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Bulihan, City of Malolos, Bulacan



**BACHELOR OF SCIENCE IN INFORMATION SYSTEMS**

## **Enhancing Healthcare Access: A Dental Clinic Appointment System**

A System Design Presented to the

Bachelor of Science in Information Systems Department

Bulacan Polytechnic College

Bulihan, City of Malolos, Bulacan

In Partial Fulfillment of the requirements in

CAPSTONE PROJECT (IS-CAPS 423)

By:

Baltazar, Sofia Angela B.

Reyes, Dean Christian

Dollesin, Amerson

Manalo, Riana L.

Thesis Adviser:

Dr. Rosemarie S. Guirre

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### **CHAPTER 1**

#### **INTRODUCTION**

##### **A. PROJECT CONTEXT**

Nowadays, effective healthcare delivery is contingent on several factors, but one of the most crucial is the ability to schedule appointments efficiently. Ensuring that patients receive the care they need in a timely and convenient manner is essential for improving health outcomes and overall patient satisfaction. Research has shown that patients who can secure timely appointments are more likely to adhere to treatment plans and experience better health outcomes overall (Finaldi, 2023).

Moreover, clients are usually searching for the simplest choice when scheduling an appointment. By allowing the client to schedule appointments online, you give them the flexibility to choose the way that works best for them. Clients who work or have other obligations throughout the day may find it difficult to call and book an appointment during typical business hours. Clients may book open appointments using online scheduling (Patient Pop, 2022).

Consequently, for anyone who needs to keep track of all daily meetings, such as dentists, clinic staff, and others, this online web software is helpful for time management. The stress of appointment scheduling, which can be either dynamic or



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static in clinics, can be removed with the help of an efficient online system. By doing this, everyone involved in the scheduling process would benefit. Administrators and employees can carry out their duties more efficiently and successfully (Doshi S., et al., 2022).

Maintaining a balance between patient satisfaction and the allocation of limited healthcare resources is crucial given the rising demand for outpatient care. This situation has significant social and economic advantages. Consequently, clinics and hospitals use the appointment scheduling (AS) system, and research on optimizing its functioning is important (Niu et al., 2023). For instance, numerous scientific research has shifted their focus to the aspects that influence patient satisfaction with healthcare provider services. Ensuring the quality of services offered is crucial to meeting the requirements and expectations of patients (Marques et al., 2023).

Patients who walked in unexpectedly used to schedule appointments at outpatient services. Long waits in line for services are one of the main problems of using this old approach. A study reveals that the biggest challenge to patients' compliance with medical follow-up is an inconvenient appointment scheduling system. With the advent of information technology and its growing use, especially in the field of health, many outpatient centers use appointment systems. These systems are designed to provide better services and speed up the workflow. An efficient appointment system can reduce waiting time, increase patient satisfaction, and save resources (Bagheri et al., 2022).



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### **B. PURPOSE AND DESCRIPTION**

#### **STATUS OF CURRENT SYSTEM**

According to an exclusive interview with Doctor L. B. De Guzman owner of the clinic. They are currently using a manual method that is commonly time-consuming and ineffective for scheduling appointments and maintaining dental records for their patients. The clinic's staff and Doctors are struggling on their daily operations using the traditional system. Since, transactions are normally first come first served basis (walk in if preferred), and patients are required to contact the clinic prior making appointments. As a result, few patients receive treatment each day due to patient and dental staff discrepancies, incomplete patient records, and scheduling conflicts.

#### **REPLACING OF THE CURRENT SYSTEM**

The researchers seek to replace the existing system used by Doctor L. B. De Guzman with Enhancing Healthcare Access: A Dental Clinic Appointment System for L. B. De Guzman Clinic, which will improve record-keeping, aims to reduce the amount of paper-based transactions, efforts, and patient waiting time on getting scheduled appointments.



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### **OBJECTIVES**

A study reveals that the biggest challenge to patients' compliance with medical follow-up is an inconvenient appointment scheduling system. Thus, an efficient appointment system can reduce waiting time, increase patient satisfaction, and save resources (Bagheri et al., 2022).

The study helped develop a solution for the issue at the dental facility. The "Enhancing Healthcare Access: A Dental Clinic Appointment System" a web-based system made for the owner of Doctor L. B. De Guzman, Maunlad Menzyland Malolos Bulacan was developed by the researchers as a solution to this problem. Hence, some users occasionally seek greater operational management as an outcome of poor service. As a result, this research study has been made to address patient dilemmas about waiting times, online appointment scheduling systems, expectations, and improving the quality of treatments offered; not to mention a larger emphasis on patient satisfaction. Additionally, this system is designed to meet the needs of the dental clinic, making it smooth and simpler to operate daily. Thus, the system can ensure the accuracy, efficiency, reliability, security and user-friendliness of conducting the business.



