**CLINIC MANAGEMENT SYSTEM FOR**

**PHILIPPINE CHRISTIAN UNIVERSITY – DASMARIÑAS**

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**CHAPTER 1**

**THE PROBLEM AND ITS BACKROUND**

**1.1 INTRODUCTION**

There are a lot of universities that has clinic inside campus. Students and staff who suffer from sick or pain will visit the clinic. Some universities require health record of a student before enrollment. However, most of the staff in the clinic still using paper works in their workflows. Those paper works such as student registration using form, student health record, faculty and staff health record, Dental form and so on. Because of these manual operations are done by few nurses in a clinic, it may slow down the procedure in many ways. For example, when the doctor uses health record to write the patient’s diagnosis record, the health record needs to be kept in the clinic by put them on the metal steel drawer. Once the clinic operates for few years and a thousand of students enrolled every year, there will be a lot of health record on the metal steel drawer. So, when a student comes to the clinic, the nurse maybe needs use 5 to 10 minutes to find the student’s health record which is quite wasting time.

The technology improves a lot today. A lot of computer-based system can help to manage business process. According to Appian 2021, business process is a set of activities and tasks and the process must involve clearly defined inputs and a single output. Once a system can manage the business process, a lot of works are able to automation and no need manual operation. Clinic management system is one of the invented management systems in the market to help business process of a clinic inside campus. Clinic management system is defined as a computer system that helps manage the information of the university clinic effectively. Because of this system the university clinic can easily automate all the records with no difficulties to use compare in using the manual system or the traditional way of getting and compiling all the records. This Clinic Management System promotes an innovative way of keeping all the records and can be secure the confidentiality of the all the data. It is a user-friendly system because it made the operation paperless when it comes in getting, keeping and viewing needed data. The admin will administer the system and the one who is capable to add, update and delete in the data, keep track of the system and monitor all information.

According to Longest et al., (2000) Management Information System (MIS) is typically a computer-based system which is used within an organization to improve its operations. It has been defined as the process comprising all the components that collect, process and disseminate data or information. Such components include hardware, software, users, communication systems such as telephone lines and the data itself. The technical functions and activities performed include entering data into the system, converting data into information, storing information and then producing relevant reports. Those predetermined objectivesare accomplished by humans and other resources.

Generally Automation plays an important role in the global economy and in daily experience. Software programmers strive to combine automated devices with mathematical and organizational tools to create complex systems for a rapidly expanding range of applications.

The Clinic Management System (CMS) is an automated system that is used to manage patient information and its administration. It is meant to provide the Administration, personnel and Staff, with information in real-time to make their work more interesting and less stressing.

* 1. **STATEMENT OF THE PROBLEM**

University clinic is the one responsible for safe-guarding the health of the scholars, students and school personnel in campus. It offers giving information, advice or counselling on medical matters, attend to student emergencies, providing basic medical and dental services, and promoting health and fitness among the school populace. The university clinic is still using manual system or what we called traditional management in keeping the data and information. Traditional management uses handwritten and manual approach of keeping business processes. The clinic does not have system in keeping and organizing the information of the university regarding health. This problem directly affects the management, students and personal inside the campus. Especially the administration who cannot easily tracks the data.

The main purpose of this study was to develop a clinic management system that will solve the mentioned problems.

**Specific Problem**

1. Manual systems take a lot of time in processing data.
2. The information or data can be easily mis-place or manipulate.
3. Individually looking in record book for the specific data.
4. An individual needs to be present in the university clinic to be able to address its concern.
5. An individual needs to go the clinic to be able to give its personal information for record purposes.
   1. **OBJECTIVES OF THE STUDY**

**General Objectives:**

The study aims to develop a Clinic Management System for Philippine Christian University – Dasmarinas Campus Clinic to provides them fast and accurate storing of data, a systematize workplace, reduce time consumption and lastly to monitor the records of information easily.

**Specific Objectives:**

1. To design a Clinic Management System for Campus Clinic with two users interfere.
2. The Clinic Management System for Philippine Christian University – Dasmarinas Campus was created with the following features:

* Single login form for multiple users interferes
* Generate individual health record of user

1. To assess the acceptance functionality of the Clinic Management System.
   1. **SCOPE AND LIMITATION**

The study aim was to develop a Clinic Management System for Philippine Christian University Dasmarinas Campus. The system will be computerized that can keep, organize and generate files that can improve the administration’s productivity. The system is a health system that can monitor and allow the campus clinic to take data and track them in an easy way.

The main function of the system is to manage all the records accurately from students to personnel’s data and can generate reports whenever the admin or an individual wants to have a hard copy of the records.

The researcher used the application NetBeans IDE 8.2 with JDK 16.0.2 version in designing the system or website, XAMPP Control Panel for establishing the database of the system, and Google Chrome for testing the system.

The system will store the data of the student and staff health record. Every grade level of student has a different form to be fill up as well as in staff of the university. There are some areas that are not included in the study. The system is a Web-based, students and staffs can fill up and open the website of the clinic of the Philippine Christian University – Dasmariñas through online. The user account for students and staffs can only fill up and update their information, but cannot change the remarks and results of the consultation on the OPD.

* 1. **SIGNIFICANCE OF THE STUDY**

**The study will benefit to the following individual:**

* ***Administration***– The Clinic Management System help the campus clinic administration in many ways: monitoring the records of data, adding, updating, deleting and can view the information in the system in a way more convenient and hassle-free.
* ***Doctor, Nurse and Staff*** – The Clinic Management System will be useful for the staff in finding the health record, insert consultation data, and managing data as well as in helping them make performance assessments based on presented data easier. The current performance of the clinic is manual operation then it will be automated regarding in forms to be filled up.
* ***Students and Personnel*** – The Clinic Management System will benefit them to give their information even they are not around the campus. They can access the system to be able to raise their concerns. By this they can easily monitor if their concerns are being addressed.
* ***Future Researchers -*** The study can be a reference to future researchers, so they may also improve the Clinic Management System have made and add some more features into it.
  1. **CONCEPTUAL FRAMEWORK**

The development of Billing and Inventory Management System is anchored on the Input, Process, Output (IPO) model (DeSanctis & Poole, 1994) as stated below.

**INPUT**

Knowledge Requirements

• Knowledge about management system

• Interview and Observation on the current process

• Knowledge in PHP, HTML, CSS and Javascript

• Knowledge in health Concepts

• Knowledge in System Analysis and Design

Software Requirements

• NetBeans IDE 8.2

• JDK 16.0.2

• XAMPP Control Panel

• Google Chrome

**PROCESS**

● Data gathering by conducting interviews from the experts Philippine Christian University Dasmarinas Campus

● Analyzing all the gathered data.

● Planning and gathering the importance and requirements of the system.

● Designing the system according to the gathered data.

● Developing the system through coding and testing.

**OUTPUT**

**DEVELOPMENt**

**OF HEALTH MANAGEMENT**

**SYSTEM FOR**

**PHILIPPINE**

**CHRISTIAN UNIVERSITY**

**DASMARINAS**

**CAMPUS**

**EVALUATION**

*Figure 1: The Conceptual Model of the Study*

As shown in figure 1 the conceptual model of the study contains four phases. In Phase 1, it consisted of Input it included the software requirements and knowledge requirements. Software requirements identifying the development tools that will be use in the system and familiarization of the language that was used the study and the knowledge requirements. Knowledge requirements are about knowledge about management system, interview and observation on the current process, knowledge in PHP, HTML and CSS languages, knowledge in health Concepts, knowledge in System Analysis and Design. While in Phase 2 it consisted the process in the developed system. The first three step involved Data Gathering, analyzing the information, planning the requirements of the system, and lastly to design and develop the system maintenance through testing. In Phase 3 it contains the output of Developmental of Clinic Management System for Philippine Christian University Dasmarinas Campus. Lastly, Phase 4 consisted of the evaluation of the Heath Management System from the system evaluators such as IT experts and Potential Users.

* 1. **DEFINITION OF TERMS**

**Administrator-** According to Chen (2020) Administrator is an appointed individual who handles all remaining financial matters. The administrator organizes all the pieces and settles outstanding debt, expenses and other obligations.

