St. Vincent de Ferrer College of Camarin Inc.

INSTITUTE OF INFORMATION TECHNOLOGY AND COMPUTER STUDIES

Transforming Student Health Services: Designed and Implementation of an Innovative Web and Mobile-Based Clinic Appointment System for St. Vincent de Ferrer of Camarin, Inc.

A Capstone Project

Presented to the Faculty of the

Institute Of Information Technology and Computer Studies

Baccalaureate Programs

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November, 2024

St. Vincent de Ferrer College of Camarin Inc.

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APPROVAL SHEET

The research project entitled "**Transforming Student Health Services: Designed and Implementation of an Innovative Web and Mobile-Based Clinic Appointment System for St. Vincent de Ferrer of Camarin, Inc.**", prepared and submitted by Aligan, Rhed N., Buenafe, Danilo Jr., Coniaro, Joanna Mae M., Coronel, Cristina A.and Paz, Emmanuel Ray ,in partial fulfillment of the requirements for the degree **BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY**, is hereby approved and accepted.

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Acknowledgement

First of all, the researchers would like to thank the **Almighty GOD**, for His enduring grace, guidance, and protection that He has bestowed upon us during this research project.

The researchers would also like to express their sincerest gratitude to their Course Professor, **Mr. Percival Adao**, for his patience, motivation, and extensive knowledge. His guidance helped them throughout their research and writing of their thesis.

To their parents, who have continuously supported them financially to accomplish this study and for their guidance, encouragement, and inspiration to them throughout their lives, a very special thank you for your parental presence and constant guidance to them.

They would also like to thank the school clinic administrators, especially **Ms. Imelda V. Castillo**, for granting us permission to gather relevant data for our thesis.

Lastly, they would also like to thank each other for the stimulating discussions and brainstorming, for all the sleepless nights they were working together for deadlines, and for all the fun they have had for the past months.

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Abstract

The healthcare services have been evolving throughout the years, with the innovation used by technology integrating it into routine medical practices has become an imperative in terms of enhancing the accessibility and efficiency. The demand for efficient and timely healthcare services are growing big, reasons why educational institutions are seeking innovative solutions for the increasing demand of the students' needs in their population. Recognizing the streamlined necessity and user-friendly approach for the students' accessibility, St. Vincent de Ferrer College of Camarin, Inc. embraced this challenge by creating a "Virtual Assistant-Enabled CliniQuick Aid" for effortless access in terms of taking appointments. This innovative solution addresses the common problems/challenges in booking an appointment, such as time-consuming process and accessibility issues, by providing a seamless interface that can be accessed on multiple devices. The intuitive design of the system ensures that the students would be able to quickly and easily secure clinic appointments, thereby improving the students' access to healthcare services. The implementation of CliniQuick Aid demonstrates the potential of Virtual Assistant (VA) in transforming the healthcare deliveries and educational institutions, not only in clinic enhancement and efficiency in operations. By exploring the development, deployment, and CliniQuick Aid impact, this study aims to highlight its roles into a more efficient and student-centered healthcare environment in St. Vincent de Ferrer College of Camarin, Inc. The study further implies broader implications on integrating Artificial Intelligence (AI) and Virtual Assistant (VA) technology into the healthcare system, paving the way for future advancement.

St. Vincent de Ferrer College of Camarin Inc.

INSTITUTE OF INFORMATION TECHNOLOGY AND COMPUTER STUDIES

Table Of Contents

CHAPTER II: Review of Related Literature

CHAPTER III: Research Design and Methodology

List of Figures

Figure 7: Virtual Assistant-Enabled CliniQuick Aid System Design……...….

Definition of Terms

The following are the terms used by the researchers in the study to have common understanding with the readers.

Artificial Intelligence. It refers to the ability of the chat system to reply automatically and simultaneously for faster and better transactions. Also known as chatbot.

Clinic Appointment. This term refers to the consultation date and time which is selected and confirmed using the system.

CliniQuick Aid. It refers to the system which features one-click appointments.

Real-Time Smart Calendar. This refers to the capability of the system calendar to send reminders, give recommendations, real-time update, secure data handling, feedback and ratings, and remote connection with healthcare workers, which supports different platforms.

St. Vincent de Ferrer of Camarin, Inc. This refers to the place or school where the research and survey was conducted. It is also the beneficiary of the research and its produced system.

User Experience (UX). It refers to how easy the user navigates or uses the system

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Chapter I

Introduction and Its Background

In today's fast-paced world, scheduling medical appointments can be a heavy task, often requiring multiple phone calls, long wait times, and potential scheduling conflicts. For students balancing academic responsibilities and extracurricular activities, finding time to visit the clinic for medical consultations or check-ups can be challenging. Additionally, the study on missed patient appointments in pediatric clinics sheds light on factors influencing appointment attendance, which can inform strategies to increase attendance.

St. Vincent de Ferrer of Camarin, Inc., commonly referred to as Vincentians, is an educational institution committed to providing quality education and holistic development for its students in Camarin, North Caloocan. In keeping with its mission to promote students' overall health, the university acknowledges the significance of easily accessible medical care.

Traditional methods of scheduling clinic appointments often involve long wait times, manual paperwork, and potential communication barriers between students and clinic staff. These inefficiencies can lead to delays in accessing healthcare services, impacting student well-being and academic performance.

In view of this, CliniQuick Aid seeks to streamline the appointment scheduling process by providing an effortless one-click solution. Through the system, SVFC students can easily book clinic appointments with just a few taps on their devices, eliminating the need for lengthy phone calls or in-person visits to the clinic reception. In doing so, CliniQuick Aid embodies St. Vincent de Ferrer of Camarin, Inc.’s unwavering commitment to fostering student welfare through innovative and accessible healthcare solutions.

By integrating virtual assistant technology into the appointment scheduling process, students can access the clinic's services more conveniently, leading to improved health outcomes and overall satisfaction. Moreover, this solution aligns with the institution's

commitment to embracing technology to enhance student experiences and optimize administrative workflows.

Research Problem

Despite the recognition of the importance of accessible medical care for students at St. Vincent de Ferrer of Camarin, Inc., the existing methods for scheduling clinic appointments often present significant challenges, including long wait times, manual paperwork, and potential communication barriers. While the proposed CliniQuick Aid system aims to streamline the appointment scheduling process through virtual assistant technology, there remains a gap in understanding how effectively this technology can address the specific needs and preferences of Vincentian students.

Research Objective

Reestablishing the process of scheduling clinic appointments by providing an ideal, user-friendly platform that enhances accessibility, convenience, and efficiency for students seeking medical care.

Virtual assistant technology can be integrated into CliniQuick Aid by making a use of it's natural language processing (NLP) capabilities to create a system that interacts effectively with the students.

Compared to traditional methods, CliniQuick Aid’s virtual assistant technology can be integrated into CliniQuick Aid by making a use of it's natural language processing (NLP) capabilities to create a system that interacts effectively with the students.

CliniQuick Aid eliminates these issues by offering a virtual assistant-enabled appointment key features such as:

- **One-click booking**
- **Personalized recommendations**
- **Real-time availability**
- **Smart reminders**
- **Multiple platform access**

Research Framework

This theoretical framework outlines the user and admin access, processes, and expected outputs of the CliniQuick Aid project, emphasizing its features and goals of revolutionizing the scheduling of clinic appointments and fostering student welfare through innovative healthcare solutions.