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### **STATEMENT OF THE PROBLEM**

The general problem of the study is to determine the accuracy, efficiency, reliability, security and user-friendliness of Enhancing Healthcare Access: A Dental Clinic Appointment System. The following problems include:

1. How can the proposed system manage the effectiveness of patient records?
2. How can the proposed system improve the appointment process?
3. How can the proposed system be evaluated based on the following criteria: functional suitability, performance efficiency, usability, reliability, security, maintainability, compatibility and portability?

### **GENERAL PROBLEM**

Researchers generated Five (5) questions that is important to consider in developing the system, which are the following:

- 1) How might the suggested system assist the Doctor L. B. Does Guzman run more smoothly on a daily basis?
- 2) How could the system speed up Doctor L. B. De Guzman daily operational procedures?
- 3) What are the basic features of the proposed plan?
- 4) How well does it address the clinic wait time and daily operation issues?



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- 5) How well-suited is Enhancing Healthcare Access: A Dental Clinic Appointment System in terms of ISO/IEC 25010 such as accuracy, efficiency, reliability, security, and user-friendliness?

### **SCOPE AND LIMITATION OF THE STUDY**

The scope of the system are the following; (1) The developed system is intended for the Dental Clinics in Bulacan. (2) Only the Super Admin can see and modify patient records. (3) Admin on-the-other-hand has limited access to the system. (4) The developed system can also receive documents or requirements for the purposes of a paperless office. (5) Administrator will provide notification on the patient's account if they approved, declined or missed requirements. Meanwhile the limitations of the system are the following; (1) The method that has been designed is just for dental appointments; walk-in applications can also be completed in person. (2) The research may not apply to other systems or contexts because its scope is restricted to a specific online dental appointment system. (3) Poor internet access can make it difficult for administrators or patients to use the online platform, and the system could not work at all without it.

### **SIGNIFICANCE OF THE STUDY**

The following people, in particular, find the current study to be significant.



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**Clinic Owner** - The dentist at this clinic, who is also the owner, has an advantage over other clinics in terms of using advanced technology and having an organized, straightforward, but efficient online appointment and keeping records system.

**Clinic Dentist** – Dentists will be able to manage patient appointments and records in an effective and orderly manner with the help of the proposed system, enabling them to concentrate more on giving high-quality care. The online platform will also make it simple to obtain current patient information, enhancing the precision of diagnosis and treatment regimens.

**Clinic Staff** – The system will spare admins and staff members' time and effort by optimizing the management of duties like patient record-keeping and appointment scheduling. This will increase the clinic's overall effectiveness and free up admins to concentrate on other crucial activities.

**Patients** - The study will be beneficial to the patient since it can be deployed online, making it simple to access online viewing services, and because it can be scheduled quickly and safely from any web-connected device with an internet connection.

**Future Researcher** - Future scholars who want to create comparable systems or enhance the ones that already exist will find this study to be a very useful resource. A secure and effective Optimizing Healthcare Access and Service Quality through a Clinic





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Monitoring System will be designed and implemented with the help of the study's findings, which will also have an impact on the larger healthcare sector.

**The Researchers** - Researchers could benefit from access to comprehensive data, collaboration opportunities, funding support, publication avenues, adherence to ethical guidelines, access to advanced technology and tools, mentorship, and training in research methods and communication skills.

### **DEFINITION OF TERMS**

This project will be available in any technology such as mobile phones, laptops, and computers to run the system. In developing the project, the following technology tools will be used:

**INPUT-PROCESS-OUTPUT (IPO)** – A straightforward yet effective framework for comprehending how systems function and interact with its surroundings. It is frequently used to build, assess, and optimize systems in a variety of domains, including business analysis, engineering, and software development.

**BOOTSTRAP** – is a special feature used by the developer for designing and making the overall system presentably looking.



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**PHP** – is considered the backbone of the system. Wherein developer uses this language to create the system

**MySQL** – will serve as the system's database management. The developer will use MySQL store and secure data and information.

**HTML** – is the code that is used by the programmer to structure the webpage and the system's content.

### **C. OBJECTIVES**

#### **GENERAL OBJECTIVES OF THE PROJECT**

In addition to a greater focus on Enhancing Healthcare Access: A Dental Appointment System, this research project has been designed to address patient dilemmas on waiting times, appointment scheduling systems, expectations, delays in daily operations and increasing the quality of treatments provided. The needs of the dental clinic were taken into consideration when designing this system, which can make daily operation easier and more seamless. As a result, the system can guarantee that business operations are accurate, efficient, reliable, secure, and user-friendly.

