Implementing and evaluating the system
Oral Defense

DEFINITION OF TERMS

These definitions established a common understanding of the key terms used throughout this study, ensuring clarity and consistency in discussing the development and function of VineBot as an AI-powered chatbot for ministry assistance.

Artificial Intelligence (AI). Artificial Intelligence refers to the simulation of human intelligence in machines that are programmed to think, learn, and solve problems. In this study, AI enables VineBot to understand and respond to ministry-related questions.

Blessed Vineyard Ministry Manual. This is the official document used by the ministry to outline roles, doctrines, event planning procedures, and spiritual practices. It serves as the primary source of information for VineBot.

Chatbot. A chatbot is a computer program designed to simulate conversation with human users through natural language. In this study, VineBot serves as the chatbot that provides ministry-related information based on the Blessed Vineyard Ministry Manual.

Conceptual Diagram. A conceptual diagram is a high-level visual representation of how a system functions. It is included in this study to illustrate the overall design and interactions within the VineBot system.

Containment Rate. Containment rate refers to the percentage of user queries that the chatbot is able to handle without requiring human assistance. This metric is used to assess the chatbot’s efficiency and autonomy.

CSV (Comma-Separated Values). CSV is a widely used file format for storing structured data in plain text, with each line representing a data record. In this study, CSV files are used to organize VineBot's training data.

Customer Satisfaction Score. This score measures the overall satisfaction of users with the chatbot’s responses and performance. In this study, it helps evaluate how effectively VineBot meets users’ expectations.

Dataset. A dataset is a collection of data used for training and testing machine learning models. In this study, the dataset consists of ministry-related questions and their corresponding answers.

Decoder-only. Decoder-only refers to a type of transformer architecture that uses only the decoder part of the transformer model, typically for tasks involving text generation and language modeling. OPT-1.3B, used in this study, is based on this architecture.

Django. Django is a high-level Python web framework designed for rapid development and secure web applications. In this study, Django is used to build the backend of the VineBot system.

Event Specifications. Event specifications detail the conditions, triggers, and responses for system events. This study uses event specifications to document the interaction logic of the VineBot system.

Fallback Rate. Fallback rate is the percentage of queries for which the chatbot fails to deliver a suitable response. This metric helps identify gaps in the chatbot's knowledge or training.

Flowchart. A flowchart is a diagram that represents a process or workflow using symbols and arrows. In this study, it helps visualize the flow of logic and decision-making within the VineBot system.

Handoff Rate. Handoff rate indicates the percentage of chatbot interactions that are escalated to a human agent. A low handoff rate suggests that the chatbot is capable of resolving most queries independently.

Hyperparameter. A hyperparameter is a configurable parameter set before training a machine learning model, as opposed to learned parameters. This study outlines the tuning of hyperparameters during model training.

Large Language Model (LLM). An LLM is an AI model trained on large-scale text data to perform various language tasks such as generation, translation, and question answering. VineBot utilizes an LLM to understand and respond to ministry queries.

Machine Learning (ML). Machine learning is a branch of AI focused on developing algorithms that allow systems to learn from data. This study employs machine learning to improve the chatbot's natural language understanding.

Mistral 7B. Mistral 7B is a large language model developed by Mistral AI, with 7 billion parameters. It is engineered to deliver high-quality natural language understanding and generation while maintaining computational efficiency. In this study, Mistral 7B acts as the base model for powering the chatbot in effectively interpreting user inputs and generating coherent, human-like responses.

Natural Language Processing (NLP). NLP is a subfield of AI that enables machines to analyze, interpret, and generate human language. This study integrates NLP techniques to allow VineBot to communicate effectively with users.

Retrieval-Augmented Generation (RAG). Retrieval-Augmented Generation is an AI approach that combines information retrieval with text generation to improve the accuracy and relevance of system outputs. It retrieves contextually appropriate documents or data from an external knowledge source and uses that to guide the model's generated response. In this paper, RAG is implemented such that the answers provided by the chatbot are fact-based and context-aware.

System Development Life Cycle (SDLC). SDLC is a framework for planning, building, and maintaining software systems. This study follows SDLC phases to guide the structured development of the VineBot chatbot.

System Architecture. System architecture refers to the structural design of the VineBot system, including its components such as the AI model, backend, and user interface. This definition supports the analysis of how the system components work together.

System Narrative. A system narrative is a written explanation describing the system's functionality, workflows, and user interactions. This study includes a system narrative to describe how users engage with VineBot.

Tokenization. Tokenization is the process of dividing text into smaller units like words or subwords, which helps the language model understand and process input effectively.

User Interface Design. User interface design involves creating the layout and interaction flow of a software application. This study focuses on designing an intuitive and accessible interface for VineBot to enhance user experience.

VineBot. VineBot is the AI-powered chatbot developed in this study to assist ministry leaders and members in retrieving information from the Blessed Vineyard Ministry Manual efficiently and accurately.

Chapter 2

PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

This chapter presents the findings of the research through data presentation, analysis, and interpretation. The first section gives a representation of the structure of the model with a summary as well as a graphical presentation.

The second section of this chapter compares the actual execution of the chatbot with the main assessment criteria: Fallback Rate, Handoff Rate, and Containment Rate. The third section presents the system specifications: System Narrative, Conceptual Diagram, Event Specifications, and the Flowchart.

The fourth section provides a comprehensive overview of the System Architecture and User Interface Design of the proposed system. The chapter concludes by assessing the performance of the chatbot with regard to the Customer Satisfaction Score as a measure of overall usability.

1. Model Architecture

Model architecture refers to the overall design of a model, specifying how its various components are combined and interact. This architecture provides a model with the ability to take input data, process the data, and generate expected output; it dictates the overall functionality and performance of the model.

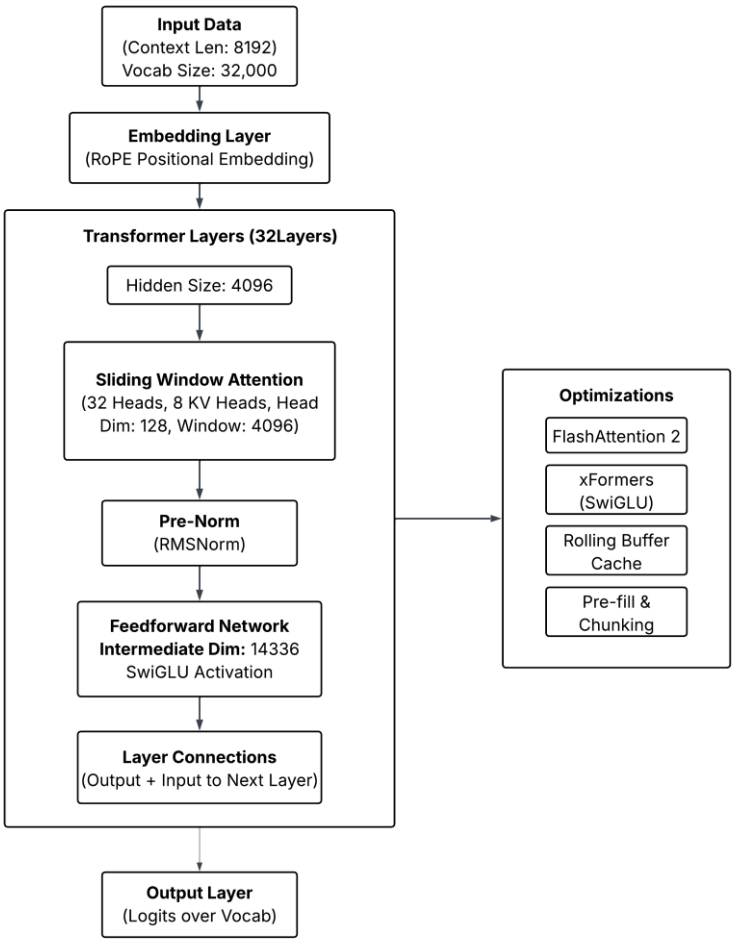


Figure 1 Model Architecture

The thesis writers aimed to develop an AI-based chatbot for ministry manual assistance. Figure 1: Model Architecture of Mistral 7B The model's vocabulary comprises 32,000 unique tokens, enabling it to handle a wide range of words and sub-words with efficiency. It also accepted input sequences up to 8,192 tokens in length, letting it process long documents without leaving critical details behind.

The embedding layer turned the input tokens from the token vocabulary into a dense vector representation. This enabled the model to understand the meaning of words and sub-words in a more nuanced way, beyond their surface form.

Additionally, Rotary Position Embedding (RoPE) encodes the position of tokens in a sequence, which lets the architecture know the order and relative positions of tokens. This is important for understanding longer sequences of text where meaning depends on context.

The embedded input flows into a stack of 32 Transformer Layers, each having a hidden size of 4,096. These layers form the heart of the model, repeated to develop a deeper understanding. Within each Transformer Layer, the first element is Sliding Window Attention having 32 attention heads, 8 key-value (KV) heads, a head size of 128, and a window size of 4,096, saving computations for long context but being efficient. Pre-Norm uses RMSNorm (Root Mean Square Normalization) to normalize the data to make it stable for training. Normalized data flows to the Feedforward Network, which expands to an intermediate size of 14,336 and subsequently compresses the representations to cope with complicated transformations. SwiGLU (Swish-Gated Linear Unit) is an activation that gates the output to have better expressiveness, enhancing the performance of the model in language tasks.