Figure 1 Conceptual Framework on Virtual Assistant-Enabled Cliniquick Aid Appointment System

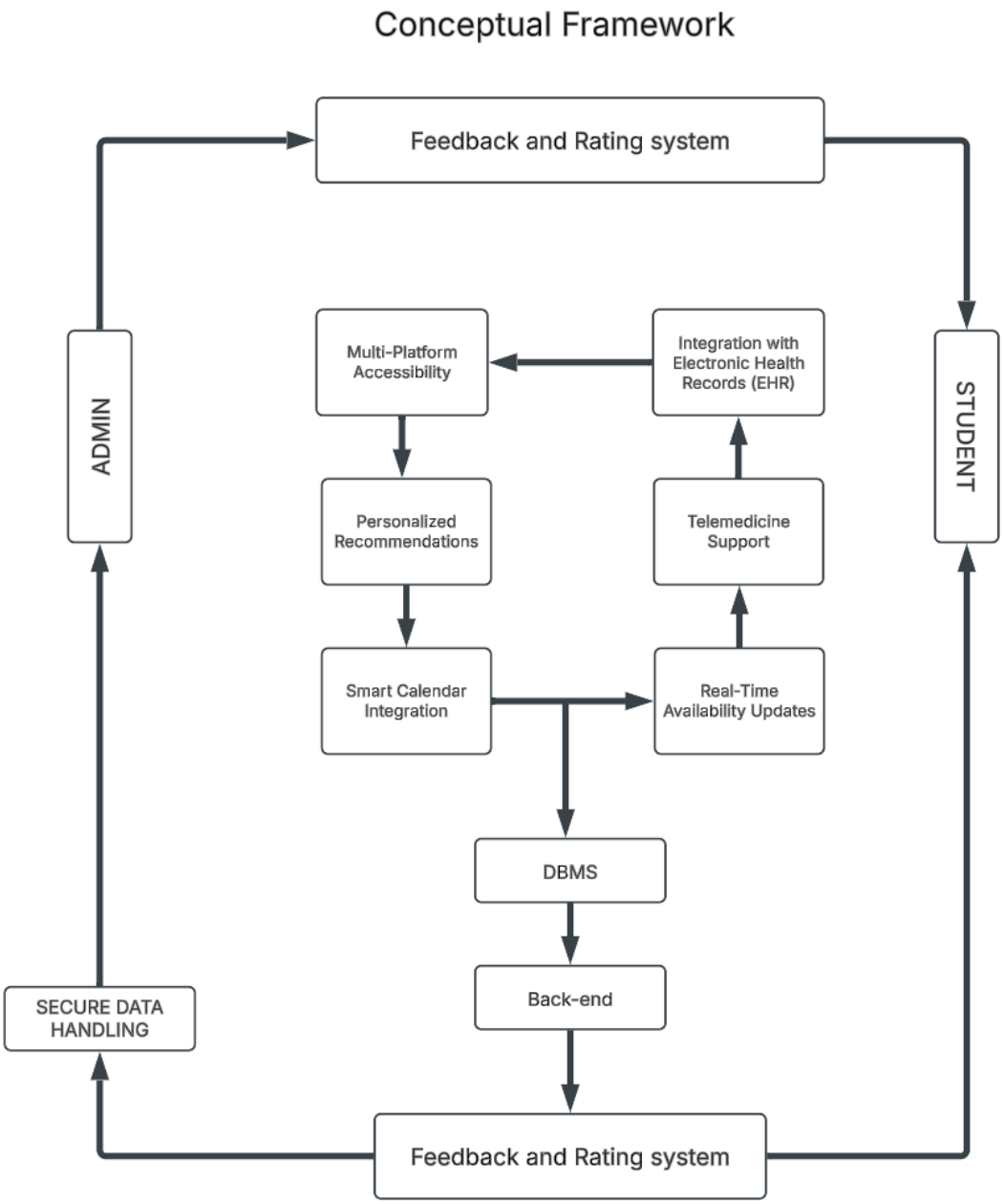
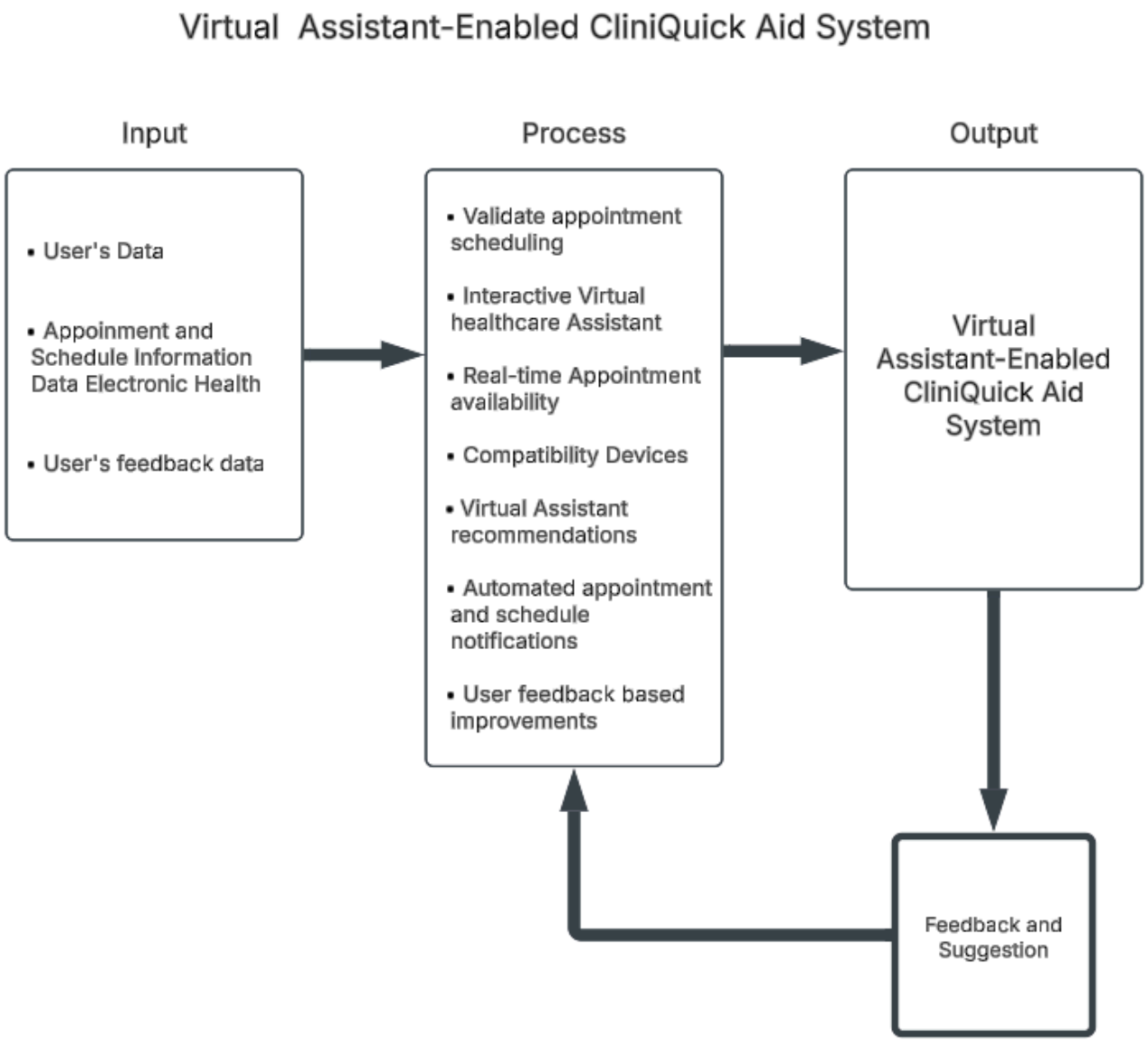