**Administration** – According to Cambridge Dictionary it is the [arrangements](https://dictionary.cambridge.org/us/dictionary/english/arrangement) and [tasks](https://dictionary.cambridge.org/us/dictionary/english/task) [needed](https://dictionary.cambridge.org/us/dictionary/english/needed) to [control](https://dictionary.cambridge.org/us/dictionary/english/control) the [operation](https://dictionary.cambridge.org/us/dictionary/english/operation) of a [plan](https://dictionary.cambridge.org/us/dictionary/english/plan) or [organization](https://dictionary.cambridge.org/us/dictionary/english/organization).

**Management System** – According to ISO a management system is the way in which an organization manages the interrelated parts of its business in order to achieve its objectives. These objectives can relate to a number of different topics, including product or service quality, operational efficiency, environmental performance, health and safety in the workplace and many more.

**Database -** According to Britannica (2020) database is a logically organized collection of information, designed in such a way that the information within can be accessed for later use by a computer program.

**Graphic User Interface** - According to Computer Hope (2021) a GUI (graphical user interface) is a system of interactive visual components for computer software. It displays objects that convey information, and represent actions that can be taken by the user. The objects change color, size, or visibility when the user interacts with them.

**Manual System** - According to Accounting Tool (2021) manual system is a bookkeeping system where records are maintained by hand, without using a computer system. Manual systems are most commonly found in small enterprises that have few transactions.

**Technology** - According to Cena (2020) technology is the use of scientific knowledge for practical purposes or applications, whether in industry or in our everyday lives.

**Software Interface** - According to Beal (2014) it is the languages and codes that the applications use to communicate with each other and with the hardware.

**NetBeans –** It is an integrated development environment (IDE) for Java. NetBeans allows applications to be developed from a set of modular software components called modules. NetBeans runs on Microsoft Windows, macOS, Linux and Solaris. In addition to Java development, it has extensions for other languages like PHP, C, C++, HTML5, and JavaScript. Applications based on NetBeans, including the NetBeans IDE, can be extended by third party developers.

**Java Development Kit (JDK) –** JDK is an implementation of either one of the Java Platform, Standard Edition, Java Platform, Enterprise Edition, or Java Platform, Micro Edition platforms released by Oracle Corporation in the form of a binary product aimed at Java developers on Solaris, Linux, macOS or Windows. The JDK includes a private JVM and a few other resources to finish the development of a Java application. Since the introduction of the Java platform, it has been by far the most widely used Software Development Kit (SDK).

**XAMPP –** is a free and open-source cross-platform web server solution stack package developed by Apache Friends, consisting mainly of the Apache HTTP Server, MariaDB database, and interpreters for scripts written in the PHP and Perl programming languages. Since most actual web server deployments use the same components as XAMPP, it makes transitioning from a local test server to a live server possible.

**PHP –** According to Rasmus Lerdorf (1994) it is a general-purpose scripting language geared towards web development. PHP code is usually processed on a web server by a PHP interpreter implemented as a module, a daemon or as a Common Gateway Interface (CGI) executable. On a web server, the result of the interpreted and executed PHP code – which may be any type of data, such as generated HTML or binary image data – would form the whole or part of an HTTP response. Various web template systems, web content management systems, and web frameworks exist which can be employed to orchestrate or facilitate the generation of that response. Additionally, PHP can be used for many programming tasks outside of the web context, such as standalone graphical applications and robotic drone control. PHP code can also be directly executed from the command line.

**CSS –** Cascading Style Sheets or CSS is a style sheet language used for describing the presentation of a document written in a markup language such as HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript. CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple web pages to share formatting by specifying the relevant CSS in a separate .css file which reduces complexity and repetition in the structural content as well as enabling the .css file to be cached to improve the page load speed between the pages that share the file and its formatting.

**HTML –** According to Web Hypertext Application Technology Working Group (1993) HyperText Markup Language or HTML is the standard markup language for documents designed to be displayed in a web browser. It can be assisted by technologies such as Cascading Style Sheets (CSS) and scripting languages such as JavaScript. Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.

**JavaScript** – is a programming language that conforms to the ECMAScript specification. JavaScript is high-level, often just-in-time compiled, and multi-paradigm. It has curly-bracket syntax, dynamic typing, prototype-based object-orientation, and first-class functions. Alongside HTML and CSS, JavaScript is one of the core technologies of the World Wide Web. Over 97% of websites use it client-side for web page behaviour, often incorporating third-party libraries. Most web browsers have a dedicated JavaScript engine to execute the code on the user's device. As a multi-paradigm language, JavaScript supports event-driven, functional, and imperative programming styles. It has application programming interfaces (APIs) for working with text, dates, regular expressions, standard data structures, and the Document Object Model (DOM).

**GOOGLE CHROME –** is a cross-platform web browser developed by Google. It was first released in 2008 for Microsoft Windows built with free software components from Apple WebKit and Mozilla Firefox. It was later ported to Linux, macOS, iOS, and Android where it is the default browser built into the OS. The browser is also the main component of Chrome OS, where it serves as the platform for web applications.

**CHAPTER II**

**Review of Related Literature and Studies**

This chapter presents the review of related literature and studies from both local and foreign sources.

**2. 1. Foreign Related Literature and Studies**

According to Srivastava, A. (2011) Software Health Management (SWHM) is a new discipline that focuses on the creation of tools and technologies that allow for the automated detection, diagnosis, prediction, and mitigation of adverse events caused by software flaws. Modern software systems can display a wide range of failure modes that are undetectable throughout the verification and validation process. While standard techniques for error handling, fault detection, and isolation can be beneficial for many systems, it is becoming clear that new technologies and methods are required for the development of techniques to detect, diagnose, predict, and then mitigate adverse events caused by software that has already undergone extensive verification and validation procedures.

According to Mahadevan, N. (2011) The rising complexity of software employed in large-scale, safety-critical cyber-physical systems makes detecting and correcting all potential flaws more challenging. Existing fault tolerance strategies must be supplemented with new approaches that address latent software flaws discovered at runtime. This paper describes a method for improving software dependability by formalizing runtime monitoring, diagnosis, and mitigation tactics, which borrows and adapts existing 'System Health Management' techniques.

According to Dubey, A. (2011) The increasing complexity of software systems necessitates the employment of run-time techniques to provide fault control services. Because testing and verification may not cover all of the probable scenarios that a system will face, a simplified, yet formally stated run-time monitoring, diagnosis, and fault mitigation architecture is required to improve the software system's dependability. The technique described in this paper takes concepts and principles from the subject of "Systems Health Management" and applies them to complex systems, resulting in a two-level health management strategy that can be implemented using a model-based software development process.

According to Dhanore, P. (2016) A dental clinic is an institution that is in charge of delivering health medication and therapy to patients of all types of dental problems. Most medical sectors are now using network services and providing online web services to provide greater benefits to both their stakeholders and themselves, including the way individuals book appointments. As a result, a system named Dental Clinic Management System with Web Notification will be developed to address all of the clinic's present issues.

According to Dr. May Paing Paing Zaw (2019) Myanmar's health-care industry is rapidly expanding. For the best results, current health-care delivery organizations focused on efficiency and patient happiness. Most clinic patients in underdeveloped nations are faced with obtaining information from the doctor and the clinic, queuing at the counter for registration, and gathering and waiting in the clinic's lobby (or waiting room). This could result in patients having to call the doctor for information (which may be unavailable), long wait times for patients, and high workloads for counter workers due to queuing. One of the major processes in this environment to tackle these challenges is a web-based online reservation system.

According to Lubis, M. (2019) Clinic management systems have the ability to organize and organize the natural processes in a health institution so that they are in sync with the needs of the patients. The goal of this paper is to examine the common theme that will be used in the application's user interface by identifying user specifications based on the context. The user experience was used to assess the essential aspects of implementation success relating to the human dimension of the mental model, namely utility, ease of use, and efficiency. This paper makes two contributions: first, the design process should be carried out through a massive redesign of the major business process in order to achieve a significant increase in the capacity, capability, and quality of the service. Second, information should be presented in a variety of ways, with an emphasis on having additional platforms and modes to promote accessibility and availability.