This study also aims to develop a system that specializes in Optimizing Healthcare Access and Service Quality through Online Appointment System for L. B. De Guzman Clinic. The Objectives Includes: (1) Confirm patient request schedule,

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prevent delays, and conflicting schedules. (2) A web-based system that includes features like appointment scheduling, user access, daily reports, alerts or notifications, and dental records. (3.) Minimize the clinic staff's time keeping track of patient information. (4.) To SMS or email personalized reminders (5.) Ensure a reliable web-based system ready so that admins can quickly access their patient records. (6.) In order to save money on using printed material and other physical copies, the data will be maintained in a database and well secured.



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### **CHAPTER II**

#### **REVIEW OF RELATED LITERATURE**

The purpose of the review of related literature and related study is to provide an overview of the theoretical background and of relevant empirical data for the project as a whole. A wide range of different fields, types of data and theoretical perspectives are covered in the review of theory.

#### **FOREIGN LITERATURE (SUMMARIZE)**

According to Aaron Smith (2018), the rise of the Internet has caused many elements of life to change and people's daily lives are now inextricably linked to the network. The development of science and existent objects is called technology. Using modern, high-tech equipment increases our comfort level and simplifies our daily lives. Nowadays, people compete with technology to produce high-quality work. In the modern world, technology has saved lives and gone above and beyond. That's why doing things these days without technology is difficult for us.

Appointment Scheduling (AS) plays a crucial role in reducing wait times and optimizing resources in healthcare institutions. AS aims to create a system that maintains quality standards amidst scheduling uncertainties in healthcare (Ala & Chen,



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2022). Additionally, according to Kumar et al 2019, online appointment systems allow patients to easily connect with doctors through websites or applications, offering flexibility in scheduling appointments according to their convenience. This online approach not only saves time for patients, physicians, and office staff but also enhances accessibility without the need for physical visits to hospitals.

Teke, Londh et. al (2019) analyzes a Clinical Management System which was developed to be able to reduce the burden experienced by doctors and nurses and basically get the records in one place. The development of a Web-Based System for this research would be similar to this research as it would aid getting information in one place.

Graham T, Ali S, Avdagovska M, Ballermann M (2020) analyzes how the effect of the patient portal has been in terms of user satisfaction in a Canadian hospital based on their visits. The research has passed through auditing the database of visits to supplement and cross reference with the data. This knowledge would be useful to the development of the system as the clinic is expected to acquire records on the patients wherein the clinic could use the pertinent data to be able to check if the users are satisfied with the performance of the clinic and if they go back and forth a number of times.



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As defined by Mardiah and Basri, an appointment refers to the allocated time for a patient's visit within the schedule.. Prioritizing patient comfort, clinics are increasingly adopting efficient appointment systems to reduce traditional long waiting times, which have often left patients dissatisfied (Mendoza S., et al., 2020).

Traditionally, scheduling a doctor's appointment has been a time-consuming task, often involving phone calls or in-person visits that may result in long wait times and inconvenience. Technical issues like poor connections or low battery life during phone calls further complicate the process. However, the emergence of online appointment systems has revolutionized this experience. These systems offer secure transactions and privacy, alleviating concerns about making payments online. With healthcare professionals increasingly turning to technology to enhance their services, online appointment scheduling tools represent a significant step forward in improving access and efficiency in medical care (Sminq, 2019).

Dental software has revolutionized the operations of dental offices and the delivery of patient care, marking a significant milestone in the evolution of modern dentistry. Offering a range of functionalities such as digital imaging, appointment scheduling, and patients record management, this technology has become an indispensable asset for the dental industry (Lara, 2023).



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Moreover, teledentistry involves providing dental care through virtual visits, either via phone or video-conferencing apps. Currently, numerous dental clinics are embracing video-conferencing platforms to offer superior patient care remotely (Da Fonseca, M. H., et al., 2021).

According to Tardieu (2015), he emphasizes the increasing need for effective healthcare appointment scheduling, especially in dental practices. The benefits of these systems are covered, including how they help patients and dental offices. Specific capabilities are included, such as the ability to plan appointments, see and download medical reports, update patient personal information, and help dentists with scheduling and patient databases. The design of the website, the database structure, the user interface, and server-side scripting are among the important topics discussed.

### **LOCAL LITERATURE (SUMMARIZE)**

Even though the appointment system has a number of benefits, it was determined that these benefits are also influenced by a number of other factors, including "arrival and service time variability, patient and provider preferences, available information technology, and the experience level of the scheduling staff." Nevertheless, they claimed that online scheduling is more useful than the traditional appointment system. In the traditional appointment system, scheduling is accomplished by physically entering the facility, and the wait time is frequently rather long. Waiting time is decreased while



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making appointments online (Onyefulu, 2018). Factors associated with dental appointments scheduling can affect positively or negatively the use of dental services (Melo et al., 2021).