Figure 2 Input-Process-Output on Virtual Assistant-Enabled Cliniquick Aid Appointment System



Scope and Limitations of the Research

The CliniQuick Aid system will serve specifically to the students of St. Vincent de Ferrer of Camarin, Inc. located in Camarin, North Caloocan. The primary focus of the study is to develop and implement a user-friendly web-based that simplifies the process of scheduling clinic appointments for students. It will include features such as smart calendar integration, real-time appointment availability, personalized recommendations based on

medical history, and preferences, multi-platform accessibility, options for same-day appointments for urgent medical needs, integration with electronic health records (EHR), secure data handling and feedback and rating system, . The study will utilize digital healthcare solutions to optimize the appointment scheduling process, making use of technology to minimize wait times, reduce administrative burdens, and enhance overall healthcare delivery efficiency.

Meanwhile, the scope of this research will be limited to students of St. Vincent de Ferrer of Camarin, Inc. Other stakeholders such as faculty and staff will not be included in the initial phase of implementation. The functionality of the system may be constrained by technological limitations, including compatibility issues with certain devices or operating systems, as well as potential bugs or glitches during the initial stages of implementation. This study will need to address concerns regarding the privacy and security of students' personal and medical information stored within the CliniQuick Aid system. Robust measures will be implemented to safeguard sensitive data and ensure compliance with relevant privacy regulations. Furthermore, the development and maintenance of CliniQuick Aid may be subject to resource constraints, including financial, human, and technological resources. This may impact the speed of system implementation and the level of ongoing support and maintenance available to users.

Significance of the Research

The result of this study will benefit the following:

Enhanced SVFC Student's Wellbeing: The system helps St. Vincent de Ferrer College students in taking care of their health without affecting their academic obligations by simplifying the clinic appointment scheduling process. Easy access to healthcare services promotes improved mental and physical health, which benefits students' overall well-being and academic performance.

Healthcare Providers at St. Vincent de Ferrer of Camarin, Inc., Operational Efficiency: CliniQuick Aid reduces wait times, eases administrative burdens for medical staff at St. Vincent de Ferrer of Camarin, Inc., and improves clinic usage of resources. The effectiveness of the system helps students and medical professionals as well, resulting in a more efficient delivery of healthcare services.

SVFC Educational Institution Support: CliniQuick Aid's implementation shows St. Vincent de Ferrer of Camarin, Inc.'s devotion to creating a safe and health-conscious learning environment. By using technology to improve healthcare accessibility, the school shows that it is committed to the overall growth and welfare of its students.

Chapter II

Review of Literature

The importance of digital healthcare solutions in improving patient access to medical services. Digital appointment scheduling systems offer patients the convenience of booking appointments online, reducing the need for lengthy phone calls or in-person visits to the clinic, a study highlighted by Lyles, et al. (2018). By implementing CliniQuick Aid at St. Vincent de Ferrer of Camarin, Inc., it can leverage digital technology to enhance accessibility and efficiency in scheduling clinic appointments for its students.

Moreover, research by Whittaker, et al. (2019) highlights the effectiveness of reminder systems in reducing missed appointments and improving attendance rates in healthcare settings. Reminder systems, such as the one proposed in CliniQuick Aid, play a crucial role in prompting patients to attend their scheduled appointments, thereby minimizing appointment no-shows and optimizing clinic utilization. By incorporating reminder functionalities, CliniQuick Aid can contribute to improving appointment attendance rates and enhancing overall healthcare delivery efficiency.

Additionally, the importance of real-time appointment availability in healthcare scheduling systems. Real-time availability allows patients to view up-to-date appointment slots and choose appointments that best fit their schedules and preferences, research by Hsieh, et al. (2015). By enabling students to access real-time appointment availability, CliniQuick Aid enhances convenience and flexibility in scheduling clinic appointments, ultimately improving the overall patient experience and satisfaction.

According to Taghreed H. Almutairi, Sunday O. Olatunji (2024), Artificial Intelligence (AI) refers to the development of computer systems that can perform tasks that typically require human intelligence. The utilization of AI in healthcare, particularly in dental clinics, has drawn attention to the issue of appointment no-shows. These no-shows have detrimental effects such as increased waiting times, limited-service access, and financial burden on

healthcare providers. Therefore, optimizing the organization of dental clinics is crucial to effectively cater to a diverse patient population with varying dental needs, especially considering the projected rise in demand for dental care. To address the problem of appointment no-shows, the researchers proposed a programming model that harnesses machine learning algorithms.

As stated by Aditi Namdev, Ritvik Pande, Praveena Viswarajan, Mumbai.India (2021) Appointment booking is a part of everyday life nowadays. From booking movie show tickets to booking flight seats everything is online. In recent times the pandemic has brought some tough challenges before the healthcare systems which include appointment booking. As hospitals and clinics witness an overwhelming surge of patients the healthcare workers are found to be overburdened. Oftentimes important calls made by patients to the hospitals go unanswered or result in long wait times. Speech is the primary mode of communication among human beings. Many patients would prefer to call-in and book an appointment before visiting the crowded hospitals. This paper is focused on developing an AI voice bot which works on call to communicate with patients and subsequently book appointments and/or answer questions related to that hospital. Automatic Speech Recognition (ASR) is the process of deriving the transcription of an utterance, given in the speech waveform. This paper aims at completely automating the process of booking appointments in general, all through voice recognition. Instead of having to go through contact lists and learn different UIs, patients can simply have a conversation with the bot through a familiar interface. Not only will it book an appointment but also study the patterns in the database and predict future inflow of patients and suggest constructive advice for the system. This will not only save patient's critical time, but also reduce the burden on healthcare workers and hence optimize the management of patients and their appointments.

According to K. Srivastava, T. N. Pandey, D. Roy and S. Sahoo (2023), to lower the healthcare charges and similarly increase openness to clinical facts the clinical chatbot is constructed. Certain chatbots pass approximately as clinical reference books, which facilitates the affected person to discover approximately their contamination and assists with running on their fitness. The person can accomplish the real gain of a chatbot simply while it is able to examine all forms of infections and deliver essential data. In later sections of the paper, a doctor appointment system software is also discussed that is integrated with the chatbot so that the specialist which is recommended by medical chatbot can be easily visited at the mutually agreed time of both specialist and patient. Such an appointment system has its own

advantages like it reduces the waiting time of the patient, patients can choose the appointment time in keeping with their desire additionally to be had and booked slots are proven in powerful graphical person interface.