According to Slaughter, M (2010) For severe heart failure patients who require long-term mechanical circulatory support, continuous-flow left ventricular assist devices (LVAD) have become the standard of care. Clinical care of LVAD-supported patients that is evidence-based is becoming increasingly crucial for improving outcomes. We offer critical features in managing patients supported by the new continuous-flow LVADs in this state-of-the-art review.

According to Muhsin Hassanu Saleh (2020) intends to improve the medical industry by addressing the online hospital administration system. Patients tend to spend a lot of time in treatment, which leads to a lot of patient attention. Recently, the manual system was examined in detail with the goal of determining the need to improve it. A computerized program was created to improve the care of individual patients by utilizing computer speed, storage, and retrieval capabilities. The program was created to handle the registration, invoicing, treatment, and payment of patients.

According to NM Malshani (2020) The most essential aspect in the country's development is its healthcare system. When it comes to healthcare, the contribution of hospitals is invaluable. There are two types of hospitals in Sri Lanka. Government and commercial hospitals, for example. The majority of individuals in this country seek care at government hospitals. Long-term treatments for age-related disorders are one part of the treatment. Clinics are held at hospitals to treat these age-old ailments. Those clinics are divided into groups depending on the most common disease types. The difficulties of the current manual hospital clinic administration system and how it was changed to an automated computerized system were the focus of this study. This study was conducted using a qualitative and quantitative survey methodology. The online poll was distributed by email, and 300 participants from the western province of Sri Lanka completed it.

**2. 2. Local Related Literature and Studies**

According to Maguire, J. (2018) One of the most significant instruments for keeping information is a management information system. Information management can be divided into two categories. The first entails filing papers with a pen and paper. Because of the natural components that can cause harm, this type of technology is not very reliable, and it takes a long time to find information while utilizing it. The second is a computer-generated management information system often employed in the twenty-first century. People nowadays rely on technology more than ever before. This simplifies and streamlines data administration. This is also a response to the rapid growth and rising management information system concerns that have a global impact on many businesses.

According to Bergado, T. (2020) The demand for digitized medical records has increased in the digital age. The purpose of this study was to establish the benefits that the system provides to the school clinic and how easy it is to manage the medical records and staff of Saint Michael College of Caraga pupils (SMCC). While the current CPD framework is superior to paper in general, it frequently falls short of meeting the client's needs since it is based on an outdated paper-outline' mindset (Gad & Ramadan, 2013). According to the research, the system is both necessary for handling medical records and advantageous to the institution. Furthermore, this system secures data and adds information to both students and personnel, including their clinic consultations. Furthermore, the technology updates the information anytime the patient's condition changes, allowing the clinic attendant to track data quickly. The system also generates three types of reports that are simple to use. It was suggested that the system be implemented in the school clinic to improve performance in handling medical records, increase security standards, and safeguard patient privacy and confidentiality.

According to Flores, M. J. (2014) Diabetes Mellitus requires regular monitoring to effectively reduce the risk of complications and improve the life quality of the patient. As such, this system aims to simplify the monitoring process by providing users with functionalities to add, edit and view diabetic logs in a tabular and graphical manner. Additionally, this system also aims to bolster interaction between users through the forums and internal messaging system.

According to Abing, N. (2018) CareHub is a mobile-based medication management system; this mobile application offers faster access and response to medical transaction. This application provides on-line appointment scheduling like vaccination, check-up, immunization, and any other medical transactions, furthermore, it helps patients by reducing uncomfortable feeling when taking in line in hospitals or clinics when consulting a doctor, because waiting is a common phenomenon in the doctor’s waiting room. Software Engineering Methodology was utilized to come up with the final application. The CareHub application can be entered using a username and password. The interface is very user-friendly, CareHub also keeps track all the prescription receipt that has given to a doctor, because some people for-gotten their prescription receipt where they have been placed. In some circumstances, the patient also forgot to take their medicines. Due to these common problems, the researchers will develop a mobile application that solves this kind of problems like having a notification that will remind them to take or to be aware their health information like: taking their medicine at time and recording their prescription receipt.

According to Eileen Rose Quilon (2020) The designed system automates the management of patient records, particularly patient registration, monitoring, and history. The system was designed and developed using the Rapid Application Development (RAD) approach. To evaluate the system's needs and illustrate each data's relationship, various techniques were employed for data analysis. Furthermore, the following system requirements were identified: (1) the system's ability to register; (2) the system's security measures; (3) the system's ability to add, update, and delete records; (4) the system's ability to handle dispensing prescriptions; and (5) the system's ability to store and manage patient diagnostic tests and records; (6) The system's capacity to recommend appropriate food consumption; and (7) the system's ability to generate reports. The Automated Patient Information for the University of Northern Philippines Hospital should be implemented to the university hospital to help with the challenges that the existing system is experiencing. As a result, users of the system must be trained, and additional research should be conducted to assess the study's overall performance.

According to Zhou, F. (2020) Coronavirus disease 2019 (COVID-19) is a recently recognized irresistible sicknesses that has quickly spread all through the world with rising fatalities with assertion by World Health Organization as the pandemic. Online discussions have been displayed to ease the pandemic with our examination plans to determine if online interview can be an answer for intense wellbeing emergency. Review examination of the qualities of online interviews through two essential consideration online-counsel stages during COVID-19 pandemic was performed at the Third Affiliated Hospital of Sun Yat-Sen University, which drove the appraisal of COVID-19-side effects patients in Guangzhou. The 3473 online interviews were isolated into pre-pandemic and pandemic period bunches with Chi-square test as factual investigation strategy. The quantity of online meetings has expanded with determination of upper respiratory lot contamination, mental conditions, COVID-19-related examinations and mediations. The expanded online meetings fulfilled the expanded need of the applicable clinical administrations and diminished the staggering medical clinic introductions, subsequently diminishing the potential COVID-19 spread inside the significant tertiary medical clinic and saving the assets for intense emergency the board. The study of disease transmission and infection qualities of online discussions during the pandemic have been shown with distinguishing proof of the empowering elements and possible boundaries in working on online medical care in China with online interview model being a strong answer for pandemic in future.

According to De los Santos, G. (2019) The icare: Health Check-Up System is an online application center around the clinical administration of Eastern Visayas State University that will give a coordinated wellbeing examination framework for EVSU Medical. Further the icare application gives a simpler and quicker method of overseeing information and simple to-get to patients' clinical record, precise stock, just as the convenient clinical reports and information investigation that sum up the highest sickness and medications required in every division and courses. The Eastern Visayas State University (EVSU) Medical Clinic devours a ton of time in looking and making a rundown of the multitude of diseases and meds and surprisingly the stock of prescriptions in the facility. All through programming advancement strategy of the System Development Life Cycle (SDLC), the specialist utilizes the prototyping model which a model is planned dependent on the customer point of view, tried by the actual customer and afterward revamped more than once on a case-by-case basis until a fitting outcome is effectively accomplished from which the full framework or administration can be created. The review surveys and meet were used as the principal devices in the improvement of the application. Thus, a 100% rating was given to the icare application and presently executed and running on the web in the college which improves and gives bother free administrations to the customer and staff of the facility. The scientists execute and keep up with the perfection running of icare application that give bother free administrations and fulfill the requirements of the customer of EVSU Medical Clinic.

**CHAPTER III**

**Research Methodology**

This chapter presents research design, project design, software method, population and sampling technique, research instrument, data gathering procedure, and data analysis of the study.

**3.1. Research Design**

Clinic Management System for Philippine Christian University – Dasma is an automated system that used a descriptive research method. Descriptive research is defined as a research method that describes the characteristics of the population or phenomenon studied. This methodology focuses more on the “what” of the research subject than the “why” of the research subject. A descriptive research design was used because the study will focus on the development of web-based clinic management system based on the data gathered from Philippine Christian University – Dasma campus. through descriptive statistics it will analyze and presented the result of the survey which is used to describe and summarize the data.

**3.2. Project Design**

Health record

Summary reports

Login user ID

Clinic Management System for Philippine Christian University – Dasmariñas

Doctor/ Nurse

Students/ Employee

Input Data

*Figure 2: Context Diagram of Clinic Management System for*

*Philippine Christian University – Dasmariñas*

In Figure 2, there are two groups of users that can access the system with different roles. The first group is the enrolled students and employees of Philippine Christian University – Dasma, and the second group is the doctor and nurses of the campus clinic. All users need to login their user ID and password to be able to access the system. Students and employees will input the important information. The doctor and nurse are the only user that are allowed to add, edit and delete a data of the students/ employee health record. Using all the data provided by the users, the system will display a list of information and health records.