This invention is related to an online booking system and related method that any user, individual, business, professional, or facility can utilize. The invention pertains more specifically to an online calendar system and a computer-implemented method for scheduling appointments online. Examples of users of these systems include dentists, doctors, restaurants, barbershops, and similar establishments. Users can make reservations on the calendar(s) that are set up online by the individual, company, or expert (Akshay et al., 2019).

Patients typically aren't aware of how much time a clinician has to address their problems when scheduling an appointment. Similar to the patient, the primary care provider frequently has no idea what the patient hopes to accomplish during the visit, which makes it difficult to know how much time to give to each concern as it develops and whether they can realistically expect to address necessary preventive services and chronic disease management (Matulis, J. C., & McCoy, R. G. 2020).

The office can save hours of time and money by integrating patient scheduling software, which will help the clinic stop losing time and money to cancellations and no-shows. Making customers properly utilize scheduling software won't be as difficult as





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you may expect because they are probably already extremely comfortable utilizing applications, online purchasing services, and virtual communication. Most patients will conduct an online search for a dentist before making their decision. Patients will want to make appointments at these times (either before you open or after you close), as this will frequently take place outside of business hours (Goldman, J. M., et al., 2019).

The features of online appointment booking systems, their potential to improve patient and dental clinic experiences, and the design and implementation of websites including database structure, user interface, and server-side scripting—are covered in this paper. Patients can amend their personal information, examine and download their medical reports, make appointments, and view their appointment history on the website. In addition to managing their patient database and generating medical reports for their patients, dentists can also view and edit their scheduled appointments (Sugashini et al., 2023).



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### **CHAPTER III**

#### **TECHNICAL BACKGROUND**

This chapter presents the technical background of the study including the front end, back end and database.

#### **TECHNICAL BACKGROUND OF THE PROJECT (ALUMNI TRACING)**

Online Appointment System refers to a system developed to avoid conflicts with schedules and delays of information in business daily operations. The researchers have used web-based programs wherein the users or the client can access it through any preferred digital platforms. The Online Appointment System is an online application for the patient to have easy access to getting appointment schedules effortlessly and less time consuming.

#### **TECHNICAL BACKGROUND OF THE SYSTEM**

The system's front end and back end are HTML, CSS and JAVASCRIPT, which are technically used for designing and configuring functionality of the system. Database on the other hand is mysql (xampp) used to set the system's own database. Thus, hostinger is primarily used for web hosting services. It provides individuals and businesses with the infrastructure and tools needed to publish the websites or web applications on the internet. For hardware Specifications of the system, to ensure that the



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system will run smoothly and work efficiently we are using intel Core I3-4th gen with 4gb ddr3 and storage of 256gb ssd. Moreover, the operating System used is Windows 7 which is applicable or accessible for any devices such as android and IOS.



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### **CHAPTER IV**

#### **RESEARCH METHODOLOGY**

This chapter presents the methodology of the study including the design, respondents, instrumentation, procedure, and limitations.

#### **DESIGN AND DEVELOPMENT OF THE SYSTEM**

##### **Interview and Survey Method**

To address research issues, mixed methods research incorporates aspects of both qualitative and quantitative research. Because mixed techniques include the advantages of both quantitative and qualitative research, it provides a more comprehensive picture than either one alone (George, 2023). The researchers have used a mixed method in data gathering. Wherein data accumulated from a research survey questionnaires and disseminated to corresponding respondents through a google form online. Apart from this, researcher's also personally interviewed Doctor L. B. De Guzman the Owner/Dentist of the clinic.

##### **Peer to Peer**

To ensure that everyone will perform and do their designated tasks, the researchers disseminate tasks equally. The system's head programmer will be Sofia Angela Baltazar and with further assistance of her Co-Programmer Dollesin Amerson.