As stated by Nazlı Tokatli, Muhammed Tayyip Koçak, Seda Kirtay, Gürkan Göztepeli, İbrahim Serhat Aktaş, Halis (2023), many studies proposed the use of AI-based chatbots and machine learning algorithms in healthcare systems to improve clinic operations, reduce patient wait times, and predict outpatient appointment no-show rates. This paper describes the conception and implementation steps of an innovative (mhealth app) that uses open AI tools to prioritize and classify outpatients based on their symptoms. Our AI-based appointment scheduling app will decide for the outpatient either to schedule appointments with primary care facilities or direct them to the appropriate healthcare department in hospitals only when absolutely necessary, thereby nurturing a more efficient, patient-centered healthcare service.

According to Shiva Maleki Varnosfaderani, Forouzanfar, Mohamad (2024), as healthcare systems around the world face challenges such as escalating costs, limited access, and growing demand for personalized care, artificial intelligence (AI) is emerging as a key force for transformation. This review is motivated by the urgent need to harness AI's potential to mitigate these issues and aims to critically assess AI's integration in different healthcare domains. We explore how AI empowers clinical decision-making, optimizes hospital operation and management, refines medical image analysis, and revolutionizes patient care and monitoring through AI-powered wearables. Through several case studies, we review how AI has transformed specific healthcare domains and discuss the remaining challenges and possible solutions. Additionally, we will discuss methodologies for assessing AI healthcare solutions, ethical challenges of AI deployment, and the importance of data privacy and bias mitigation for responsible technology use. By presenting a critical assessment of AI's transformative potential, this review equips researchers with a deeper understanding of AI's current and future impact on healthcare. It encourages an interdisciplinary dialogue between researchers, clinicians, and technologists to navigate the complexities of AI implementation, fostering the development of AI-driven solutions that prioritize ethical standards, equity, and a patient-centered approach.

While virtual assistant-enabled clinic appointment systems hold great promise, their successful implementation requires careful consideration of various factors. These include ensuring data privacy and security, addressing potential technological barriers, and providing

adequate training and support for users and administrators (Robinson & White, 2021). Moreover, effective integration with existing healthcare infrastructure, such as electronic health records (EHR) systems, is essential for seamless operation and interoperability (Gupta et al., 2021).

Synthesis

The synthesis of the literature review highlights the transformative potential of digital healthcare solutions, particularly virtual assistant-enabled clinic appointment systems, in improving patient access to medical services and optimizing healthcare delivery. Several key themes emerge from the reviewed studies.

The importance of digital healthcare solutions in improving patient access to medical services. Digital appointment scheduling systems offer patients the convenience of booking appointments online, reducing the need for lengthy phone calls or in-person visits to the clinic, a study highlighted by Lyles, et al. (2018).

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Chapter III

Research Methodology

This chapter describes the methodology used in conducting the research study. It describes the study strategy, data collection methods, and data analysis methodologies utilized to achieve the research objectives and respond to the research questions. The chapter also discusses the study population, sampling methods, and ethical considerations. By providing a clear and comprehensive description of the technique, this chapter ensures the research findings' validity and reliability.

Research Design

In this study, we aim to implement a new system appointment for the school clinic and help effectively for the student and clinic staff of Saint Vincent de Ferrer College in regards to health concerns, appointment schedules, and health consultants. A mixed method approach was used in this research. Based on Fernando A. (2018) Mixed method research is an approach that combines both quantitative and qualitative methods into a single study in order to provide a broader and more complete vision of a problem. Additionally, this approach was used in research to utilize the data that gathered from the target participants specifically, students and administrators of clinics in what is needed to develop and design in a system. Thus, collecting non-numerical data such as interviews in clients is called qualitative methods. While, collecting numerical data from a target participant through surveys and questionnaires is under quantitative methods. This type of research will help researchers to implement and improve the system that is currently used in school clinics.

The data gathered from surveys and questionnaires were evaluated and reviewed

thoroughly and analyzed using frequency count and statistical analysis.

Locale of the Study

The data collection will be conducted at St. Vincent de Ferrer of Camarin, Inc. It is located in Area D, SVFC Compound, San Vincente Ferrer St, Brgy 178 Camarin, Caloocan, 1400 Metro Manila. The respondents will be interviewed online via google form and is done during the second semester of the Academic Year 2023-2024.

Applied Concepts and Techniques

The Virtual Assistant-Enabled Cliniquick Aid: Effortless One-Click Appointments applies the significant attention promising the clinics effortless assessments for the students in St. Vincent de Ferrer College of Camarin Inc. By adapting Artificial Intelligence (AI) in the system, it helps minimize the long hours of scheduling and knowing when, and what time the clinic is available and active. The focus of this project is to reduce the time and effort in requiring the time to book their schedules in the school healthcare providers. Enhancing the appointment scheduling process for both students and healthcare providers by using the advantage of technology, greatly increases the overall process of delivery efficiency.

Using Artificial Intelligence (AI) to manipulate and provide personalized recommendations and preferences based on the students medical history, aligning the specific healthcare needs and preferences. Used Natural Language Processing (NLP) via php to enable the virtual assistant (VA) to respond and understand the users queries in natural language, making the system more intuitive and user-friendly.

Focusing on the User Experience (UX) the system is designed to focus on the needs of the user and preferences for the students, ensuring the interface to have an easy use for navigation and accessibility. Taking it on an online platform creates the ease of use in terms of responsive design, which the application is accessible on various devices, including smartphones, tablets, and computers providing flexibility.

Chatbot development using php uses a combination of predetermined rules and Artificial Intelligence (AI) driven responses to help handle a wide range of queries and scenarios which overtime the chatbot is designed to learn from the interactions to furthermore improve its accuracy and effectiveness.

Adapting the use of data analytics and report, having data on the system usage in peak times including the common queries is analyzed and improved mainly on its service. Appointment data in health trends monitors how it could help to identify the common health issues among students mostly in informing the school health policies.

Realtime calendar integration on the system helps to avoid conflicts on personal and school calendar's scheduling which would automatically send reminders. Helping the queue management system to prioritize the appointments based on urgency and availability of the user.

Algorithm Analysis

In the CliniQuick Aid System (CAS) module, Algorithm analysis is critical to keeping systems fast, efficient, and scalable. This analysis helps you identify the most effective algorithms for tasks such as scheduling, learning user preferences, and notifications. By systematically analyzing and optimizing these processes, CliniQuick Aid can deliver a seamless, one-click scheduling experience that meets the expectations of modern healthcare consumers.

Efficiency Analysis

The efficiency of the virtual assistant (VA) in the CliniQuick Aid system is being thoroughly analyzed to ensure seamless and resourceful use of hardware and software resources, enhancing the overall user experience, efficiency can be evaluated based on the following factors:

Response Times: Evaluate how quickly the VA responds to user queries and commands. This includes measuring the time taken from user input to the assistant's response.

Complexity: The scheduling algorithm's scaling with increasing appointment slots, healthcare providers, and user requests significantly impacts the time taken to find and book available slots. Evaluate how much computational power and memory the scheduling process consumes, aiming to optimize for lower resource use.

Query Optimization: Measure the efficiency of database queries used to retrieve,

update, and manage appointment and patient data. Optimizing queries can significantly reduce the load on the system's database servers.