Finally, all transformer levels connect through the residual connections so that before sending the next layer, the input with the output of that layer are added together, which helps with stability during training. Ultimately, the output layer that creates logits over the 32,000-token vocabulary to predict the next token in the sequence receives the processed representations after the entire stack. Techniques such as FlashAttention 2, xFormers for SwiGLU, a rolling buffer cache,

and pre-fill with chunking have improved the model inference to be fast and memory efficient, thus making it suitable for real-time chatbot applications.

Table 1

Hyperparameters

Hyperparameters	Scores
Batch Size	2
Optimizer	adamw_torch
Learning Rate	5e-5
Save Strategy	epoch
Epochs	3
Mixed Precision (enabled)	Fp16
Batch Size	2

Table 1 shows the hyperparameters that were used to optimize and fine-tune the Mistral 7B model. The batch size was set to 2; a smaller batch size helps reduce memory usage, which is suitable for fine-tuning large models like Mistral 7B. The optimizer utilized was adamw_torch, which helps in improving generalizations and stability. The learning rate was 5e-5 to define the amount of weight updates through the training phase. The save strategy was set to epoch; the model state is saved at the end of every training epoch. The number of epochs refers to how many times the model goes through the whole dataset. Setting it to 3 epochs is enough to fine-tune a pre-trained model like Mistral 7B. Mixed precision training consists of utilizing 16-bit floating-point (FP16) computations instead of the usual 32-bit format. This leads to a dramatic reduction in the amount of required memory and an increase in training speed without a significant decrease in accuracy.

2. Performance of the Chatbot

The chatbot's performance was evaluated using three key metrics: fallback rate, handoff rate, and containment rate. These metrics measure the system's ability to understand user inputs, manage conversations independently, and resolve queries without escalation. The evaluation was conducted by selected participants based on 65 recorded responses during the testing phase, as presented in Table 2.

Table 2

Performance of the Chatbot

Metrics	Results
Fallback Rate	4.6%
Handoff Rate	9.2%
Containment Rate	86.2%

The chatbot had a fallback rate of 4.6% which means that it was not hard to interpret user entries and this is a good sign of good natural language processing. Fallback rate is a diagnostic metric that indicates gaps in language processing and conversation design, with low fallback rates indicating higher levels of query interpretation (P. 2025).

It also noted that the handoff rate was 9.2 percent, indicating that not a significant share of interactions needed human intervention, which proves that the chatbot can maintain the majority of conversations independently.

Furthermore, the chatbot attained an 86.2% containment rate, meaning the majority of user queries were resolved without escalation. Containment rate refers

to the percentage of interactions handled without human intervention (Chudleigh, 2026), and enterprise chatbots typically range from 70% to 90% according to Botpress. Based on this benchmark, the chatbot falls within the high-performance category.

Overall, the results indicate effective, reliable, and autonomous chatbot performance, contributing to a positive user interaction experience.

3. System Specifications

The specifications of the current system are outlined through the system narrative, conceptual diagram, event specification, and flowchart. Each aspect was analyzed and discussed independently based on the insights of the thesis writers.

3.1 System Narrative

This section provides an in-depth overview of the suggested system and user-chatbot interaction. It aims to give a clear idea of how the system operates in solving current challenges. The ministry leaders face several challenges in accessing and working with the ministry manual because it is time-consuming and inconvenient to find specific information manually. The hard copies also restrict the flexibility and ease of access. To resolve such challenges, the suggested system, VineBot: An AI-Powered Chatbot for Ministry Manual Assistance, provides an intelligent and interactive solution. The chatbot is specifically trained with the Blessed Vineyard Ministry Manual so that it can answer the questions of users and give them the relevant information based on the content of the manual. Using the technique of transfer learning and natural language processing (NLP), VineBot

enables the ministry leaders to converse with the interface in a query-based mode so that the process of extracting information becomes easier and the workings of the ministry become more efficient.

Table 3

System Narrative

Process	Description
Ask a query to Vinebot.	Members of the ministry can utilize VineBot to ask questions or seek information regarding the Blessed Vineyard Ministry Manual through natural language.
Response Generation.	VineBot runs the user's inquiry through its specifically trained AI model and provides context-based answers that are directly taken from the Blessed Vineyard Ministry Manual. The chatbot delivers the answer in a simple and organized way through the chat interface displayed on the screen.
Admin Management Dashboard.	The administrator possesses the ability to control users, see feedback ratings, and handle the chatbot's user database. The main operators have complete rights to add, edit, or delete user accounts.

Table 3 presents the primary activities and corresponding descriptions of the proposed system, detailing its key processes. The system aims to make it easier for members of the ministry to access information from the manual through enabling them to question it in natural language. Vinebot provides context-based answers based on the Blessed Vineyard Ministry Manual, which is a more efficient and user-friendly way of accessing related information.

3.2 Conceptual Diagram

The conceptual diagram illustrates the proposed system's functioning through a sequence of steps starting from the user input and ending in the relevant response. It gives a brief overview of the system's operation, emphasizing query and response communication. Effectively, the diagram narrates the key interactions and functions that underlie the system's successful operation.

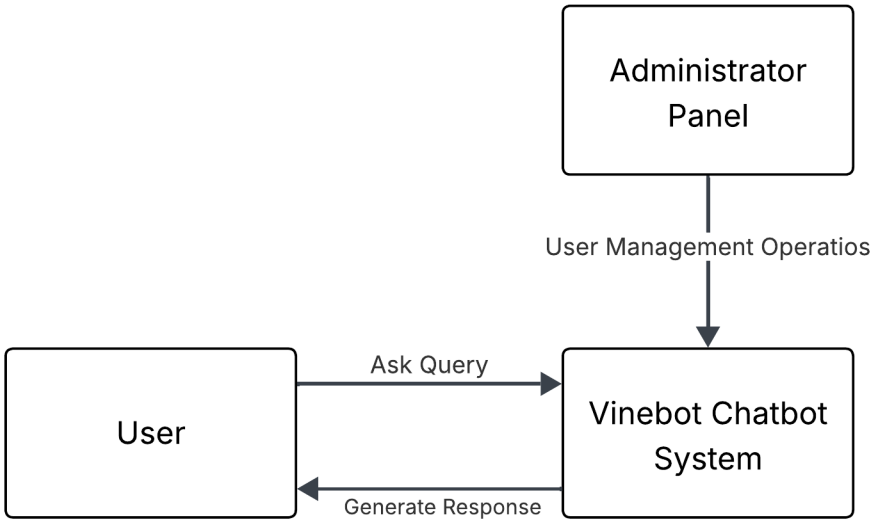


Figure 2 Conceptual Diagram

Figure 2 presents the concept diagram of the system. The diagram illustrates the relationship of the user, the chatbot system, and the administrator panel. Users are allowed to submit their questions to the system, which subsequently processes them and responds with relevant answers. On the other hand, the administrator panel has the role of controlling users' accounts. This relationship guarantees that the system works smoothly while still keeping user data properly organized and responding very well to users' inquiries.

3.3 Event Specification

This part of the study shows a list of events that shows the main tasks that the system will perform. It focuses on the main events and describes what happened during each event in the system's operation.

Table 4

Event List

Event Name	Description
Initiation	The system is made especially for questions related to the ministry manual, as suggested by the prompt message and sample questions that will appear.
User Query Input	The user types a Blessed Vineyard Ministry Manual-related query or statement. Using natural language processing (NLP), the chatbot analyzes the input and identifies relevant sections or content in the manual.
Response Generation	The trained Mistral model generates a response based on what is in the Ministry Manual dataset. The generated response is filtered to ensure that it is clear and relevant before showing the response to the user.
User Account Management	Through the dashboard, the administrator can add new users, change account details, activate or deactivate users, and delete accounts as necessary.

Table 4 presents the list of events that occur within the VineBot system. It points out the main interactions that help in effective and smooth communication, thus enabling ministry leaders to easily get relevant information from the Ministry Manual.

3.4 Flowchart

A flowchart is a diagrammatic representation of a procedure using various symbols that describe different steps involved in a process or sequence of events. These symbols are connected by arrows to identify the flow and direction of the process. Figure 3 below shows the step-by-step flow of how the system works.