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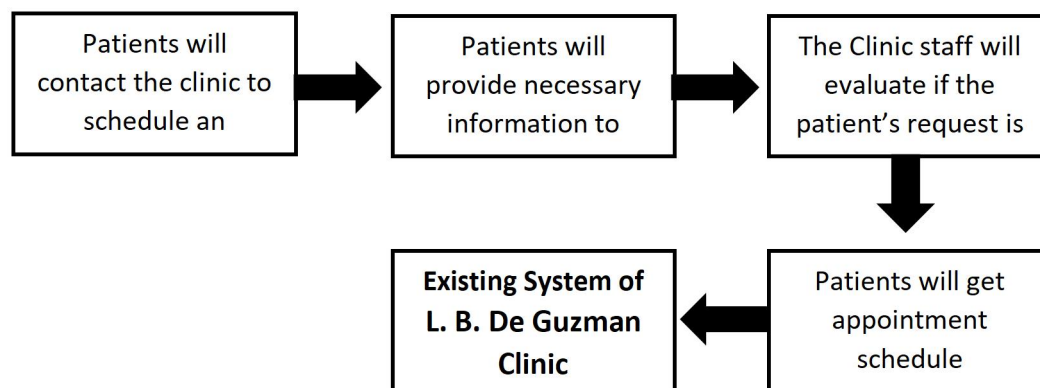


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The Technical writer for the system's documentation is assigned to Riana Manalo and Christian Dean Reyes. The entire group member will be the system analyst to assess the system's front-end development.

### **THEORETICAL FRAMEWORK**

A theoretical framework is a foundational review of existing theories that serves as a roadmap for developing the arguments you will use in your own work. Theories are developed by researchers to explain phenomena, draw connections, and make predictions. In a theoretical framework, you explain the existing theories that support your research, showing that your paper or dissertation topic is relevant and grounded in established ideas (Vinz, 2023).



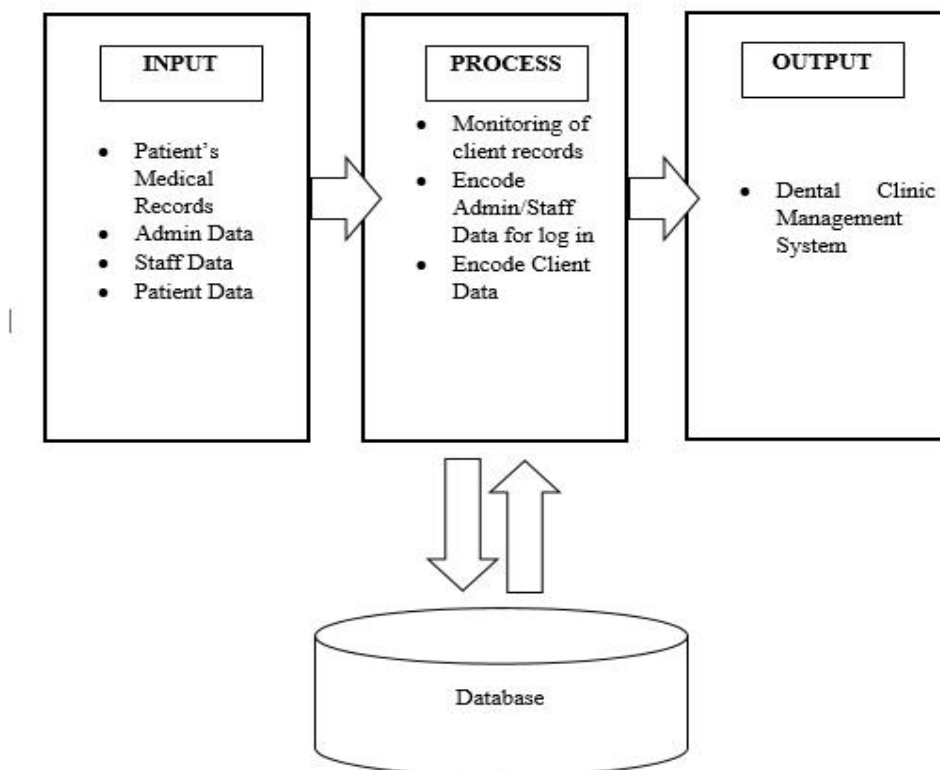
***Figure 1: Theoretical Framework of the Existing System***



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This figure shows the INPUT-PROCESS-OUTPUT model of the existing system. The researchers aim to address the steps and relations from each phase: The input phase is that patients must provide medical records at their clinic up to process phase, monitoring and encoding of patient data, patient scheduled time and date are notified through email or Facebook page.

### **CONCEPTUAL FRAMEWORK**



***Figure 2: Conceptual Framework of the Proposed System***



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Figure 2 represents the conceptual framework of the system. The researchers aim to illustrate the concept of the developed system. The figure shows how the existing manual processing will develop to Online Appointment Application.

### **TESTING AND IMPLEMENTATION**

#### **Target Clientele**

The Proposed System will specifically benefit the L. B. De Guzman Clinic, located at Maunlad Menzyland Malolos Bulacan.

#### **DESIGNED FEATURES OF THE DEVELOPED SYSTEM**

The important attributes to develop the Enhancing Healthcare Access: A Dental Clinic Appointment System for L. B. De Guzman Clinic are the following;

**Functional Suitability** - is a quality characteristic used to assess how well a system or software application satisfies the functional requirements for a specific purpose or use case.