**3.3. Software Method**

System Requirements

Analysis

Design

Coding

Testing

Operations

*Figure 3: Modified Waterfall Model*

In Figure 3, it shows the modified waterfall model that emphasize a logical progression of steps in developing the clinic management system. The stages are system requirements, analysis, design, coding, testing and operations.

**System Requirements Stage.** In this stage, the researcher communicates with the client and explain the purpose of the system. To meet the requirements, the client also know the needs and wants for the system that will fit for their clinic before going to the next stage. For this stage, the researcher also needs to know the software requirements to finish the developed system.

**Analysis Stage.** In this stage, analyzes the requirements collected from the system requirements stage. Planning and analyzing precisely executed. The plan needs to be accomplished before managing it out to design and recognize the goals. In analyzing it should be matched to the system requirements that the client wants.

**Design Stage.** In this stage, the flow of how the developed system works were designed. It determines the process on how the clinic will use the developed system and how it will provide the needs of the users.

**Coding Stage.** In this stage, the design will be implemented to develop the clinic management system through coding using NetBeans, and storage and management of data using XAMPP Control Panel and phpMyAdmin. The programming languages used are HTML for content, CSS and JavaScript for design, and PHP for database access.

**Testing Stage.** In this stage, the functionality of the developed system will be tested by identifying and eliminating errors.

**Operations Stage.** In this stage, includes the deployment of the developed system to the client in which the site was published so that users can interact and evaluate the system.

**3.4. Population and Sampling Technique**

The study is non-probability of web-based evaluators. In this sampling design, the researchers selected the conveniently available system evaluators. The evaluators are consisted of 20 potential users, and 5 IT experts.

**Evaluators of the study**

The evaluators of the developed system were composed of 30 persons. Participants were selected using a fixed minimum quota of 25 respondents that met the following criteria:

Potential users were: (a) staff of Philippine Christian University – Dasma campus, (b) enrolled in high school and college programs.

IT experts were: (a) a graduate of Computer Science, Information Technology, Computer Engineering or any computer-related program, (b) working in the IT industry with job functions related to his field of study, and/or (c) teaching IT related subjects in his field of specialization.

**3.5. Research Instrument**

The study used W3C Web Assessment Tool as survey questionnaire for gathering the data. It is a list of questions used for data collection. This is tool is often used especially online surveys. It gave accurate interpretation from the interacted participants where the researcher’s analyzed qualitatively, using percentages, average or other statistical analysis to determine relationship. The respondents were given enough time to evaluate the Clinic Management System the researcher will be made.

The evaluators such as potential users and IT experts were requested to specify the degree of their agreement on the indicators by using a 5-point scale:

5 – Excellent (E). Indicated that the evaluators perceived that all functionalities of the developed system are working perfectly.

4 – Very Good (VG). Indicated that the evaluators perceived that all functionalities of the developed system are working.

3 – Good (G). Indicated that the evaluators perceived that all functionalities are working but need improvement.

2 – Fair (F). Indicated that the evaluators perceived that some of the functionalities need improvement.

1 – Poor (P). Indicated that the evaluators perceived that most of the functionalities need improvement.

**3.6. Data Gathering Procedure**

The following steps would be undertaken in the study:

1. The researchers made a consent letter for Philippine Christian University – Dasmarinas Campus to conduct a survey questionnaire.
2. After the confirmation, the researchers gave a survey questionnaire form via online to all the respondents.
3. After the questionnaire, the researchers designed and developed a system that will fit for the University wants and needs.
4. The researchers make a survey questionnaire for evaluation using Google Forms and it was distributed to the respondents accordingly. The researchers also provided a clear and concise objective to the respondents.
5. After the evaluation, the researchers gathered and collected the data to organized and did data analysis using descriptive statistics, specifically using mean, standard deviation, frequency and percentage in interpreting the results.

**3.7. Data Analysis**

The results of the survey were organized in a tabular form to prepare it for analysis. To process and interpret the data, statistical tools such as mean, standard deviation, frequency, and percentage were used in the study.

Mean – or more commonly known as average. The mean will be used to determine the degree of Potential user and IT expert’s respondents in the functional acceptability of the system. The formula for solving the mean is:

Where:

= sample mean

= sum of measurements

n = sample size

Standard Deviation – is a statistic that measures a dataset's dispersion from its mean. By calculating each data point's divergence from the mean, the standard deviation is calculated as the square root of variance. There is a bigger variance within the data set if the data points are further from the mean; consequently, the more spread out the data, the higher the standard deviation. The formula for solving the standard deviation is:

Where:

s = sample standard deviation

= sum of measurements

n = number of scores in sample

= sample mean

Frequency – is a graphic representation of the distribution of observations within a test. Frequency distribution is frequently used by analysts to depict or interpret the data obtained in a sample.

Percentage – is one of the most used ways to portray statistics. Percentage is denoted by the sign percent, which simply means "per hundred." One percent (or 1% ) is one hundredth of a total or whole number, and is computed by multiplying the total or whole number by 100. The formula for solving the percentage is:

Where:

P = percent

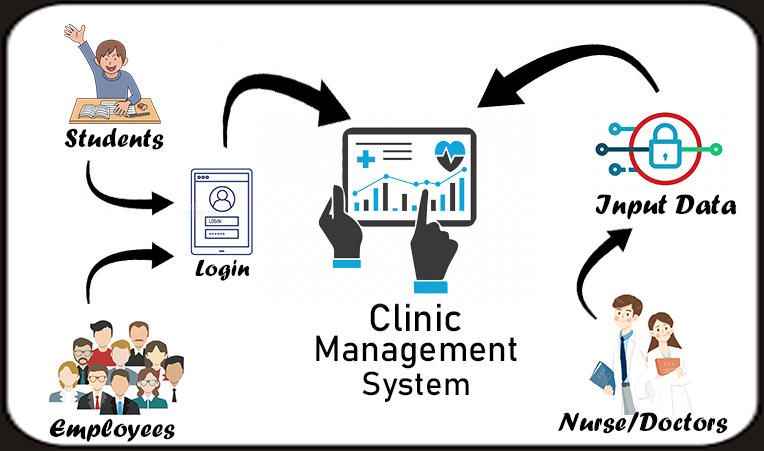
= sum of frequencies

f = number of frequencies

**CHAPTER IV**

**RESULTS AND DISCUSSIONS**

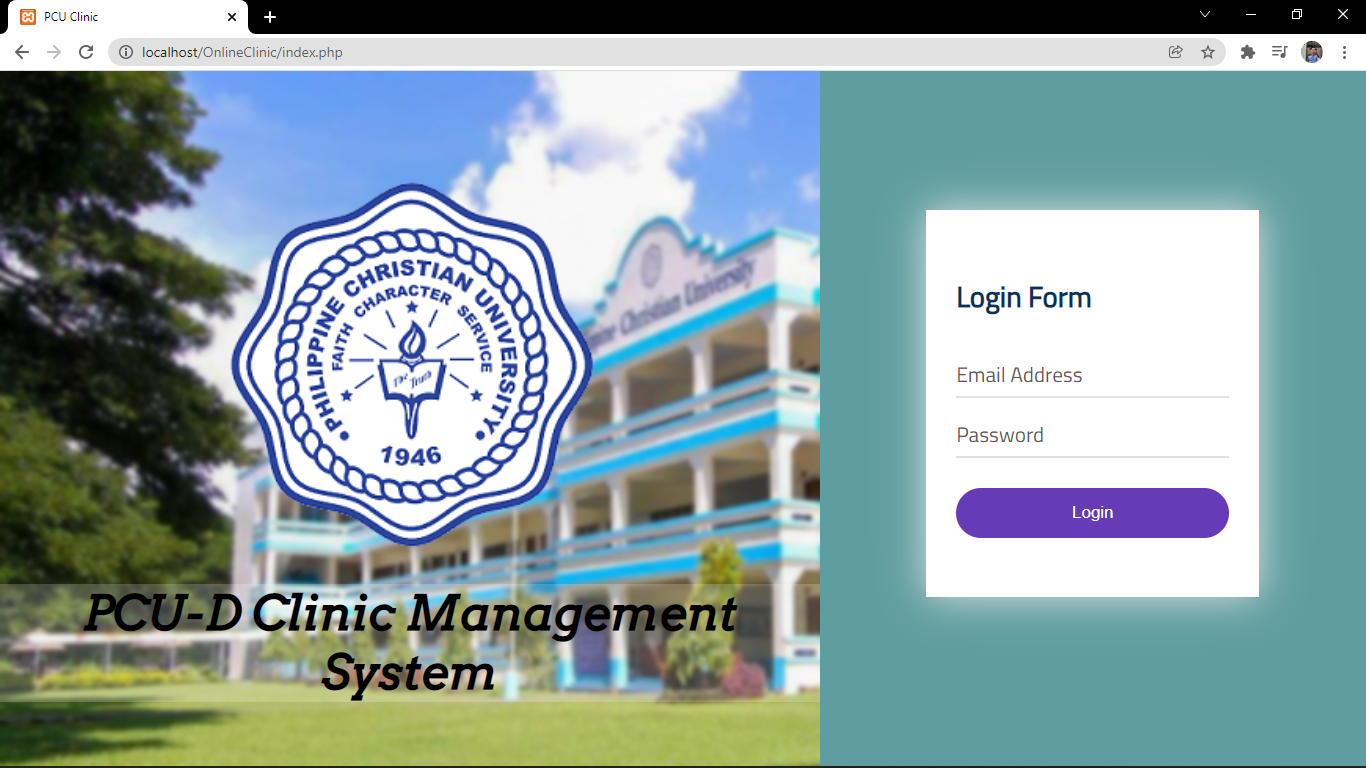
This chapter presents the data and findings gathered through the research instruments used in the study. The data analyzed and statistically treated in order to evaluate the interpretations of data that lead to the conclusions and recommendations of the study.

1. To design the Web-Based Clinic Management System for Philippine Christian University – Dasmariñas.

*Figure 4. Infographic Clinic Management System*

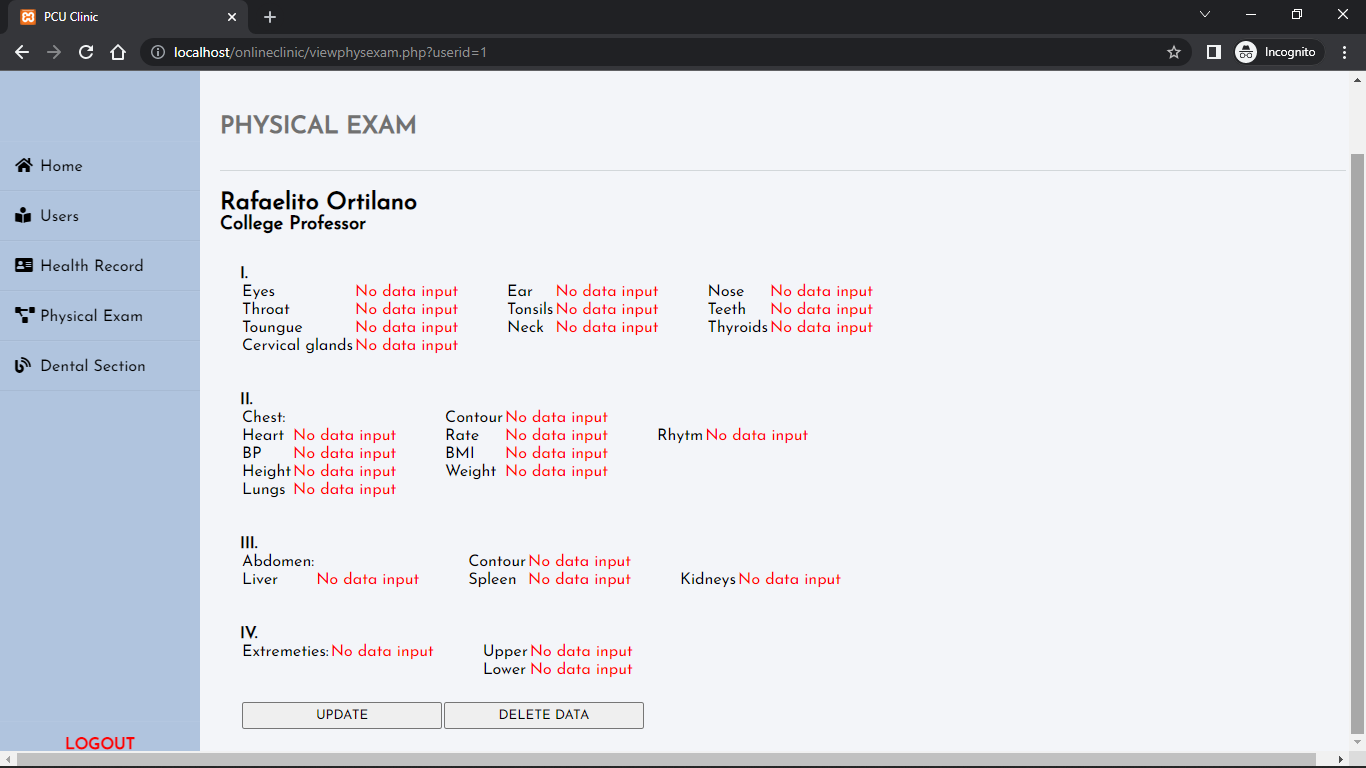
As shown in the Figure 4, the students, employees, nurses and doctors of PCU can gain access to the system using a desktop by entering their email and password. Once a user is enrolled or begins working at the institution, the IT Department will give the user with an email address and a password. After logging into the system, users can provide or fill up and update all the necessary personal information. Nurses and doctors, on the other hand, can acquire access to the system and enter data from the student's and employee's health records. As a result, the system will display the list of data that users can manage as well as a summary of reports which users can use for assessments. The summary of reports can be displayed in different sections of the system.

1. The development of Web-Based Clinic Management System for Philippine Christian University – Dasmariñas was created with the following features:

* Single login form for multiple users interferes
* Student sign in with his/her Name, Student ID/ Employee ID, Email Address, Grade Level, Course/Year/Section or Department, and Password
* Add, update and delete

*Figure 5. Single Login Form Screenshot of the System*

In figure 5, it shows the login form of the system. It’s a single login form for students, employees, nurses and doctors. Forgot password is not include in the login form because the email address and password was provided by the IT Department. As well as sign up form. Email address and password will be given once you enrolled and start working in institute.

According to Hennie Kruger (2014), passwords are one of the main mechanisms used to protect data and information, it is important to ensure that passwords are managed correctly and that factors which will have a significant impact on password management are identified and prioritized. Therefore, in order for an information and communication technology (ICT) overall security program to be successful, a security awareness program or component must be included.

*Figure 6. Add, Update and delete screenshot of the System*

In figure 6, it shows the data of the Physical Examination of the user that composes of an Update and Delete button in the developed Web-based Clinic Management System for Philippine Christian University – Dasmariñas. The first button is Update button, to use the update button to add physical examination of the specific user and to be fill up by the nurses or doctors of the university. And the second button is Delete button, his is used to remove all of the user's previously entered data.

By the help of this Button the clinic management system features provides an easily monitoring the data of the physical examination of the user. The button will help the clinic management system feature when adding, updating and deleting the data of the physical examination of the user.

According to Mrs. Walsh, Mrs. Hamilton, Mrs. White and Mrs. Hyde (2015), the usage of the internet to access information is fast growing; nevertheless, the quality of health information available on numerous websites is debatable. The goal of this study was to look at the underlying reasons that influence parents' decisions to use online information to manage their children's health care, a behavior that has yet to be thoroughly investigated.

1. To access the acceptance functionality if the developed web-based clinic management system for Philippine Christian University – Dasmariñas.

The developed system was assessed by 30 evaluators. The instrument was based on ISO 25010-1 standard for systems and software quality requirement and evaluation.