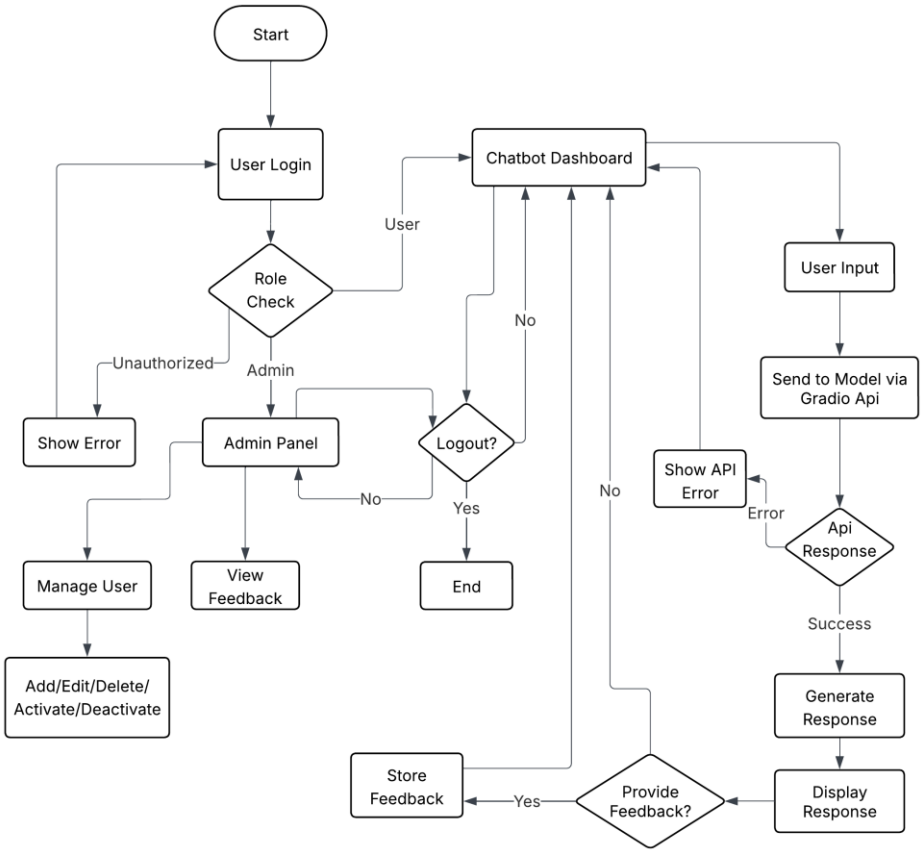


Figure 3 Flowchart

The flowchart shows the process by which the VineBot system works, starting with the user logging into the system using Google Authentication. The system then verifies the user role as admin or a normal user. Normal users are allowed to access the chatbot dashboard, where they input queries for the Ministry Manual. These questions are then processed and sent to the AI model via the Gradio API, which sends suitable replies based on the content of the manual. If an error involving an API or input is made, then a message stating an error is displayed; otherwise, the reply is displayed to the user, who can give their feedback, which is saved in the database. Meanwhile, admins have the privilege of accessing the Admin Panel to manage users—add, edit, delete, activate, or deactivate accounts—and also access user feedback for system development. This process ends when the user logs out; that is, the session gets closed, and this is how the VineBot system works from end to end.

4. System Design

This section presents a detailed overview of the architecture and user interface of the proposed system. It outlines the components of the structure, how they work together, and the design principles that served as a roadmap for the creation. The goal is to provide an effective and user-friendly experience by ensuring both functionality and usability.

4.1 System Architecture

The overall framework, behavior, and interactions between the system's fundamental components are defined by the conceptual design and structure

known as the system architecture. To guarantee reliable performance and efficient functionality, it gives a clear overview of how the system integrates frontend, backend, database, authentication, and AI-powered chatbot services.

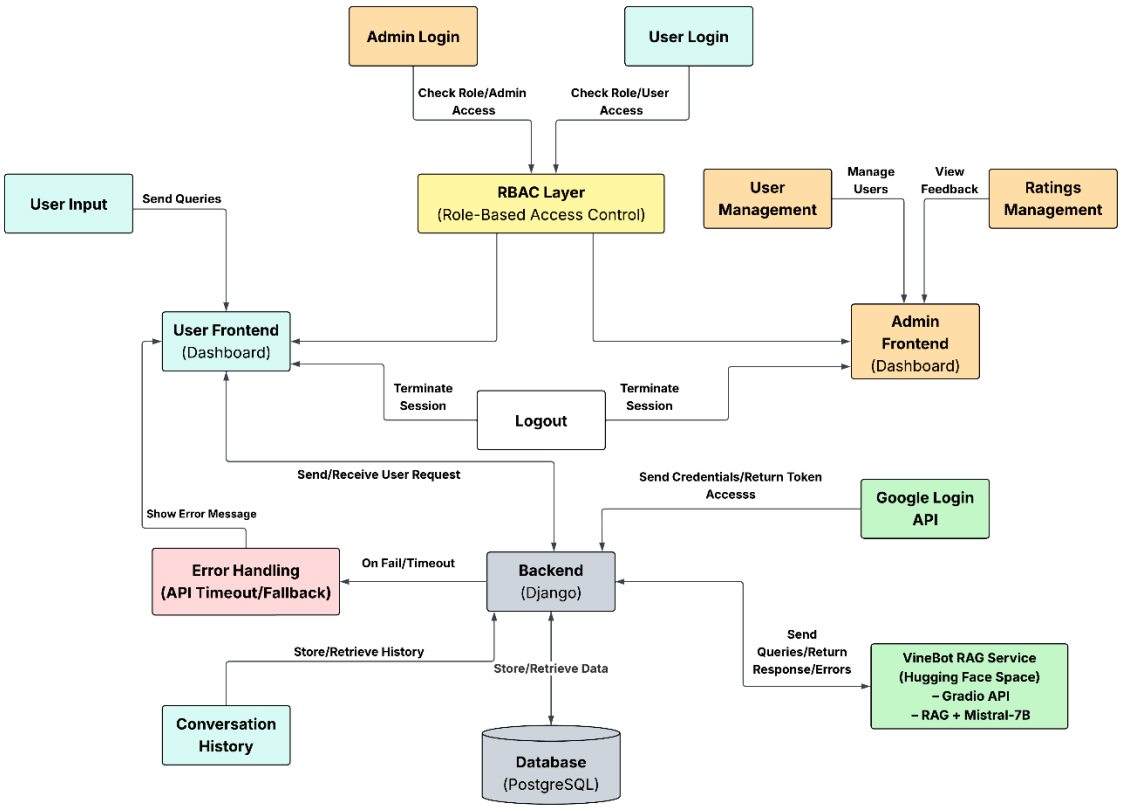


Figure 4 System Architecture

Figure 4 shows the system structure of VineBot: An AI-Powered Chatbot for Ministry Manual Assistance. It depicts how all components work together and make everything work seamlessly to relay data efficiently. The RBAC layer controls the Google Login API and routes users and admins to the appropriate dashboard. The Backend-Django handles user requests, relaying them to the Hugging Face Space, where execution of the RAG pipeline takes place. From there, the Gradio

API and fine-tuned model use the Ministry Manual to come up with responses. The PostgreSQL database stores user information, history of chats, and feedback. Admins manage users and keep an eye on the feedback via the Admin Frontend to ensure that the chatbot works reliably and effectively.

4.2 User Interface Design

This section explains the design of the proposed system, based on major components and structure. It then emphasizes that the user interface is a major point of access from which the user can interact with the chatbot through web-based input and responses. In addition, it provides an admin interface for user management and system monitoring. In all, this section sets out the guiding design principles and functionality at the core of the operation and usage of the system.

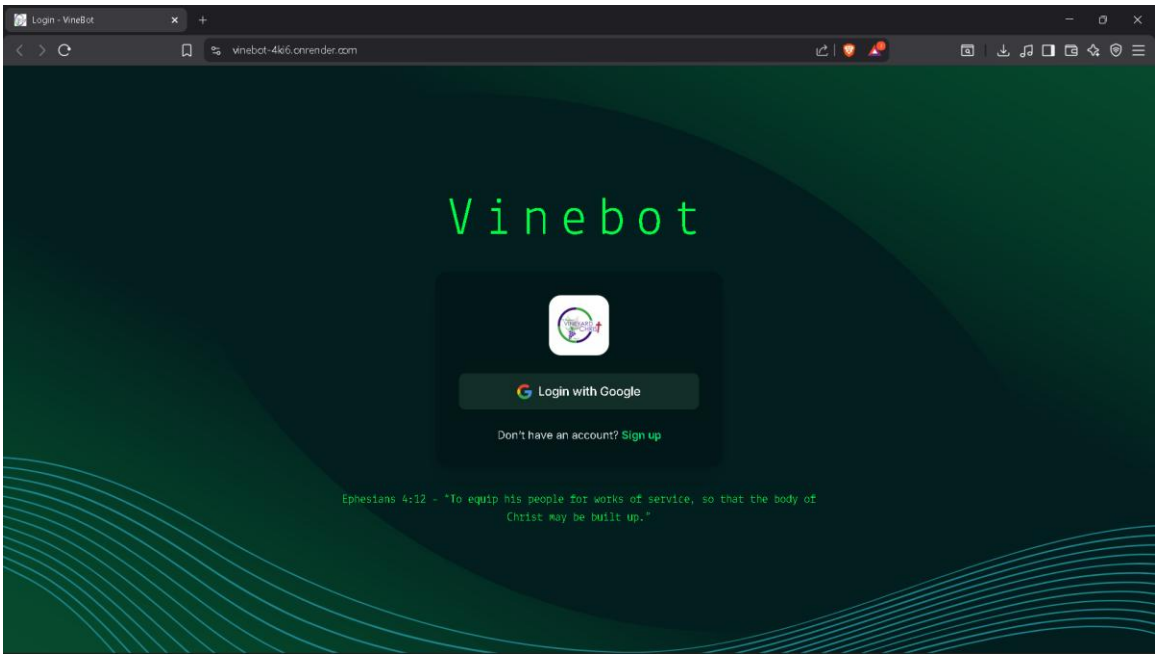


Figure 5 Vinebot Welcome Page

Figure 5 shows the Welcome Page, where you begin using VineBot. It provides users a clean, visually interesting introduction to the system that they can access from any web browser. The system name is in the middle of the page, and there is a Google Authentication login for secure access. There is also a link for new users to sign up. Its design features modern gradients and wave patterns representative of growth and connectedness, aside from an easy-to-navigate, professional layout. There is also a Bible verse from Ephesians 4:12 that shows the spiritual foundation and ministry-focused purpose.