**Compatibility** – refers to the ability of different systems, components, or software to work together without issues or conflicts.

**Performance Efficiency** – Ensure that the system operates efficiently, meeting performance requirements and providing a satisfactory user experience.



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**Usability** – It encompasses various aspects of the user experience and focuses on making systems intuitive, accessible, and enjoyable for users.

**Reliability** – The system can be trusted to operate effectively and provide accurate results under various conditions, without unexpected failures or errors.

**Security** – Ensure the confidentiality, integrity, and availability of information and resources, safeguarding them from potential threats and risks.

**Maintainability** – The system is able to be easily and cost-effectively maintained, modified, and repaired over its lifecycle.

**Portability** – The system runs efficiently across different hardware platforms, operating systems, or execution environments, allowing for flexibility and adaptability to diverse deployment scenarios.

### **DEVELOPMENT PROCESS OF THE PROPOSED SYSTEM**

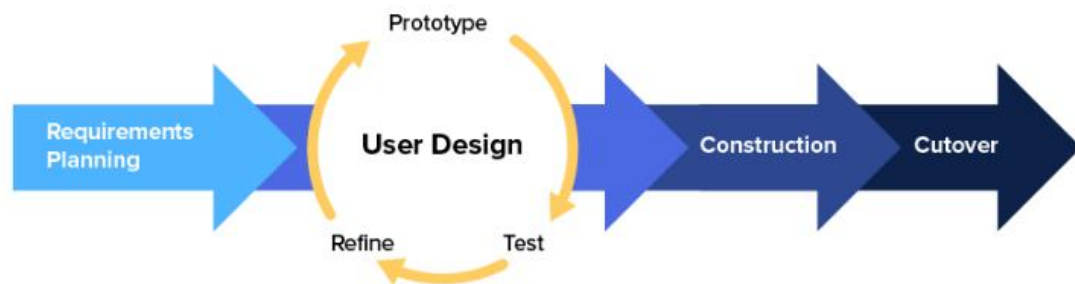
The creation of Enhancing Healthcare Access: A Dental Clinic Appointment System for L. B. De Guzman Clinic followed the Rapid Application Development (RAD). According to Chien (2020), the goal of the rapid application development (RAD) methodology is to create apps quickly by iterating often and receiving feedback continuously. The IT sector is under pressure to offer functional products more quickly as





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the fiercely competitive software market highlights a greater need for new applications. As a result, Rapid Application Development (RAD) is quickly becoming necessary.



***Figure 3: Rapid Application Development***

### **REQUIREMENTS PLANNING**

The proponents' initial step was to come up with a list of issues and potential solutions for the proposed system. The researchers examined the current system of L. B. De Guzman's Clinic at Maunlad Menzyland Malolos Bulacan. And chose to develop an online dental appointment system and wished to discuss how the system would operate? What kind of design is appropriate? and Which elements of the suggested system are applicable?



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### **USER DESIGN**

To properly address issues concerning the existing system, the researchers conducted surveys, interviews and observed L. B. De Guzman's Clinic on their daily operations. Moreover, to help resolve the existing problems researchers seek for related studies and literature to support the study.

### **PROTOTYPE**

The proponents worked together to enhance and develop the existing system, up until the proposed system has been implemented.

### **TEST**

The proponents and users collaborated to ensure that the proposed system met the given guidelines and criteria for the system development. Thus, patients and staff of L.B. De Guzman Clinic utilized the system for testing and provided suggestions for better system output.

### **REFINE**

The proponents proceed on improving the system based on L. B. De Guzman Clinic's review and suggestions. Wherein, issues were able to be addressed and ensure that their needs and satisfaction had been met.



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### **CONSTRUCTION**

The majority of the bugs were resolved and the expert's recommendations were finalized as the proponents worked on the last phase. Additionally, proponents ensured that the suggested system will operate without problems and that the outcome met the users' expectations.

### **CUT OVER**

The proponents implement the developed system and maintenance.

### **VALIDITY OF THE SYSTEM BY THE EXPERT**

The system was evaluated based on the following criteria: Functional Suitability, Compatibility, Performance Efficiency, Usability, Reliability, Security, Maintainability and Portability of the system. The score in the scale was the average of the weights assigned to the particular responses made by the experts. To interpret the rating of experts on the scale, the following are the intervals and their corresponding descriptions for acceptability were used.