Table 1. Sex of the system evaluators

|  |  |  |
| --- | --- | --- |
| **Sex** | **Frequency** | **Percentage** |
| Male | 16 | 53.33% |
| Female | 14 | 46.67% |
| **Total** | 30 | 100% |

In terms of sex, Table 1 shows the profile o management system evaluators in which 16 are male with a higher percentage of 53.33% than females with a frequency of 14 and a percentage of 46.67%.

Table 2. Category of the system evaluators

|  |  |  |
| --- | --- | --- |
| **Category** | **Frequency** | **Percentage** |
| Potential Users | 27 | 90% |
| IT Experts | 3 | 10% |
| **Total** | 30 | 100% |

As seen in Table 2, the category of management system evaluators is presented in which the majority belong to potential users with a frequency of 27 and a percentage of 90%. And only three IT experts with a percentage of 10% have evaluated.

Table 3. Functionality of Clinic Management System for Philippine Christian University – Dasmariñas

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicator** | **Mean** | **SD** | **VI** |
| Completeness | 1.5333 | 0.6814 | Excellent |
| Correctness | 1.5000 | 0.6297 | Excellent |
| Appropriateness | 1.3333 | 0.5467 | Excellent |
| **Composite Score** | **1.4555** | **0.6193** | **Excellent** |

*Legend: SD – Standard Deviation; VI – Verbal Interpretation*

*Scale: 2.20 - 1.00 Excellent, 3.40 - 2.19 Very Good, 4.60 - 3.39 Good,*

*5.80 - 4.59 Fair, 5.00 - 5.79 Poor*

Table 3 shows that the Functional Sustainability of the Developmental of LAN-based Billing and Inventory Management System for G. Alas Wood Works obtained a composite mean score of 1.4555 with a standard deviation of 0.6193 and a verbal interpretation of Excellent. The highest mean score in terms of Functional Sustainability is Appropriateness with obtained mean score of 1.3333, with standard deviation of 0.5467 and with verbal interpretation of Excellent. The lowest mean score in terms of Functional Sustainability is Completeness with obtained mean score of 1.5333, with standard deviation of 0.6814 and with verbal interpretation of Excellent.

This indicates that the developed Clinic Management System for Philippine Christian University – Dasmariñas meets the standards on functionality completeness, correctness and appropriateness for it to get an adjectival rating of Excellent from system evaluators. The reason for this is that its main functionalities, such as creating, reading, updating and deleting of data. Therefore, it meets the requirements of system evaluators in terms of functional suitability.

According to Susan Brien (April 2014), research and related activity pertaining to functionality appropriateness from a management system perspective, and it serves as a useful resource for both supporting evidence-based decision-making and guiding future appropriateness research.

Table 4. Efficiency of Clinic Management System for Philippine Christian University – Dasmariñas

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicator** | **Mean** | **SD** | **VI** |
| Time Behavior | 1.3667 | 0.5561 | Excellent |
| Resource Utilization | 1.3000 | 0.4661 | Excellent |
| Capacity | 1.4333 | 0.6789 | Excellent |
| **Composite Score** | **1.3666** | **0.5670** | **Excellent** |

*Legend: SD – Standard Deviation; VI – Verbal Interpretation*

*Scale: 2.20 - 1.00 Excellent, 3.40 - 2.19 Very Good, 4.60 - 3.39 Good,*

*5.80 - 4.59 Fair, 5.00 - 5.79 Poor*

As shown in Table 4, the performance efficiency of Clinic Management System for Philippine Christian University – Dasmariñas which obtained a composite score of 1.3666 with a standard deviation of 0.5670 and a verbal interpretation of Excellent. Resource utilization had the highest mean score of 1.3000, with a standard deviation of 0.4661, and verbal interpretation of Excellent. On the other hand, in terms of performance efficiency, Capacity got the lowest mean score of 4.4651 with a verbal interpretation of Excellent and a standard deviation of 0.6789.

It means that the developed of Clinic Management System for Philippine Christian University – Dasmariñas followed the standards on time behavior, resource utilization and capacity for it to get an adjectival rating of Excellent across the two groups of system evaluators in terms of performance efficiency. As a result, the performance of the system achieved the requirements and goals that the user wants.

According to Jensen J (2004), Despite significant technological advancements, too many nurses still rely on the phone-page-whiteboard communication system to keep track of patient status. From the emergency department to admissions and the inpatient area, United Hospital installed an automated patient-flow management system throughout the large metropolitan hospital. The organization was compelled to automate patient tracking due to a number of pressing issues. The organization improved nurse, physician, staff, and family satisfaction by implementing this system, which resulted in better capacity utilization, lower divert rates, increased efficiency and productivity, and improved nurse, physician, staff, and family satisfaction.

Table 5. Compatibility of Clinic Management System for Philippine Christian University – Dasmariñas

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicator** | **Mean** | **SD** | **VI** |
| Co-existence | 1.5667 | 0.6789 | Excellent |
| Interoperability | 1.4000 | 0.6215 | Excellent |
| **Composite Score** | **1.4834** | **0.6502** | **Excellent** |

*Legend: SD – Standard Deviation; VI – Verbal Interpretation*

*Scale: 2.20 - 1.00 Excellent, 3.40 - 2.19 Very Good, 4.60 - 3.39 Good,*

*5.80 - 4.59 Fair, 5.00 - 5.79 Poor*

Table 5 shows that the compatibility of Clinic Management System for Philippine Christian University – Dasmariñas obtained a composite score of 1.4834 with a standard deviation of 0.6502 and a verbal interpretation of Excellent. The highest mean score is Interoperability with obtained mean score of 1.4000, with a standard deviation of 0.6215 and with a verbal interpretation of Excellent in terms of compatibility. The lowest mean score in terms of compatibility is Co-existence with obtained mean score of 1.5667, with a standard deviation of 0.6789, and with a verbal interpretation of Excellent.

This means that the developed system of Clinic Management System for Philippine Christian University – Dasmariñas followed the standards on co-existence and interoperability, for it to get an adjectival rating of Excellent from system evaluators in terms of Compatibility. It is due to the absence of errors and unnecessary impact on other products, software and resources in the same environment during the evaluation. The developed system meets the requirements of system evaluators in terms of compatibility.

According to Sandor Munk (2002), Interoperability in the infosphere is becoming a more important requirement for information superiority. Information interoperability is not a stand-alone concept; it must be discussed as part of a larger (operational) interoperability framework. We examine definitions of basic interoperability terms and propose a broad definition of interoperability in this paper. Then we look at how interoperability relates to concepts like compatibility, interchangeability, and commonality, demonstrating that these are not levels of interoperability, but rather important characteristics that are strongly linked to it. Finally, we present a system model of interoperability types, explaining the concept of functional area interoperability and the roles of information and technical interoperability.

Table 6. Usability of Clinic Management System for Philippine Christian University – Dasmariñas

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicator** | **Mean** | **SD** | **VI** |
| Appropriateness Recognizability | 1.2333 | 0.4302 | Excellent |
| Learnability | 1.2333 | 0.5040 | Excellent |
| Operability | 1.4333 | 0.6789 | Excellent |
| User Error Protection | 1.3333 | 0.4795 | Excellent |
| User Interface Aesthetics | 1.4667 | 0.6814 | Excellent |
| Accessibility | 1.3333 | 0.5467 | Excellent |
| **Composite Score** | **1.3389** | **0.5535** | **Excellent** |

*Legend: SD – Standard Deviation; VI – Verbal Interpretation*

*Scale: 2.20 - 1.00 Excellent, 3.40 - 2.19 Very Good, 4.60 - 3.39 Good,*

*5.80 - 4.59 Fair, 5.00 - 5.79 Poor*

Table 6 shows that the usability of the developed system of Clinic Management System for Philippine Christian University – Dasmariñas obtained a composite mean score of 1.3389 with standard deviation of 0.5535 and verbal interpretation of Excellent. The highest mean score in terms of usability is Appropriateness Recognizability and Learnability with obtained mean score of 1.2333. Appropriateness Recognizability standard deviation is 0.4302 while the standard deviation of Learnability is 0.5040. Both Appropriateness Recognizability and Learnability’s verbal interpretation is Excellent. The lowest mean score in terms of usability is User Interface Aesthetics with standard deviation of 0.6814 and with a verbal interpretation of Excellent.