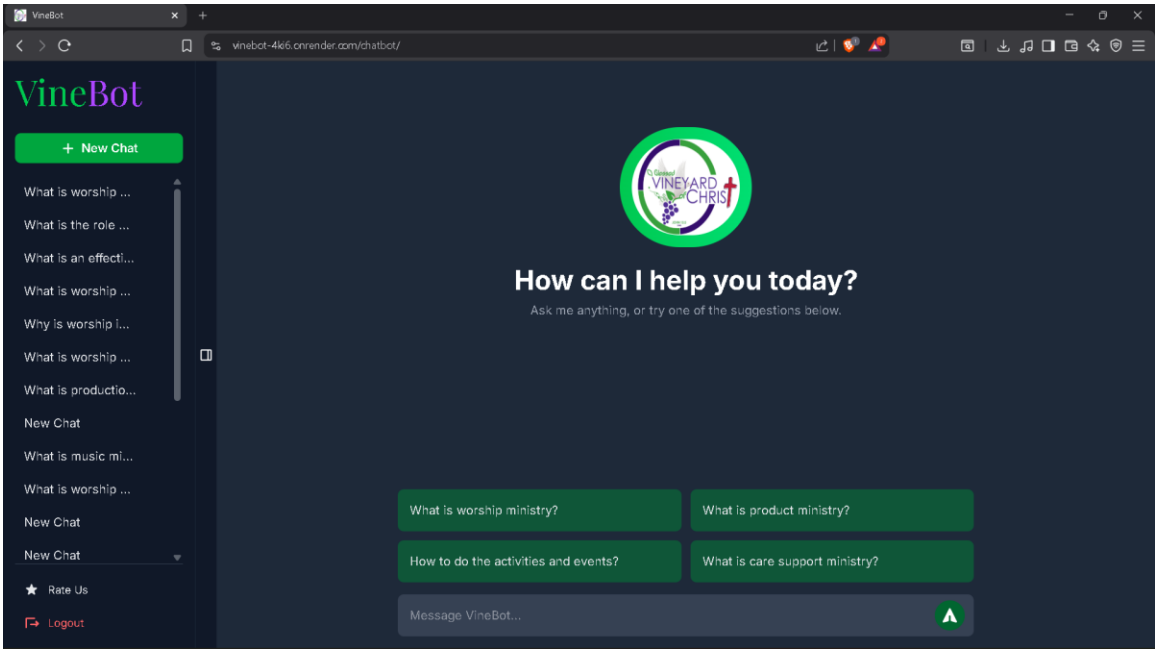


Figure 5.1 Chatbot Dashboard

Figure 5.1 presents the Chatbot Dashboard, which is the main interface of VineBot. This allows the user to communicate directly with the AI Chatbot. It displays a question for the user after logging on: "How can I help you today?" along with the suggested prompt so one can guide their queries. Users can view past

conversations, create a new chat, and access additional options like Rate Us and Logout from the left sidebar. Hovering over the title of each saved chat allows users to rename or delete it, bringing up a three-dot menu for these options. The interface is simple and modern, making it easier for users to focus, navigate, and enjoy a customized, well-structured chat experience.

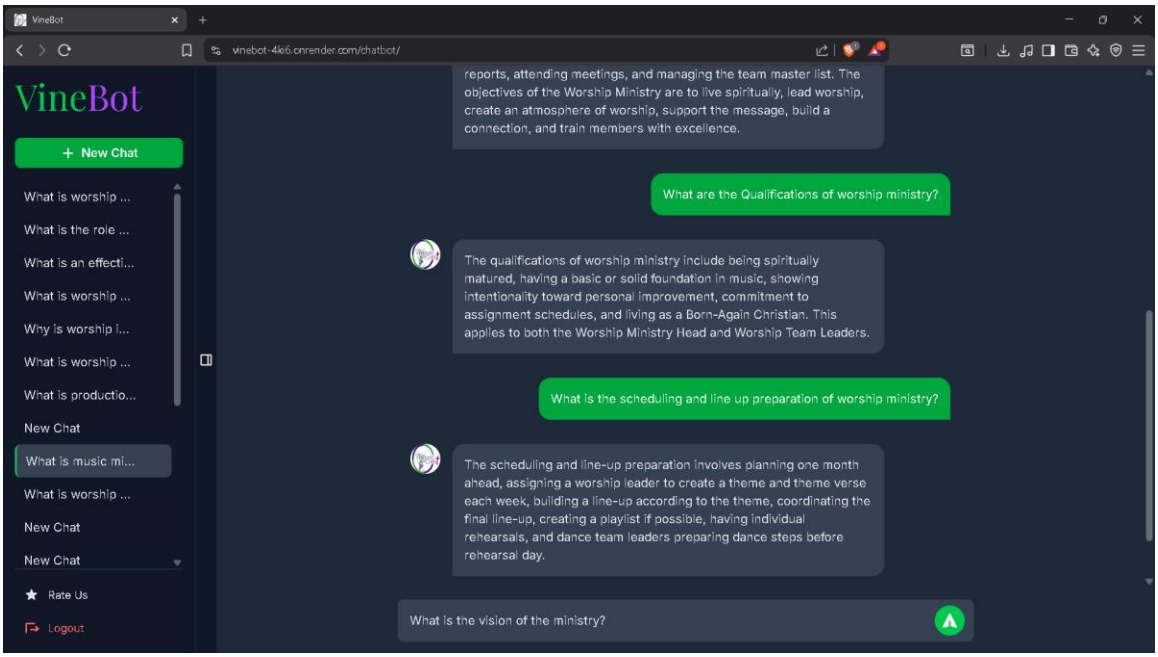


Figure 5.2 Sample Conversation of the Chatbot

Figure 5.2 shows a sample conversation between the user and the chatbot in VineBot. This interface from the system illustrates how the chatbot is able to respond in a structured and contextually appropriate manner based on user queries. In this interface, users can input any question they would want regarding the ministry manual, and the chatbot responds with the accurate information drawn from its knowledge base. Colors have been used with the chat messages to ensure legibility: green for the user's input and gray for that of the chatbot. This means

information like the visions of ministry, roles, and guides will be easily accessed by all leaders and members through an easy and friendly conversational interface.

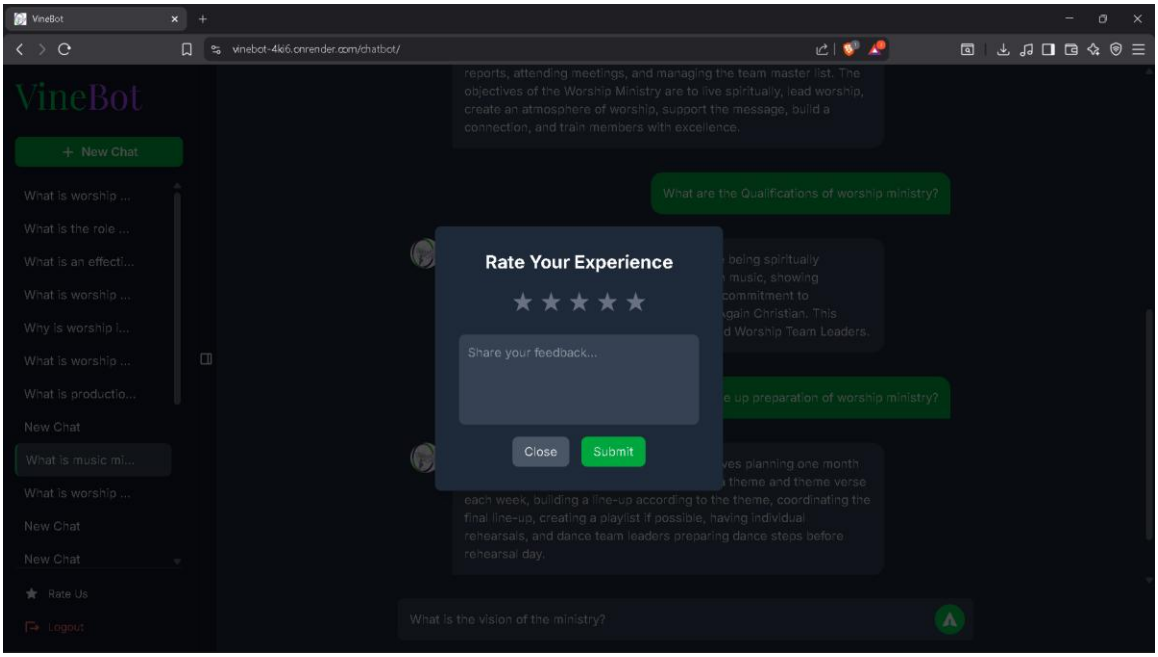


Figure 5.3 Rating Interface

Figure 5.3 shows the Rating Interface of VineBot, where users can rate their experience after interacting with the chatbot. This is accessible by selecting an option named "Rate Us" available in the sidebar. The user can select a star rating and write further comments in the provided text box if they wish to. This interface has two buttons: one for submitting the feedback and the other for closing the form. This will be helpful for getting valuable user insights regarding the performance, usability, and satisfaction of the system for future improvements and refinements of the interaction design of the chatbot.