Scalability: Evaluate how efficiently users can achieve their goal of booking an appointment. This involves assessing the number of clicks, page loads, and potential confusion points within the UI. Measure how quickly interface elements load on various devices, which affects user satisfaction and accessibility

Effectiveness Analysis

Effectiveness Analysis of Virtual Assistant-Enabled CliniQuick Aid ensures improvements in clinical setting, meeting suppliers' needs with rightness, strength, convenience, adaptability, and down-to-earth execution through regular upgrades and thorough testing.

Correctness - Ensuring the virtual assistant provides accurate and reliable medical information, diagnoses, and recommendations.

Robustness - The ability of CliniQuick Aid to handle a wide range of inputs, including incomplete or ambiguous queries, without failing.

Usability - Ensuring that healthcare professionals and patients can easily interact with the system, find it intuitive, and understand its outputs.

Adaptability - The ease with which the system can be updated with new medical guidelines, integrated with other healthcare systems, and customized for different specialties.

Impact Analysis

Operational Efficiency :

Automating arrangement planning will diminish the workload on administrative staff, permitting them to center on other assignments.Streamlined Processes:

Streamlined Processes: The virtual assistant will handle schedule assignments such as arrangement confirmations, updates, and cancellations, progressing in general effectiveness.

Student Experience

Convenience : Students can plan, reschedule, and cancel arrangements effortlessly through a user-friendly interface.

Reduced Wait Times : Progressed planning precision will offer assistance minimize hold up times, driving to distant better / a much better a higher / a stronger / an improved /an improved by and large encounter.

Availability : 24/7 accessibility of the virtual partner implies students can book arrangements exterior of customary office hours.

Clinic Operations

Way better Asset Assignment :Improved planning will guarantee ideal utilize of clinic assets, anticipating overbooking or underutilization.

Data Collection and Examination :The framework can assemble information on arrangement designs, which can be analyzed to improve administrations and predict request.

Potential Risks Specialized Issues : Possible framework blackouts or glitches that may disturb planning.

Client Appropriation : Guaranteeing students and staff are comfortable utilizing the modern framework through preparing and back.

Privacy Concerns : Overseeing and securing individual health data to comply with relevant regulations.

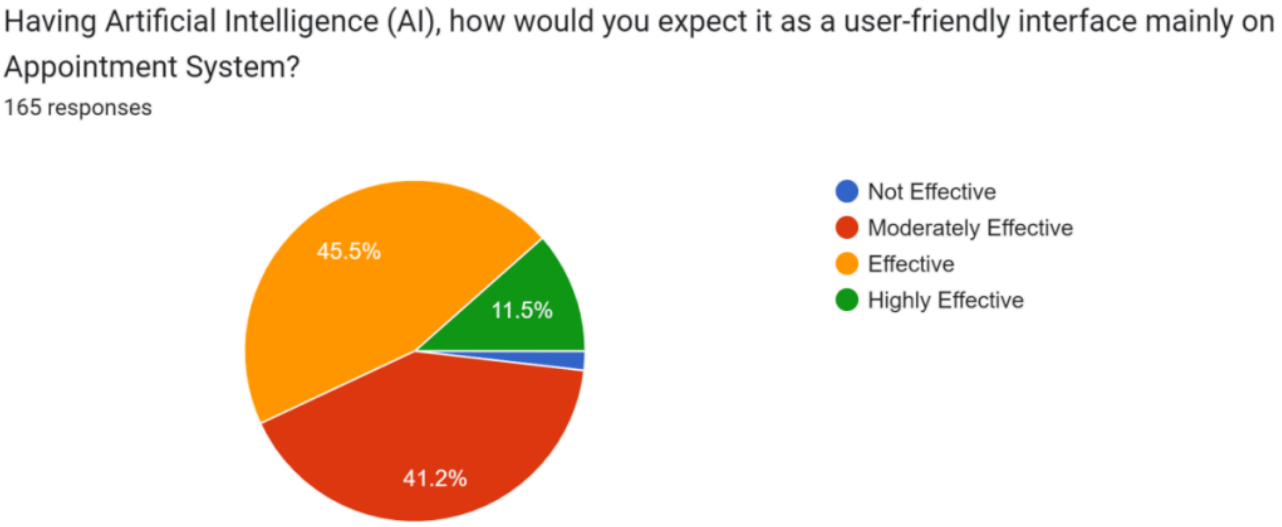
Implementing the Virtual Assistant-Enabled CliniQuick Help at St. Vincent de Ferrer of Camarin, Inc. has the potential to essentially improve arrangement planning effectiveness and improve the student experience. By automating schedule tasks and giving a helpful planning interface, the framework will streamline clinic operations, reduce administrative burdens, and improve asset assignment. In any case, cautious planning, preparing, and back are fundamental to address potential dangers and guarantee successful usage.

Data Collection Methods

In order for the researchers to gather data, the researchers wrote a permission letter to the school clinic's administrators to conduct interviews and data gathering.

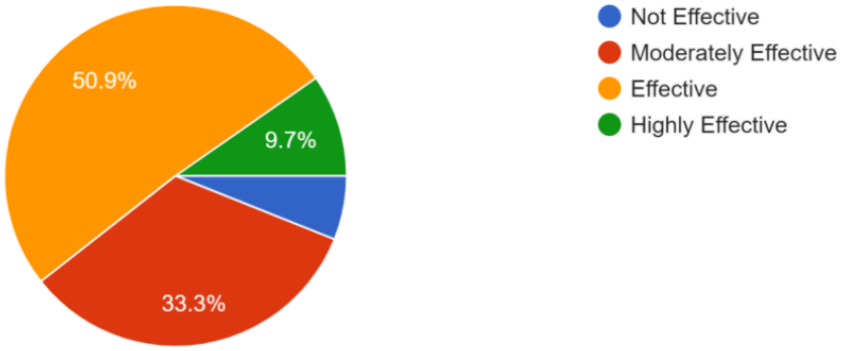
Upon the approval of the permission letter, the researchers then began to create surveys for the school administrators and for the targeted respondents which are the SVFC students.

Figure 3 Student Survey Questionnaire with Results (ASSUMPTION SURVEY: IS AI EFFECTIVE ON IMPLYING IT TO THE APPOINTMENT SYSTEM)



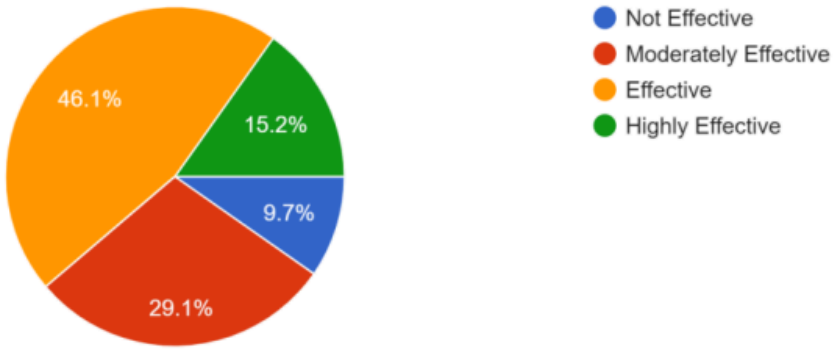
Does having an AI-chatbot on a system would greatly increase the overall effectiveness of the system's performance in terms of assigning and reco...ns for the patients? Specifically on the students?