<b>Rating</b>	<b>Equivalent Range</b>	<b>Interpretation</b>
5	4.51 – 5.00	Highly Acceptable (HA)
4	3.51 – 4.50	Acceptable (A)
3	2.51 – 3.50	Moderately Acceptable (MA)
2	1.51 – 2.50	Unacceptable (UA)
1	1.00 – 1.50	Highly Unacceptable (HU)



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***Table 1: Rule of Thumb***

- A. Functional Suitability - is a quality characteristic used to assess how well a system or software application satisfies the functional requirements for a specific purpose or use case.

ATTRIBUTES	EXISTING				
	5 HA	4 A	3 MA	2 UA	1 HU
1. Functional Completeness. The system meets the defined functional criteria and provides a comprehensive set of features to support its intended purpose.					
2. Functional Correctness. The system performs its intended functions accurately and without errors.					
3. Functional Appropriateness. The system meets its specified functional requirements in a manner that is suitable for its intended purpose.					

***Table 2.0: Functional Suitability***

- B. Compatibility – refers to the ability of different systems, components, or software to work together without issues or conflicts.

ATTRIBUTES	EXISTING				
	5 HA	4 A	3 MA	2 UA	1 HU
1. Co-existence. Refers to the ability of different components, technologies, or entities to operate simultaneously within the same environment without interference or conflict.					
2. Interoperability. Refers to the ability of different systems, devices, or software to work together and exchange information seamlessly					

***Table 3.0: Compatibility***

- C. Performance Efficiency – Ensure that the system operates efficiently, meeting performance requirements and providing a satisfactory user experience.



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ATTRIBUTES	EXISTING				
	5 HA	4 A	3 MA	2 UA	1 HU
1. Time Behavior. The system behaves over time in terms of response times, processing speed, and overall efficiency.					
2. Resource Utilization. System identifies the performance bottlenecks, inefficiencies, or areas for improvement.					
3. Capacity. The system ensures that the system can grow to meet the needs of a growing user base or increasing data volume.					

*Table 4.0: Performance Efficiency*

D. Usability – It encompasses various aspects of the user experience and focuses on making systems intuitive, accessible, and enjoyable for users.

ATTRIBUTES	EXISTING				
	5 HA	4 A	3 MA	2 UA	1 HU
1. Appropriateness Recognizability. Users can recognize and understand elements within a system based on their prior knowledge and experience.					
2. Learnability. Users can easily understand and learn to use the system, product, or interface.					
3. Operability. The system can be operated, monitored, and maintained by its users and administrators.					
4. User Error Protection. The system creates a forgiving and user-friendly environment that minimizes the likelihood of mistakes and provides users with opportunities to correct errors if they occur.					
5. User Interface Aesthetics. The system creates a visually pleasing and engaging experience for users.					
6. Accessibility. The system creates inclusive and barrier-free environments, ensuring that everyone, including individuals with disabilities, can participate fully in various activities, access information, and interact with technology.					

*Table 5.0: Usability*



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- E. Reliability – The system can be trusted to operate effectively and provide accurate results under various conditions, without unexpected failures or errors.

ATTRIBUTES	EXISTING				
	5 HA	4 A	3 MA	2 UA	1 HU
1. Maturity. The system ensures evaluating processes, capabilities, and outcomes to identify areas for enhancement and optimization.					
2. Availability. The proportion of time that a system, service, or application is operational and accessible for use.					
3. Fault Tolerance. The systems are designed to continue operating even in the presence of faults or failures.					
4. Recoverability. The system can quickly and effectively restore normal operation after a disruption, failure, or disaster.					

**Table 6.0: Reliability**

- F. Security – Ensure the confidentiality, integrity, and availability of information and resources, safeguarding them from potential threats and risks.

ATTRIBUTES	EXISTING				
	5 HA	4 A	3 MA	2 UA	1 HU
1. Confidentiality. System ensures that only authorized individuals or systems can access certain data, and it is a fundamental aspect of safeguarding sensitive or classified information.					
2. Integrity. Systems protect the information from unauthorized modifications, alterations, or corruption, thereby preserving the trustworthiness and reliability of the data and the systems that process or store it.					
3. Non-repudiation. The system ensures that the parties involved in a communication or transaction cannot deny their actions or the authenticity of the data they exchanged.					
4. Authenticity. The system ensures that the identity of the parties involved can be verified, and the					



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information or transactions can be relied upon as being legitimate and unaltered.					
5. Accountability. The system ensures that only authorized individuals can perform specific actions.					

**Table 7.0: Security**

G. Maintainability – The system is able to be easily and cost-effectively maintained, modified, and repaired over its lifecycle.