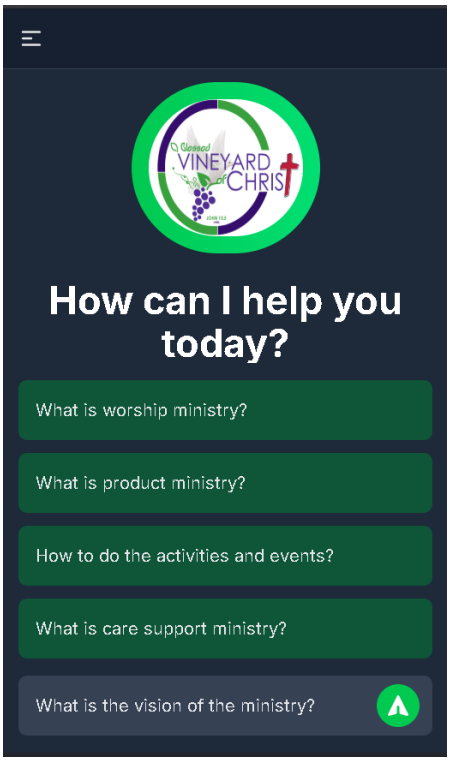


Figure 5.4 Interface Design for Mobile Devices

Figure 5.4: VineBot's mobile layout works better on small screens, keeping it simple to use. The setup holds essential bits like the logo, a welcome note, or quick-tap prompts to kick off tasks. Up top, a fold-out menu helps you move around fast. Built to adapt, this version runs smooth no matter the device.

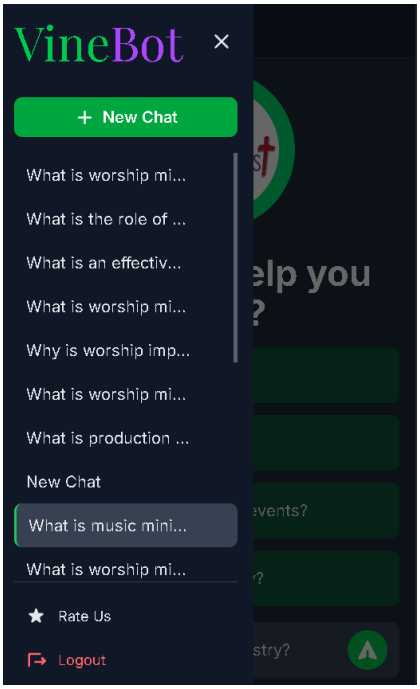


Figure 5.5 Menu Button Interface Design for Mobile Devices

Figure 5.5 displays VineBot's mobile side panel, offering quick ways to move around. When you tap the menu button, it opens up smoothly, revealing links like Start Fresh Chat, Past Chats, Give Feedback, or Sign Out. Besides that, the design stays neat and touch-friendly, helping people handle messages without hassle - even on compact devices.

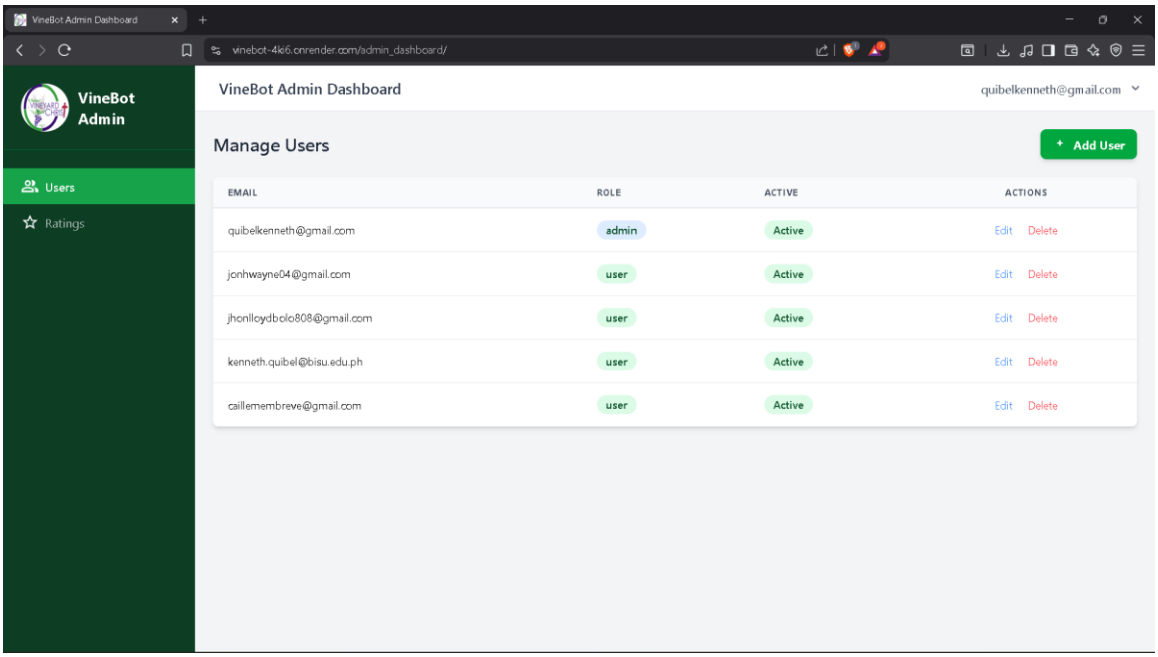


Figure 5.6 Vinebot Admin Dashboard

Figure 5.6 shows the VineBot Admin Dashboard - a space where admins manage people and tasks. It lets you view user profiles, check their roles or current status, while offering tools like edit or remove user. To bring in new user fast, there’s a clear add-user button placed handy. With clean layout choices, it stays uncluttered yet functional for quick oversight.

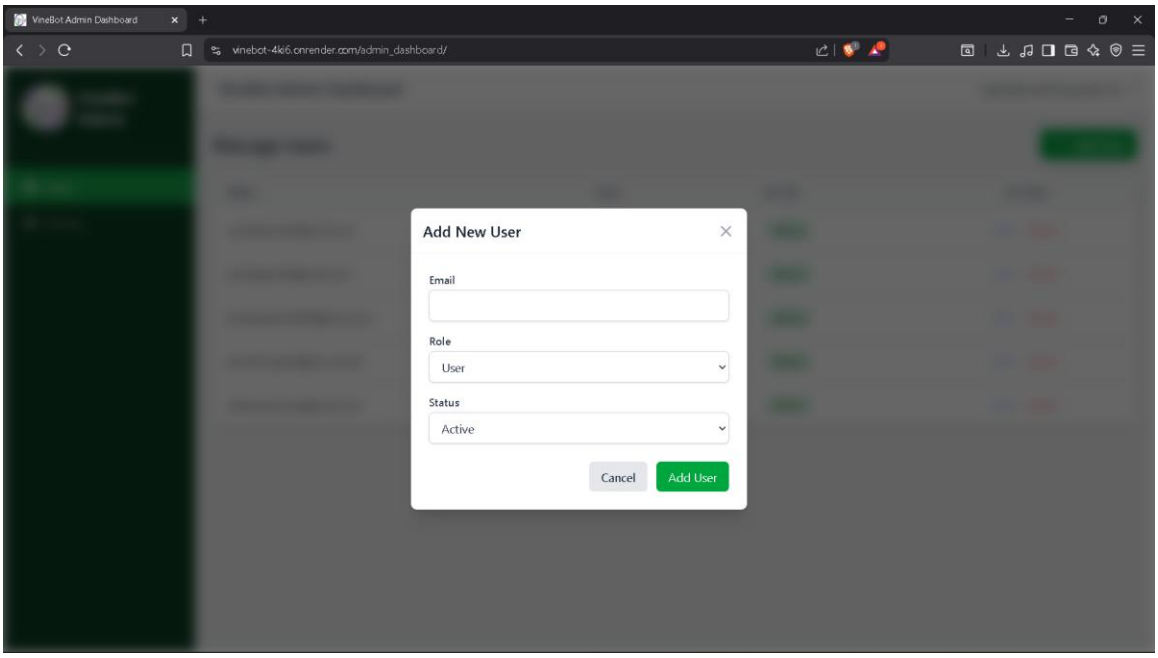


Figure 5.7 Add User

Figure 5.7 shows the Add User screen inside the Admin Dashboard. The admin enters an email, picks a role, also sets the account’s current status. To move forward, they click confirm - though there's an option to back out if needed. These controls help manage users without confusion or errors.