165 responses



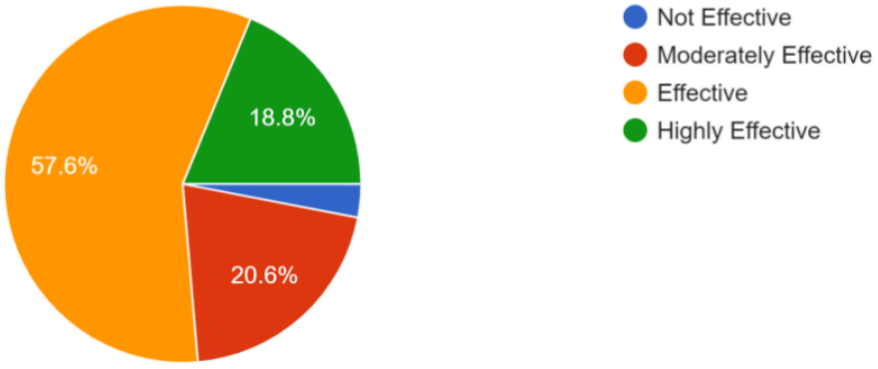
Focusing on Virtual Assistant, would it greatly increase the time to handle patients queries and handling clerical jobs on a system?

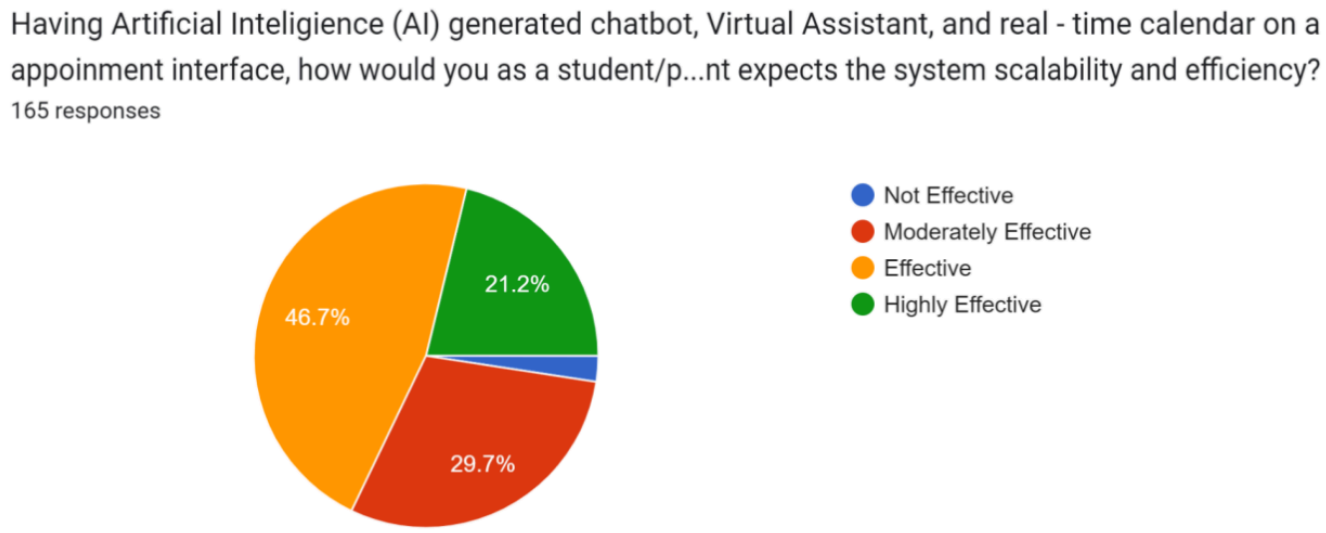
165 responses



Focusing on clinics appointment, does having a realtime calendar for generating the info's and patients history would greatly increase the patients status details?

165 responses





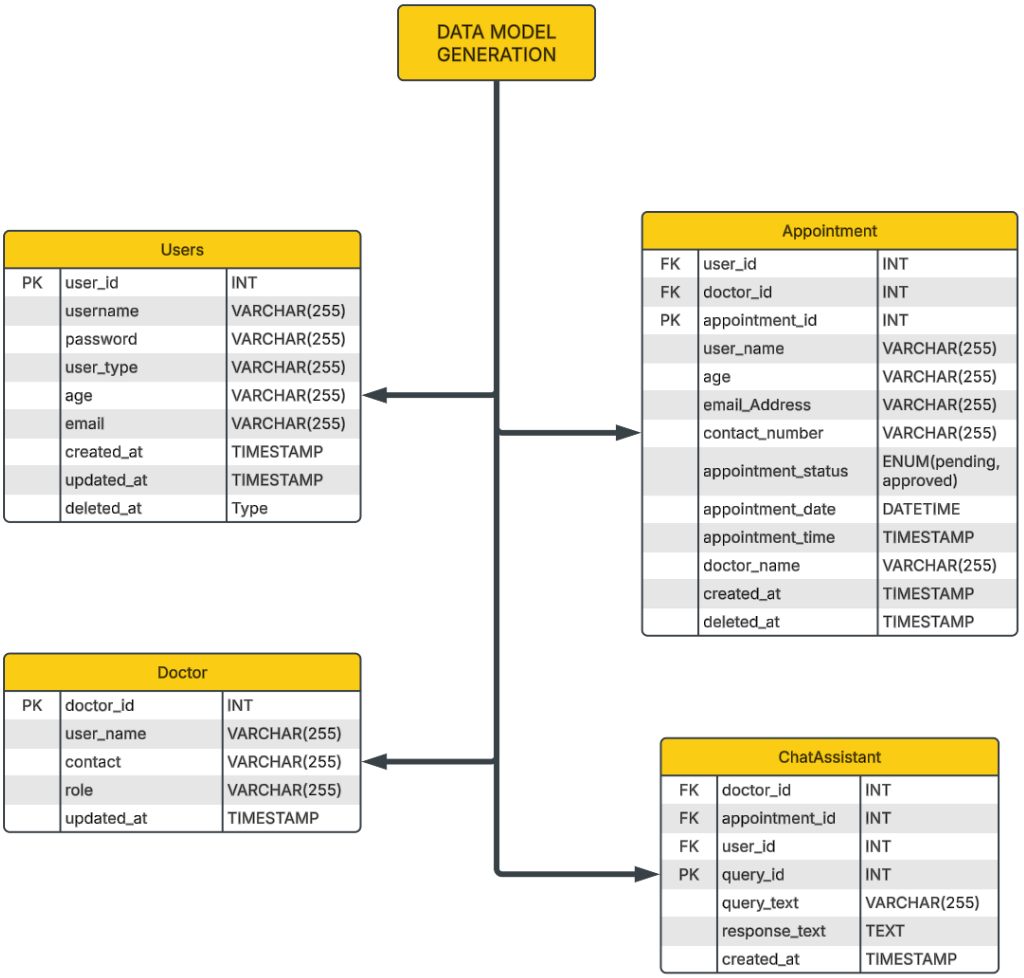
With St. Vincent de Ferrer of Camarin, Inc. composed of approximately 4,500 students, the researchers managed to survey 165 students via google form method.