This means that the developed system of Clinic Management System for Philippine Christian University – Dasmariñas followed the standards on Appropriateness Recognizability, Learnability, Operability, User Error Protection, User Interface Aesthetics and Accessibility for it to get an adjectival rating of Excellent from system evaluators in terms of Usability. The purpose of usability was to navigate the things that are required in the system. It clearly presents the information and guarantee the systems requirements.

According to Jakob Nielsen (January 2012), Usability is a requirement for survival on the Internet. People will abandon a website if it is difficult to use. People leave if the homepage does not clearly state what a company offers and what users can do on the site. When users become disoriented on a website, they abandon it. Users will leave a website if the information is difficult to read or does not answer their key questions. Is there a pattern emerging here? There is no such thing as a user reading a website manual or wasting time trying to figure out how to use an interface. There are a plethora of other websites to choose from; when users encounter a problem, the first line of defense is to leave.

Table 7. Reliability of Clinic Management System for Philippine Christian University – Dasmariñas

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicator** | **Mean** | **SD** | **VI** |
| Maturity | 1.3000 | 0.4661 | Excellent |
| Availability | 1.3333 | 0.4795 | Excellent |
| Fault Tolerance | 1.4667 | 0.6288 | Excellent |
| Recoverability | 1.4667 | 0.6288 | Excellent |
| **Composite Score** | **1.3917** | **0.5508** | **Excellent** |

*Legend: SD – Standard Deviation; VI – Verbal Interpretation*

*Scale: 2.20 - 1.00 Excellent, 3.40 - 2.19 Very Good, 4.60 - 3.39 Good,*

*5.80 - 4.59 Fair, 5.00 - 5.79 Poor*

As shown in Table 7, the developed system of Clinic Management System for Philippine Christian University – Dasmariñas obtained a composite mean score of 1.3917 with a standard deviation of 0.5508 and a verbal interpretation of Excellent. The highest mean score is Maturity with obtained mean score of 1.3000, with a standard deviation of 0.4661 and a verbal interpretation of Excellent in terms of Reliability. The lowest mean scores are Fault Tolerance and Recoverability with 1.4667 mean score in terms of Reliability. Bot Fault Tolerance and Recoverability got a standard deviation of 0.6288 and a verbal interpretation of Excellent.

This means that the developed system adhered to the standards on maturity, availability, fault tolerance, and recoverability for it to get an adjectival rating of Excellent form system evaluators. In addition, its ability to perform specified functions under specified conditions for a specified period of time satisfies their needs. It is always available to users who have an Internet connection.

According to Alfredo Garro, Andrea Tundis (2012), system Reliability is a critical non-functional requirement that must be met even for mission-critical systems. Traditional techniques, which are primarily based on statistical and probabilistic tools and the hierarchical decomposition of the system in terms of its components, are often insufficient due to the increase in both system complexity and accuracy required in reliability analyses. Furthermore, because integrating classical techniques into typical system development processes, particularly during the design phases, is difficult, their use is frequently deferred to later stages of development (e.g., system verification), with the risk of having to revise even basic design decisions, resulting in an increase in both completion time and development cost.

Table 8. Security of Clinic Management System for Philippine Christian University – Dasmariñas

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicator** | **Mean** | **SD** | **VI** |
| Confidentiality | 1.2667 | 0.5833 | Excellent |
| Integrity | 1.3000 | 0.5350 | Excellent |
| Non-repudiation | 1.3667 | 0.5561 | Excellent |
| Accountability | 1.3333 | 0.5467 | Excellent |
| Authenticity | 1.3000 | 0.5350 | Excellent |
| **Composite Score** | **1.3133** | **0.5512** | **Excellent** |

*Legend: SD – Standard Deviation; VI – Verbal Interpretation*

*Scale: 2.20 - 1.00 Excellent, 3.40 - 2.19 Very Good, 4.60 - 3.39 Good,*

*5.80 - 4.59 Fair, 5.00 - 5.79 Poor*

Table 8 shows that the developed system of Clinic Management System for Philippine Christian University – Dasmariñas obtained a composite mean score of 1.3133 with a standard deviation of 0.5512 and a verbal interpretation of Excellent in terms of Security. The highest mean score is Confidentiality with obtained mean score of 1.2667, with a standard deviation of 0.5833 and a verbal interpretation of Excellent. The lowest mean score is Non-repudiation with obtained mean score of 1.3667, with a standard deviation of 0.5561 and a verbal interpretation of Excellent.

This implies that the developed system followed the standards on confidentiality, integrity, non-repudiation, and accountability for it to get an adjectival rating of Excellent from system evaluators. Given that it protects information and data, it allows users to have the level of data access that is appropriate for their types and levels of authorization. Therefore, it meets the requirements of system evaluators in terms of security.

According to Julia Dutton (August 2021), a certified Information Security Management System or ISMS, independently audited by an approved certification body, can provide customers and potential clients with the necessary reassurance that the organization has taken the necessary steps to protect their information assets from a variety of identified risks. The robustness of the information security risk assessment, which is critical to any implementation, determines the strength of an ISMS. Recognizing the full range of risks that the organization and its data may face in the near future is a prerequisite for implementing necessary mitigating measures.

Table 9. Maintainability of Clinic Management System for Philippine Christian University – Dasmariñas

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicator** | **Mean** | **SD** | **VI** |
| Modularity | 1.3000 | 0.4661 | Excellent |
| Reusability | 1.3000 | 0.5350 | Excellent |
| Analysability | 1.4667 | 0.6288 | Excellent |
| Modifiability | 1.3667 | 0.5561 | Excellent |
| Testability | 1.4000 | 0.5632 | Excellent |
| **Composite Score** | **1.3667** | **0.5500** | **Excellent** |

*Legend: SD – Standard Deviation; VI – Verbal Interpretation*

*Scale: 2.20 - 1.00 Excellent, 3.40 - 2.19 Very Good, 4.60 - 3.39 Good,*

*5.80 - 4.59 Fair, 5.00 - 5.79 Poor*

Table 9 shows the maintainability of the developed system of Clinic Management System for Philippine Christian University – Dasmariñas, which obtained a composite mean score of 1.3667 with a standard deviation of 0.5500 and a verbal interpretation of Excellent. Modularity and Reusability have the highest mean score of 1.3000 in terms of Maintainability. Modularity had a standard deviation of 0.4661 and a verbal interpretation of Excellent. On the other hand, Reusability had a standard deviation of 0.5350 and a verbal interpretation of Excellent. On the contrary, Analysability acquired the lowest mean score of 1.4667 with a standard deviation of 0.6288 and a verbal interpretation of Excellent.

This implies that the developed system of Clinic Management System for Philippine Christian University – Dasmariñas followed the standards on modularity, reusability, analysability, modifiability, and testability for it to get an adjectival rating of Excellent from system evaluators. This may be due to the fact that it can be modified for improvement, correction, and adaptation to changing environments and requirements. Therefore, the degree of efficiency and effectiveness when it comes to maintainability satisfies the requirements of system evaluators.

According to Ruchika Malhotra, Anuradha Chug (October 2016), Software maintenance is a costly activity that accounts for a significant portion of the total project cost. Maintenance activities include the addition of new features, the deletion of obsolete code, the correction of errors, and so on. The ease with which these operations can be performed is referred to as software maintainability. When maintainability is assessed early in the software development process, it aids in better planning and resource allocation. Using prediction models, we can often derive the corresponding maintainability by measuring design properties such as coupling, cohesion, and so on early in the development process.

Table 10. Portability of Clinic Management System for Philippine Christian University – Dasmariñas

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicator** | **Mean** | **SD** | **VI** |
| Adaptability | 1.3667 | 0.5561 | Excellent |
| Installability | 1.4000 | 0.5632 | Excellent |
| Replaceability | 1.4667 | 0.6288 | Excellent |
| **Composite Score** | **1.4111** | **0.5827** | **Excellent** |

*Legend: SD – Standard Deviation; VI – Verbal Interpretation*

*Scale: 2.20 - 1.00 Excellent, 3.40 - 2.19 Very Good, 4.60 - 3.39 Good,*

*5.80 - 4.59 Fair, 5.00 - 5.79 Poor*

As shown in Table 10, the Portability the developed system of Clinic Management System for Philippine Christian University – Dasmariñas obtained a composite mean score of 1.4111 with a standard deviation of 0.5827 and a verbal interpretation of Excellent. The highest mean score in terms of portability is Adaptability which obtained a mean score of 1.3667, with a standard deviation of 0.5561 and a verbal interpretation of Excellent. On the other hand, Replaceability got the lowest mean score of 1.4667 with a standard deviation of 0.6288 and a verbal interpretation of Excellent.