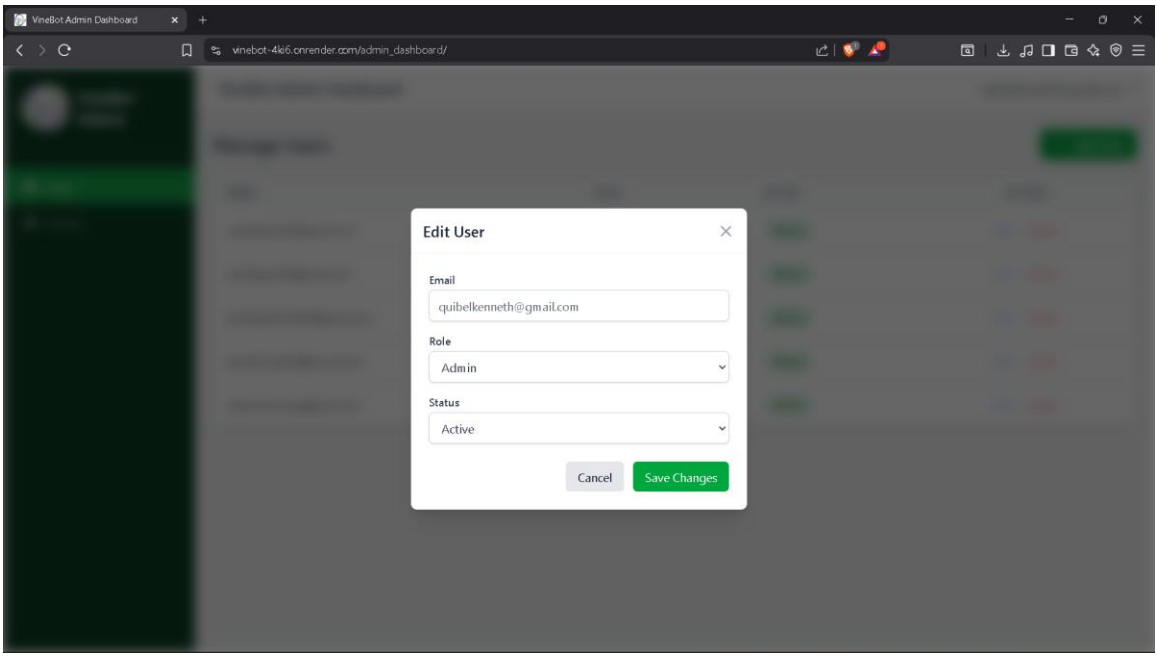


Figure 5.8 Edit User

Figure 5.8 shows the Edit User screen inside the Admin Dashboard. When admins need to change a person’s info - say their email, job type, or active status - they use this. You can hit save after editing, or just back out if you changed your mind. That way, only approved updates go through.

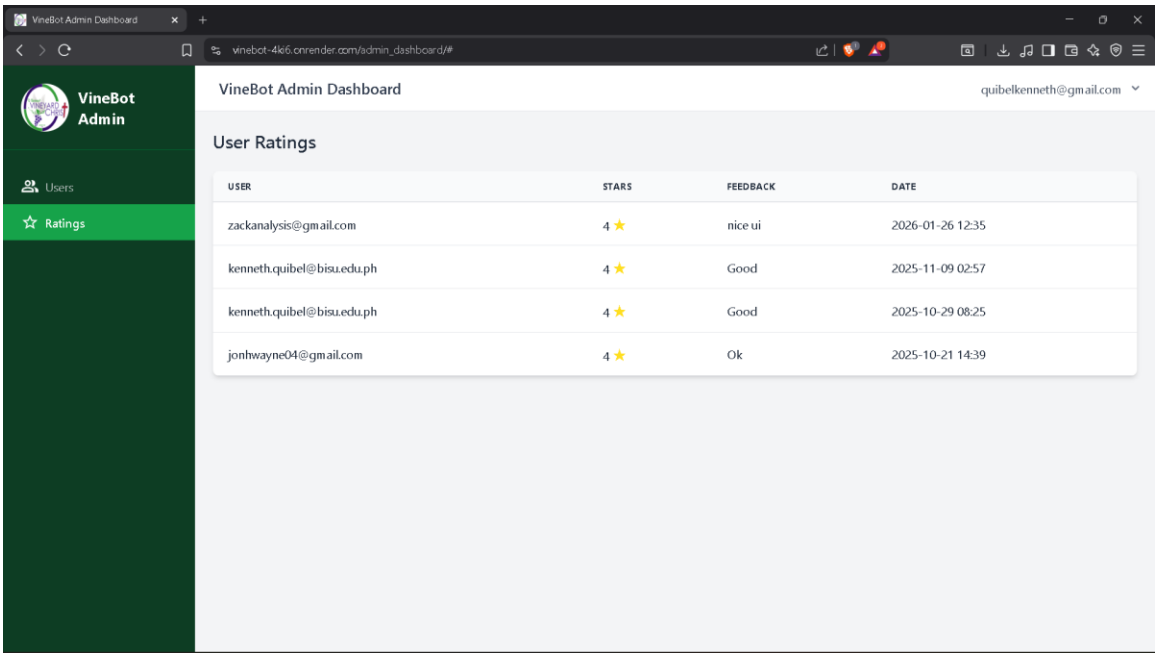


Figure 5.9 User Rating

Figure 5.9 gives a look at the Admin Dashboard's User Ratings area - this is where admins check what users have said. You'll see the person's email, their star score, comments they wrote, plus when it was sent, so teams can track how things are working or find ways to upgrade the setup.

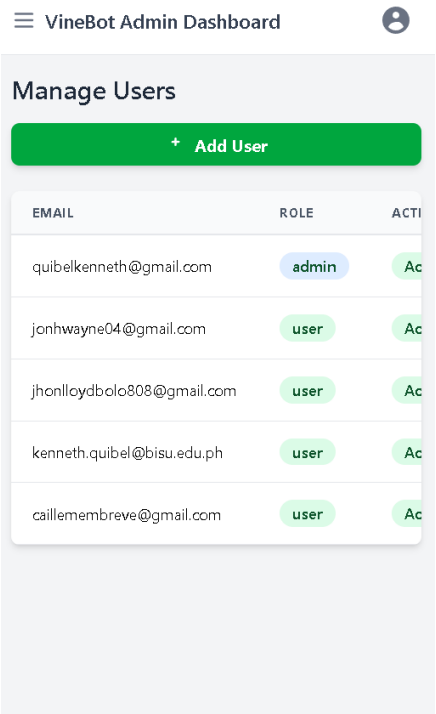


Figure 5.10 Admin Dashboard for Mobile Devices

Figure 5.10 displays the VineBot admin dashboard on a phone. Though scaled down, it still includes everything needed. Key tools like managing users, setting roles, or checking activity stay fully functional. The layout adjusts smoothly, so actions - adding someone, changing info, deleting accounts - work just fine on smaller screens. Even when space is tight, buttons and menus remain clear and easy to reach. Navigation feels familiar, matching the desktop look closely enough to avoid confusion while moving between gadgets.

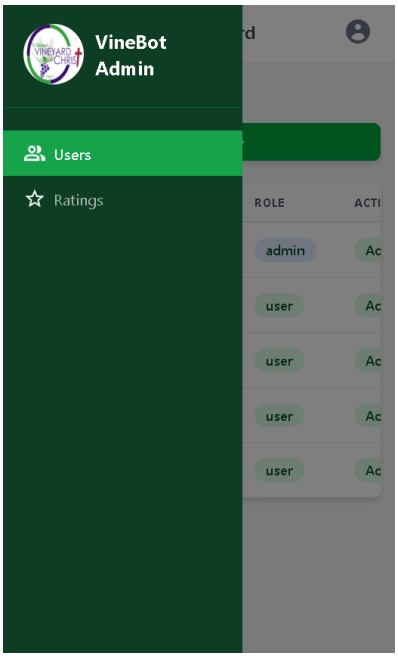


Figure 5.11 Admin Dashboard Mobile Side Panel

Figure 5.11 shows the mobile menu in VineBot's admin area - built to work well on small devices. Instead of clutter, it uses a tight layout so admins jump fast to key areas, such as User lists or Feedback tabs. Even when shrunk, you still see the VineBot badge and name, keeping things recognizable. A colored marker points out which section you're viewing right now. Since this slide-out panel adapts easily, moving around feels natural, just like on bigger screens.

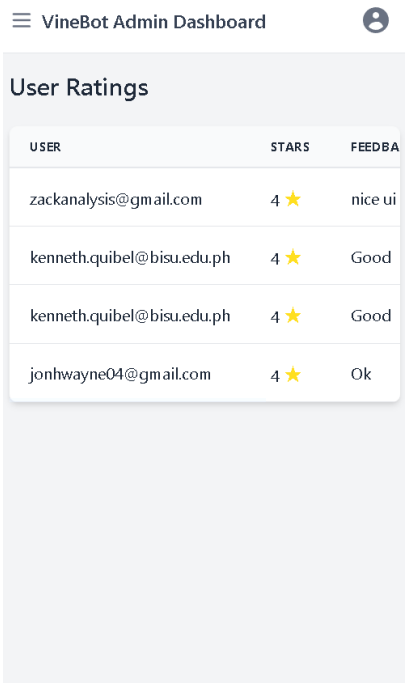


Figure 5.12 User Rating for Mobile Devices

Figure 5.12 shows the VineBot admin dashboard – user ratings page, mobile view. This screen gives a quick look at what users think, using neat cards made for smaller screens. You'll see each person's email alongside their stars plus written comment. Info pops out clearly, letting admins check reviews without hassle.

5. Customer Satisfaction Rating

The Customer Satisfaction Score (CSAT) was utilized to evaluate how effectively the chatbot met user expectations and delivered a meaningful conversational experience. The number of church leaders that were involved in the assessment at Blessed Vineyard Church was thirteen (13). The reason behind the choice of these participants is that they are directly engaged with the operations of

the ministry and knowledgeable with the formal Blessed Vineyard Church Ministry Manual, the main source of knowledge of the chatbot. Upon using the system, each church leader would be given a Chatbot Evaluation Form.