The overall outcome of gathering data from the 165 students respondents resulted in being **49.36% Effective**, **30.78% Moderately Effective**, and **15.28% Highly Effective.**

In conclusion, the statistics show that having innovative features such as virtual assistants and real-time calendars in a clinic appointment system is stated to be effective.

Data Model Generation

Figure 5 Data Model



System Development Methodology

System development methodologies are really known as a framework for the development process that outline the step-by-step procedure including the documentation, planning, design, implementation, and maintaining the system project. Its activities are used to manage the system development project. A wide variety of methodology is able to select and use for the success of the system that ensures how it gains quality tailored to what expected outcome will be in a product therefore, choosing the right and best methodologies depending on the study needed to showcase the process development. In this study, Agile methodologies are the one and best fit that we use due to the capability and flexibility to visually demonstrate our development process.

.**Figure 6 Agile Model Development Methodology Process**

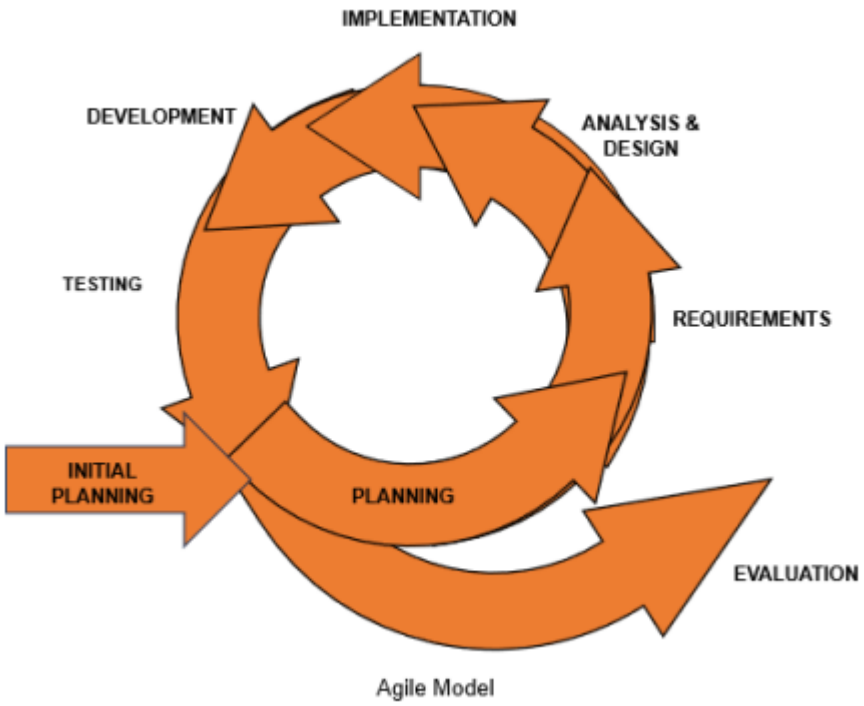


Figure 6 shows the development process with a different phase which is tailored to the expected outcome in a proposed system. This illustration helps to understand the flow of the development process to make a successful system implemented from start to end.

Initial Planning - This phase is the starting point of getting the scope, timeline, identifying involved organizations and individuals, the place where the research conducted, and the project constraints. In this study, The place and the school clinic staff and administrators in St. Vincent de Ferrer College, and students are involved in this phase.

Planning - This phase involves jot down tasks, assigning roles, and detailed planning and the expected outcome for each task. It includes brainstorming of what the team needs to input in a system based on the users needs such as virtual assistant, user login and registration, and appointment booking. It also included the constraints and deadlines for each task for the goals

and achieved outcome.

Requirements - This phase is tailored on the initial planning and planning gathered data from the resources. All resources collected will be used as the foundation for creating a successful system. It includes the tools and product specifications that will be suitable to be used to implement a system.

Analysis and Design - This phase analyzes all data wherein can possibly use interviews and surveys for clarify any ambiguities and for any additional requirements. It checks information if all is suitable to design for the system. It centralized the main requirements which the users need to achieve the project goals. It is designed based on the analysis result including the user-friendly interface, easy to access, and the layer stages.

Implementation - This phase is about to apply all data and designs into a real-life situation. It includes coding together what programming languages and APIs will be used based on the specification given in the previous phases, documentation of each module for the purpose of continuously developing and reviews.

Development - This phase involved other components such as features in a system enhanced throughout iterative approach for continuous improvement. It includes the documentation of previous phase use for upcoming deployment and integration to streamline the development process together with the team.

Testing - This phase involves conducting testing in a system to identify if there's any bugs and issues. This phase is used to prevent the releasing of non working systems into the production and client. During testing, progress and results should be documented for future reviews and changes.

Evaluation - This last phase involves the complete functionalities and features in the system. The feedback and Performance should be documented for future iterations, improvement, and collaborative purposes, and analysis.

Hardware and Software Tools Used

<!-- The softwares used are Xampp (PHP) and Sql (database) backend development,

and HTML and CSS for frontend development. – >

The software and tools will be use to operate the system Xampp (for local hosting only and testing), Laravel frameworks (for PHP), SQL for database (backend development), and Bladewind or CSS for styling front end. (the frameworks for backend is to follow)

<!-- Pwedeng itable nalang din to para mas okay tignan/, tingin niyo - ->

Table 1: Specification of Software and Hardware Tools

Table 1 The table shows the specifications of the researcher's device (laptop) used to develop the system.

HARDWARE TOOLS	
Device Name	ACER
Processor	Intel core i7 - 7700HQ
ROM (Read Only Memory)	256GB

SOFTWARE TOOLS	
IDE(To build a system)	Visual Studio Code
Localhosting	XAMPP
Framework (PHP Frameworks)	Laravel
Database	MySQL or MySQL WorkBench
Website hosting	GoDaddy

System Requirements:
Any laptop/desktop or smartphone that has browsers (Chrome, Microsoft Edge).

<!-- More detailed tas pwede din lagay sa table para mas okay tignan →
<! - - In addition, add din tayo ng devices for users or whoever na gagamit ng system, much better less requirements devices specifications to make our system more accessible. It depends kung ano makukuha nating DNS for hosting (May bayad) - - >

USER'S HARDWARE & SOFTWARE TOOLS	
Storage	Atleast 64gb, 8gb RAM
Device	Desktop, Smart Phone
Web Browsers	Chrome, Microsoft Edge
Connectivity	Wi-Fi or Prepaid load that can able to access the system.

System Architecture

The architecture below showcases the Virtual Assistant-Enabled CliniQuick Aid system design to ensure and provide the students a secure, efficient, user-friendly experience for booking clinic appointments. By the use of Artificial Intelligence (AI) integration, robust, and responsive design in security measures, the system aims to meet the needs of the students in St. Vincent de Ferrer College of Camarin Inc. ensures them to have quick and easy access to healthcare services of the clinic.

FigureVirtual Assistant-Enabled CliniQuick Aid System Design

Figure X: This section can be represented by Hierarchical Input-Process-Output (HIPO). Provide an explanation about the diagram.