This implies that the developed system of Clinic Management System for Philippine Christian University – Dasmariñas followed the standards on adaptability, installability, and replaceability for it to get an adjectival rating of Excellent from system evaluators. The level of effectiveness and efficiency with which the system can be transferred from one hardware, software or other operational or usage environment to another satisfies their requirements in terms of Portability. Therefore, it does not need installation in a specified environment to be used.

According to Dan Barrett (March 2020), as new versions progress through the lifecycle, software that requires a lot of environment-related configuration and tuning will cost time and effort. For anyone involved in moving new versions of software across environments, portability saves time and mental effort. Building portable software actually encourages patterns that support a slew of other beneficial characteristics. It follows that if you make it easier to run your software here or there, it will be easier to run it there: supporting replication within and across environments, and allowing engineers across teams and orgs to run the software themselves. Similarly, an application with full portability and ease of use for developers is easier to build on top of: a highly portable application lends itself to great extensibility.

Table 11. Overall evaluation result of Clinic Management System for Philippine Christian University – Dasmariñas

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicator** | **Mean** | **SD** | **VI** |
| Functional Suitability | 1.4555 | 0.6193 | Excellent |
| Performance Efficiency | 1.3666 | 0.5670 | Excellent |
| Compatibility | 1.4834 | 0.6502 | Excellent |
| Usability | 1.3389 | 0.5535 | Excellent |
| Reliability | 1.3917 | 0.5508 | Excellent |
| Security | 1.3133 | 0.5512 | Excellent |
| Maintainability | 1.3667 | 0.5500 | Excellent |
| Portability | 1.4111 | 0.5827 | Excellent |
| **Overall Mean** | **1.3909** | **0.5781** | **Excellent** |

*Legend: SD – Standard Deviation; VI – Verbal Interpretation*

*Scale: 2.20 - 1.00 Excellent, 3.40 - 2.19 Very Good, 4.60 - 3.39 Good,*

*5.80 - 4.59 Fair, 5.00 - 5.79 Poor*

Table 11 shows that the overall evaluation result of the developed system of Clinic Management System for Philippine Christian University – Dasmariñas which obtained a composite mean score of 1.3909 with a standard deviation of 0.5781 and a verbal interpretation of Excellent. Security acquired the highest mean score of 1.3133, with a standard deviation of 0.5512, and a verbal interpretation of Excellent. On the other hand, Compatibility got the lowest mean score of 1.4834 with a standard deviation of 0.6502 and a verbal interpretation of Excellent.

The results imply that the developed system of Clinic Management System for Philippine Christian University – Dasmariñas followed the standards on Functional Sustainability, Performance Efficiency, Compatibility, Usability, Reliability, Security, Maintainability and Portability for it to get an adjectival rating of Excellent from system evaluators in terms of overall evaluation result.

Security represents the degree to which a product or system protects information and data so that persons or other products or systems have the degree of data access appropriate to their types and levels of authorization (ISO 25000 STANDARDS). ISO 25000 STANDARDS also mentioned that this characteristic is composed of the following sub-characteristics: Confidentiality - Degree to which a product or system ensures that data are accessible only to those authorized to have access. Integrity - Degree to which a system, product or component prevents unauthorized access to, or modification of, computer programs or data. Non-repudiation - Degree to which actions or events can be proven to have taken place so that the events or actions cannot be repudiated later. Accountability - Degree to which the actions of an entity can be traced uniquely to the entity. Authenticity - Degree to which the identity of a subject or resource can be proved to be the one claimed.

According to Junaid Rehman (May 2019), security is crucial in any type of organization. The company must keep a close eye on his vital information. The concept of security management revolves around preventing unauthorized access to company data. Nowadays, every individual or business stores their data electronically. It doesn't matter if it's a bank, an online store, an airline, or another company. An organization educates its employees on how to protect themselves from hackers. One of the most important things an organization can do is install anti-virus software on each computer and use a computer firewall to protect third-party access. A firewall prevents unauthorized apps from accessing a user's computer.

**CHAPTER V**

**Summary of Finding, Conclusion, Recommendations**

This chapter discusses the summary of findings from the developed system of Clinic Management System for Philippine Christian University – Dasmariñas. The conclusion derived from the findings and recommendations based on the results and discussion in Chapter 4.

**Summary of Findings**

The following summarizes the answers to the problems as stated in Chapter 1.

1. To design a Clinic Management System for Campus Clinic with two users interfere.

The developed system of Clinic Management System for Philippine Christian University – Dasmariñas was designed based on the Modified Waterfall Model which encompasses the phases of system requirement, analysis, design, coding, testing, and operation stage.

1. The Clinic Management System for Philippine Christian University – Dasmarinas Campus was created with the following features:

* Single login form for multiple users interferes
* Generate individual health record of user
* Add, update and delete

The Clinic Management System for Philippine Christian University – Dasmariñas was developed using Netbeans IDE 8.2 and XAMPP Control Panel. The main functionality of the Clinic Management System is single login form for multiple types of users; generate individual health record of the user; and system features such as add, update and delete of data.

1. The Clinic Management System was evaluated by 30 persons composed of potential users and IT experts.
   1. Functional Suitability

The evaluation of the Clinic Management System for Philippine Christian University – Dasmariñas obtained a mean of 1.4555 with a verbal interpretation of Excellent.

* 1. Performance Efficiency

The evaluation of the Clinic Management System for Philippine Christian University – Dasmariñas obtained a mean of 1.3666 with a verbal interpretation of Excellent.

* 1. Compatibility

The evaluation of the Clinic Management System for Philippine Christian University – Dasmariñas obtained a mean of 1.4834 with a verbal interpretation of Excellent.

* 1. Usability

The evaluation of the Clinic Management System for Philippine Christian University – Dasmariñas obtained a mean of 1.3389 with a verbal interpretation of Excellent.

* 1. Reliability

The evaluation of the Clinic Management System for Philippine Christian University – Dasmariñas obtained a mean of 1.3917 with a verbal interpretation of Excellent.

* 1. Security

The evaluation of the Clinic Management System for Philippine Christian University – Dasmariñas obtained a mean of 1.3133 with a verbal interpretation of Excellent.

* 1. Maintainability

The evaluation of the Clinic Management System for Philippine Christian University – Dasmariñas obtained a mean of 1.3667 with a verbal interpretation of Excellent.

* 1. Portability

The evaluation of the Clinic Management System for Philippine Christian University – Dasmariñas obtained a mean of 1.4111 with a verbal interpretation of Excellent.

* 1. Overall Result

The evaluation of the Clinic Management System for Philippine Christian University – Dasmariñas obtained a mean of 1.3909 with a verbal interpretation of Excellent.

**Conclusion**

The study was conducted to provide a Clinic Management System for Philippine Christian University – Dasmariñas that will simplify decision-making by consolidating all necessary data for reporting their performance. The researcher developed system provided a security, easy to understand interface, and organized health record for each user. The result of the overall mean from the evaluation of the system was Excellent from the system evaluators. The result proved that the system has been successfully constructed as designed.

Implementing the developed system will improve the institute of data and information that belong to the institute. The data of health record and information of the user will be secured and organize. The system helps in terms of operational and repetitive tasks became less burden and makes the work easier to gather the health record and information of the user for the nurses and doctors. The developed system entitled Clinic Management System has lead the users at ease without any concern and all the buttons functions as intended to. It is more reliable and provide better security in the system.

**Recommendation**

Based on the findings and conclusion of the study the following recommendations are offered:

1. Add gridlines in Physical Examination section
2. Enlarge the spacing in Physical Examination
3. Keep the developed system more reliable
4. Less interaction of the developed system