During the evaluation process, the participants were instructed to ask five (5) questions derived from the Blessed Vineyard Church Ministry Manual to ensure that the chatbot was assessed using actual ministry-related content. The validity of the evaluation in terms of content was in the fact that the questions were based on the official ministry manual, which directly covered the desired area of knowledge and practical implementation of the system in the church environment.

To measure overall user satisfaction, a standardized Customer Satisfaction (CSAT) single-item measure was employed. The respondents were requested to evaluate their general experience with the chatbot system using a five-point Likert-type scale with the responses such as 1 (Very Dissatisfied) to 5 (Very Satisfied). CSA approach is simple, familiar, and easy to interpret in the determination of perceived satisfaction and is common in system evaluation and user experience research (Bitca, 2024). The results obtained after the interview with the thirteen church leaders were calculated through the mean in order to get the total satisfaction score.

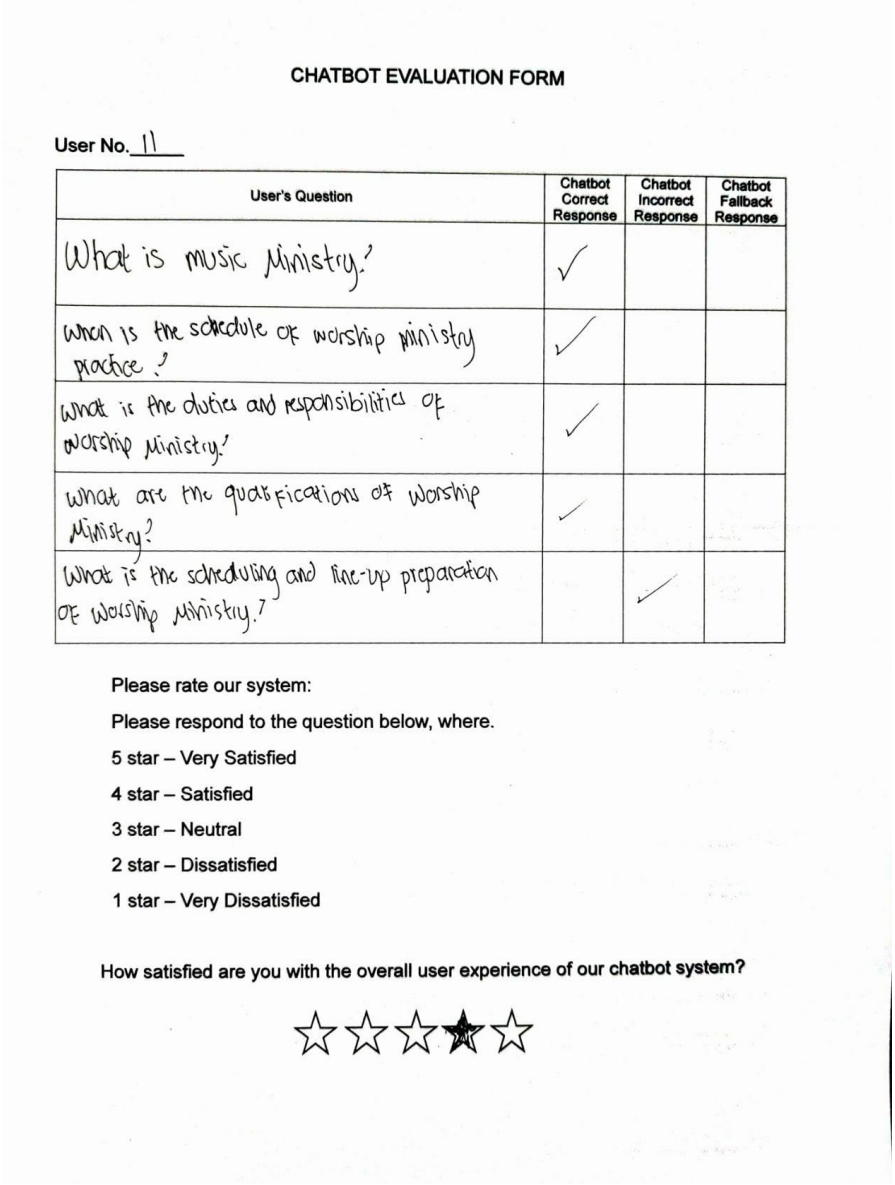
Table 5

Summary of Customer Satisfaction Rating

Category	Result
Customer Satisfaction Rating	4.5 stars
Total Respondents	13 Church leaders

As presented in Table 5, the chatbot achieved an average CSAT score of 4.5 out of 5.0. According to Bitca (2024), ratings within the range of 4 to 5 on a five-point scale generally indicate high customer satisfaction, reflecting a positive overall experience with minimal areas for improvement. The score received is thus an indication that the church leaders were quite satisfied with the chatbot, responsive and simple to engage with in the assessment process.

The high satisfaction rating indicates that the chatbot was able to provide clear, relevant, and accurate responses to ministry-related queries. The answers of the thirteen (13) church leaders gave good revelations on the usability and effectiveness of the system in aiding church operations. Although the findings reveal a high level of approval, the results also show the relevance of refining the system continuously in order to improve the user experience even more. To maintain the reliability and the further enhancement of the chatbot system, it is suggested to monitor satisfaction ratings on the regular basis.



CHATBOT EVALUATION FORM

User No. 11

User's Question	Chatbot Correct Response	Chatbot Incorrect Response	Chatbot Fallback Response
What is music Ministry?	✓		
When is the schedule of worship ministry practice?	✓		
What is the duties and responsibilities of worship Ministry?	✓		
What are the qualifications of worship Ministry?	✓		
What is the scheduling and line-up preparation of worship Ministry?		✓	

Please rate our system:

Please respond to the question below, where.

5 star – Very Satisfied

4 star – Satisfied

3 star – Neutral

2 star – Dissatisfied

1 star – Very Dissatisfied

How satisfied are you with the overall user experience of our chatbot system?

☆☆☆★☆

Figure 6 Chatbot Evaluation Form

Figure 6 shows an example of the assessment form that the thesis writers designed to have the chatbot's performance manually evaluated. This is the same assessment form distributed to purposively selected church leaders, who would be able to use it to make expert judgments about the overall effectiveness of the system.

Chapter 3

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter includes the summary of findings, conclusions, and recommendations that were discussed based on the data presented in the previous chapter. The objective of the study was to develop VineBot, an AI-powered chatbot designed to help the leaders and members of Blessed Vineyard Ministry–Sagbayan, Bohol, access the information they need from the ministry manual. This system addressed the problem of performing a manual search within a huge repository and enhance the effectiveness of operations within the ministry using an easy, interactive chatbot for information access.

Specifically, this chapter focused on the design of the Blessed Vineyard Ministry Manual Chatbot, supported by generative AI. The need for the chatbot came to light from a series of feedbacks where the manual processes were very cumbersome, time-consuming, and inefficient. The chapter addressed the following key questions: (1) What is the architecture of the Mistral 7B model? (2) What is the performance of the chatbot in terms of the following metrics: Fallback Rate, Handoff Rate, and Containment Rate? (3) What is the specification of the system in terms of System Narrative, Conceptual Diagram, Event Specifications, and Flowchart? (4) What is the design of the proposed system in terms of System Architecture and User Interface Design? (5) What is the chatbot’s customer satisfaction score?

This study introduced a web-based user interface that easily allowed ministry leaders to engage a chatbot about the ministry manual. The chatbot guided the users efficiently to where they needed to find the information.

After conducting a thorough analysis of the data, the thesis writers discovered the following information.

1. The Vinebot was built upon the Mistral 7B model, which was a strong and efficient backbone to handle the special requirements of the Blessed Vineyard Ministry manual for natural language processing. The model processes input through RoPE to include positional information in the input, utilizing a context length of 8,192 tokens to control long ministry documents. It contains 32 transformer layers with many advanced features, including Sliding Window Attention, RMSNorm for stability, and SwiGLU for better expressiveness. To optimize performance and scalability further, it integrates state-of-the-art technologies such as FlashAttention 2, speeding up attention mechanisms; xFormers, reducing memory footprint; and rolling buffer cache.
2. The chatbot performs well, achieving an 86.2% Containment Rate, reflecting its high level of accuracy in self-resolving user queries regarding the ministry manual. It had a very low Fallback Rate of 4.6% and a Handoff Rate of 9.2%, demonstrating very strong intent recognition and reliability.
3. Manual navigation through the documents of the Blessed Vineyard Ministry was inefficient and physically limiting; there was a need for an accessible digital alternative. VineBot simplified this process by utilizing advanced

natural language processing and transfer learning in order to gain immediate, query-based information access directly from the manual of the ministry. Therefore, the system embeded a structured workflow that goes all the way from secure Google Authentication to AI-driven response generation via the Gradio API, without latency associated with manual searching, and offers a set of powerful management tools to administrators. This change served to help not only enhance the accuracy and accessibility of the guidelines of the ministry but also to empower its leaders with a useable tool that dramatically enhances administrative efficiency and operational decision-making.

4. The proposed system design incorporated a Django-based backend with a robust RBAC mechanism to securely and seamlessly interact across user and administrative dashboards. This architecture leveraged a pre-set Retrieval-Augmented Generation pipeline hosted on Hugging Face and accessed via the Gradio API, hence guaranteeing fast query processing of the ministry manuals. Complemented with a PostgreSQL database for reliable data management, the user interface is designed to be simple and intuitive, providing ministry leaders with a professional, accessible, and highly functional platform from which they can retrieve information.
5. The results were outstanding, as the average for customer satisfaction was a 4.5-star rating, reflecting that the vast majority of the 13 respondents described themselves as very satisfied with VineBot's performance.