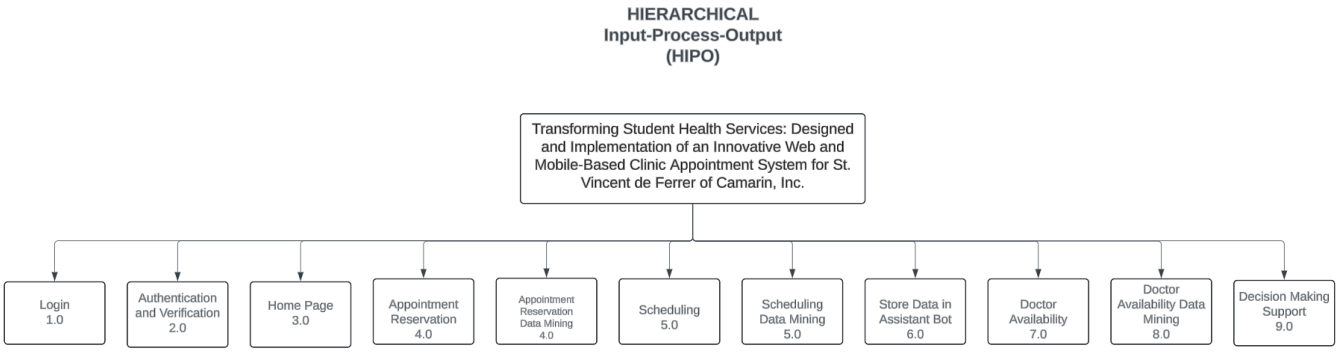
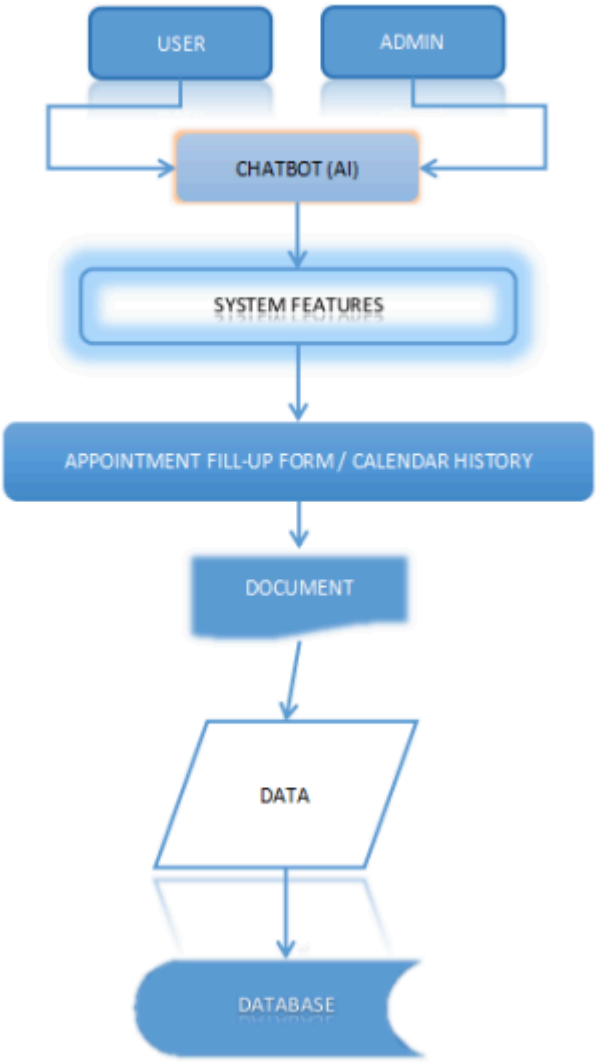


Figure X: Sample of HIPO



<!-- SYSTEM ARCHITECTURE: FOR THE MEANTIME - - >

<HAVE FIGURE ILLUSTRATION>

Software Testing

Software testing is the process of experimentally verifying that a program operates correctly. Thorough software testing of the Cliniquick Aid Appointment System is conducted at St. Vincent de Ferrer of Camarin in Caloocan to guarantee that its functioning satisfies the requirements of SVFC students and offers a dependable platform for making medical appointments. It aims to efficiently run the medical aid appointment process in order to increase student convenience and effectiveness.

References:

M. V. Moresca, S. Inversini, and L. Buhalis, "Virtual Reality and Augmented Reality in Tourism," in Information and Communication Technologies in Tourism 2019, M. Sigala, E. Christou, and G. A. Gretzel, Eds. Cham: Springer International Publishing, 2019, pp. 383–395. [Online]. Available: https://doi.org/10.1007/978-3-030-05940-8_29

A. N. Chien and C. K. Chen, "The Development of Virtual Reality Applications for Tourism and Leisure," in Proceedings of the 2019 6th International Conference on Industrial Engineering and Applications, Tokyo, Japan, 2019, pp. 241–245. [Online]. Available: https://doi.org/10.1145/3314044.3314052

L. K. Johnsen and S. Guldvik, "Understanding Augmented Reality Applications for Tourism Destinations," in Information and Communication Technologies in Tourism 2017, R. Schegg and B. Stangl, Eds. Cham: Springer International Publishing, 2017, pp. 343–355. [Online]. Available: https://doi.org/10.1007/978-3-319-51168-9_26

A. Tussyadiah, "Augmented Reality and Virtual Reality: The Future of Tourism Experiences," in The Future of Travel, M. A. Wöber, A. Fuchs, and J. E. Höpken, Eds. Berlin, Heidelberg: Springer Berlin Heidelberg, 2016, pp. 125–140. [Online]. Available: https://doi.org/10.1007/978-3-662-44061-1_9

Lyles, C. R., Sarkar, U., Osborn, C. Y., Glassman, P. A., Gourley, G. I., Holtzman, L. J., ... & Schillinger, D. (2018). Getting actionable about health literacy: a pathway to improving comprehension of digital health communication. MDM Policy & Practice, 3(1), 2381468318766484.

Whittaker, W., Anselmi, L., Kristensen, S. R., Lau, Y. S., Bailey, S., Bower, P., ... & Checkland, K. (2019). Associations between extending access to primary care and emergency department visits: a difference-in-differences analysis. PloS One, 14(8), e0220794.

Hsieh, C. H., Lin, H. H., & Chao, P. Y. (2015). A real-time scheduling system for outpatient appointments: a case study in a regional hospital. BMC Health Services Research, 15(1), 1-12.

Almeida, F. (2018). Strategies to perform a mixed methods study. European Journal of Education Studies.

Taghreed H. Almutairi, Sunday O. Olatunji (2024). “Utilization of AI in healthcare to predict no-shows for dental appointments: A case study conducted in Saudi Arabia,Informatics in Medicine Unlocked.”

Aditi Namdev, Ritvik Pande, Praveena Viswarajan, Mumbai.India (2021) “Automated Appointment Booking System via Voice Recognition.”

K. Srivastava, T. N. Pandey, D. Roy and S. Sahoo (2023), "A Machine Learning Model on Healthcare Based Chatbot and Appointment System.”

Shiva Maleki Varnosfaderani, Forouzanfar, Mohamad (2024) “The Role of AI in Hospitals

and Clinics: Transforming Healthcare in the 21st Century."

Robinson, D., & White, L. (2021). Technological Considerations for Implementing Virtual Assistant-Enabled Healthcare Systems. Journal of Medical Informatics, 37(4), 278-291.

SUGGEST AND

RECOMMENDATIONS DITO

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