Conclusion

The study concluded that the Vinebot, an AI-powered chatbot for ministry manual assistance, which is based on the Mistral 7B model and optimized with ministry-specific information, is effective to deliver the accessible and accurate ministry information to its leaders and members. Its systematic system design allowed retrieval of information and interaction between users to work efficiently. The outcome of performance evaluation showed that the system is reliable with respect to operational efficiency and user satisfaction, but it can be used to address more complex queries to make the system more valuable. All in all, the chatbot is a viable and efficient way to enhance the church administrative support and decision-making processes, as it is scalable.

Recommendations

The thesis writers made some suggestions based on their exploration and interpretation of the data, which are listed below:

1. The thesis writers suggest to explore more recent and improved language models like LLaMA 3, Gemma 2, or GPT-4 Mini. These offer better comprehension, efficiency, and scalability that will definitely enhance VineBot further in producing responses that are more contextually appropriate and correct.
2. The capability development in the use of conversational memory was strongly advised by the thesis writers. This will improve the ability of VineBot

so that any previously stated information would be remembered. It would thus create smooth conversations with a human-like effect.

3. The thesis writers suggest adding a citation feature in the chatbot's responses, referencing specific pages or parts of the Blessed Vineyard Ministry Manual. This would ensure that the providing of information pertaining to ministries is correct, transparent, and accountable.
4. The thesis writers recommend developing the training dataset further by paraphrasing, replacing synonyms, and restructuring sentences based on data augmentation techniques. It would increase the diversity in the language within the model and decrease redundancy while yielding responses that are more accurate and coherent.
5. The thesis writers may suggest enhancement in the administrative dashboard to include more management tools, like the tracking of chatbot activities and conversation logs.
6. The Voice-Activated Interface for Accessibility feature is proposed by the thesis writers. Realizing that some of the leaders in the ministry may be elderly or not so comfortable with technologies, the speech-to-text and text-to-speech (STT/TTS) capabilities should be integrated into later versions.

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APPENDICES

A. Transmittal Letters

Republic of the Philippines
BOHOL ISLAND STATE UNIVERSITY
Poblacion Norte, Clarin, 6330, Bohol, Philippines
Office of the Instructions
Balance | Integrity | Stewardship | Uprightness

March 11, 2025

MS. MENCHIE A. LABRIGAS
Instructor II
Bohol Island State University
Poblacion Norte, Clarin, Bohol

Madam:

Good day!

We, third-year students of Bohol Island State University, Clarin Campus pursuing a Bachelor of Science in Computer Science, are currently working on our thesis entitled **"VINEBOT: AN AI-POWERED CHATBOT FOR MINISTRY MANUAL".**

In connection with this, we humbly ask for your service and expertise to be our Editor. We do believe that your knowledge and insights will greatly help us enrich our paper.

Your favorable response is highly appreciated.

Thank you and God Bless!

Respectfully yours,

KENNETH S. QUIBEL
JHON LLOYD L. BOLO
CAILLE T. MEMBREVE
GIESYL M. NAVACILLA

Noted:

ALME B. MARAVILLAS, DIT
Instructor, Method of Research

Approved:

MS. MENCHIE A. LABRIGAS
Thesis Editor

Republic of the Philippines
BOHOL ISLAND STATE UNIVERSITY
Poblacion Norte, Clarin, 6330, Bohol, Philippines
Office of the Instructions
Balance | Integrity | Stewardship | Uprightness

APPROVAL OF PROPOSED THESIS/DISSERTATION TITLES

Date: 03-05-2025

The Chairman
Thesis Committee
College of Science and Management
This Campus

Sir/Madam:

The undersigned, a 3rd year BSCS student from BISU-CLARIN has the honor to submit for approval any of the following proposed titles for his/her thesis/dissertation. Attached herewith is a concept paper for each title.

	Proposed Titles	Variables/Concept	Name/Signature of Professor *(affix on chosen Title)*
1	VineBot: An AI-Powered Chatbot for Ministry Manual Assistance		ARIEL CHRISTIAN C. VIODOR, DIT
2	Smart Mushroom Detection: A YOLOv12-Based Approach for Edible and Poisonous Detection		ARIEL CHRISTIAN C. VIODOR, DIT
3	Cacao Bean Quality Grading Using YOLOv12		ARIEL CHRISTIAN C. VIODOR, DIT

Thank you for your assistance on this matter.

Very truly yours,

KENNETH S. QUIBEL
Thesis Leader

Respectfully returned to _____ *certifying the approval of the topic number* _____ *with the following Thesis Committee:*

Adviser : DR. ARIEL CHRISTIAN C. VIODOR
Statistician : _____
Editor : _____
Internal Expert : _____

A research design is submitted for proposal using the institutional format.

MARICHU C. LIBRES, PhD
Dean, CSM

Republic of the Philippines
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Poblacion Norte, Clarin, 6330, Bohol, Philippines
Office of the Instruction
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APPOINTMENT OF THESIS / DISSERTATION ADVISER

March 11, 2025

DR. ARIEL CHRISTIAN C. VIODOR
Assistant Professor I

This College

I have the honor to appoint you as adviser of Kenneth S. Quibel, Jhon Lloyd L. Bolo, Caille I. Membreve, Giesyl M. Navacilla, candidate for the program Bachelor of Science in Computer Science who proposes to write a thesis/dissertation on VineBot: An AI-Powered Chatbot for Ministry Manual Assistance. The candidate had been instructed to have preliminary consultation with you about the study, his/her academic background and preparation to write the thesis/dissertation, the materials available that may be needed in the research, etc.

Accordingly, you will please see that the candidate follows all necessary procedures to ensure successful research work. Under existing regulations, you may agree with the candidate for your regular consultation/conference.

Kindly coordinate every month with the undersigned on the progress made by the candidate and his/her ability to carry independent research work. If, in your opinion, the candidate is having difficulty to carry out his/her research work, please provide guidance to him/ her as soon as possible or you may refer to the other committee members for further assistance.

REY ANTHONY G. GODMALIN, DIT
Program Chairperson

Republic of the Philippines
BOHOL ISLAND STATE UNIVERSITY
Poblacion Norte, Clarin, 6330, Bohol, Philippines
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APPOINTMENT OF RESEARCH COMMITTEE / EXAMINING TRIBUNAL

April 23, 2025

TO : Dr. Marietta C. Macalolot -Chairman
Dr. Marichu C. Libres -Member
Dr. Ramil S. Bulilan -Member
Dr. Rey Anthony G. Godmalin -Member
Dr. Alme M. Aparicio -Internal Expert
Dr. Ariel Christian C. Viodor -Thesis Adviser
Dr. Ms. Menchie A. Labrigas -Thesis Editor

Candidate : Kenneth S. Quibel
Jhon Lloyd L. Bolo
Caille I. Membreve
Giesyl M. Navacilla

Program : Bachelor of Science in Computer Science

It is my pleasure to appoint you to the Research Committee/Examining Tribunal of the aforementioned candidate. I am sending you copy of the thesis/dissertation entitled: **VINEBOT: An AI-Powered Chatbot for Ministry Manual Assistance** submitted by this candidate. Kindly examine it thoroughly for the **Proposal Hearing**/Oral Defense/Public Defense which will take place at the Bohol Island State University, Clarin Campus, Clarin, Bohol, BSCS Com Lab 2 on April 28, 2025, at 8:30 - 9:30 in the morning.

If you find fundamental deficiencies in the thesis/dissertation that warrant postponement of the **Proposal Hearing**/Oral Defense/Public Defense, please let the undersigned know. The other members of the Committee/Tribunal will then be notified to get a consensus.

Thank you very much.

REY ANTHONY G. GODMALIN, DIT
Program Chairperson

Republic of the Philippines
BOHOL ISLAND STATE UNIVERSITY
Poblacion Norte, Clarin , 6330, Bohol, Philippines
Office of the Instructions
Balance | Integrity | Stewardship | Uprightness

April 23, 2025

JYBB I. JOSOL
Host Pastor
A Blessed Vineyard of Christ International Ministry-Bohol Outreach
Hillside, Sagbayan, Bohol

Dear Mr. Josol:

Good day!

We, the third-year students pursuing Bachelor of Science in Computer Science at Bohol Island State University - Clarin Campus, are conducting our research study titled 'VINEBOT: An AI-Powered Chatbot for Ministry Manual Assistance. As part of this research, we would like to kindly request permission to include your ministry manual in our study. The content of your manual will serve as a vital reference in building our AI chatbot, which is designed to help church leaders and members quickly access ministry-related information and guidelines in a more user-friendly and accessible way. We believe that incorporating real and meaningful resources like yours will make the system more relevant, helpful, and impactful for the church community. Rest assured that the information gathered will only be used for academic purposes and will be handled with the utmost care and confidentiality.

Your support would greatly contribute to the success of our research, and we truly appreciate your participation. If you have any questions or would like more information, please feel free to contact us through this mobile number 0966-694-0813. We would be happy to discuss it further at your convenience.

Thank you so much for considering our request.

Respectfully yours,

KENNETH S. QUIBEL
Thesis Leader

Noted:

ARIEL CHRISTIAN C. VIODOR, DIT
Thesis adviser

Recommending Approval:

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