ATTRIBUTES	EXISTING				
	5 HA	4 A	3 MA	2 UA	1 HU
1. Modularity. The systems are designed to operate independently of one another.					
2. Reusability. The system emphasizes the development of components, modules, or systems in a way that allows them to be easily reused in different contexts or applications.					
3. Analyzability. The system that is highly analyzable allows developers, analysts, and other stakeholders to examine its structure, behavior, and performance efficiently.					
4. Modifiability. The system facilitate updates, enhancements, and modifications with minimal effort and impact on the overall system					
5. Testability. The system facilitates the testing process, making it efficient to identify and diagnose issues, verify functionality, and ensure that the system meets its specified requirements.					

**Table 8.0: Maintainability**

A. Portability – The system run efficiently across different hardware platforms, operating systems, or execution environments, allowing for flexibility and adaptability to diverse deployment scenarios.

ATTRIBUTES	EXISTING				
	5 HA	4 A	3 MA	2 UA	1 HU
1. Adaptability. The system evolve and respond to varying conditions without requiring extensive modifications to its core architecture					



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2. Installability. The system provides a smooth and user-friendly installation experience, minimizing potential issues and errors during the installation process					
3. Replaceability. The system can be replaced with minimal impact emphasizing the ability to substitute or upgrade components without requiring extensive modifications to other parts of the system.					

**Table 8.0: Portability**

**GRAPHICAL DESCRIPTION REPRESENTATION OF THE EXISTING L. B. DEGUZMAN CLINIC**

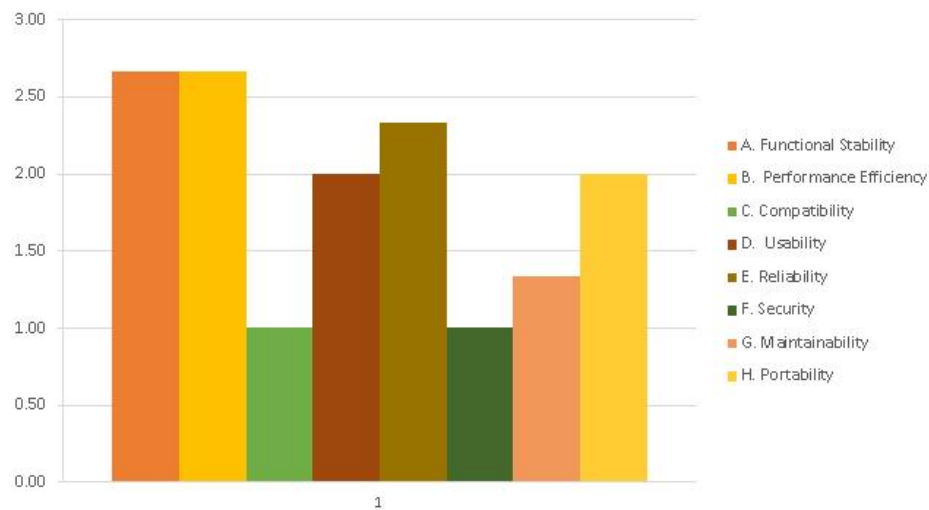
Summary					
<b>A. Functional Stability</b>			<b>Ave.</b>		
Q1	Unacceptable		2.00		
Q2	Unacceptable		3.00		
Q3	Moderately Acceptal		3.00		
Total Average:			2.67		
<b>B. Performance Efficiency</b>			<b>Ave.</b>		
Q1	Unacceptable		3.00		
Q2	Unacceptable		2.00		
Q3	Unacceptable		3.00		
Total Average:			2.67		
<b>C. Compatibility</b>			<b>Ave.</b>		
Q1	Unacceptable		1.00		
Q2	Unacceptable		1.00		
Q3	Unacceptable		1.00		
Total Average:			1.00		
<b>D. Usability</b>			<b>Ave.</b>		
Q1	Unacceptable		2.00		
Q2	Unacceptable		2.00		
Q3	Unacceptable		2.00		
Total Average:			2.00		
<b>E. Reliability</b>			<b>Ave.</b>		
Q1	Unacceptable		2.00		
Q2	Unacceptable		3.00		
Q3	Unacceptable		2.00		
Total Average:			2.33		
<b>F. Security</b>			<b>Ave.</b>		
Q1	Highly Unacceptable		1.00		
Q2	Unacceptable		1.00		
Q3	Unacceptable		1.00		
Total Average:			1.00		
<b>G. Maintainability</b>			<b>Ave.</b>		
Q1	Unacceptable		1.00		
Q2	Unacceptable		2.00		
Q3	Unacceptable		1.00		
Total Average:			1.33		
<b>H. Portability</b>			<b>Ave.</b>		
Q1	Highly Unacceptable		2.00		
Q2	Highly Unacceptable		2.00		
Q3	Unacceptable		2.00		
Total Average:			2.00		

**Figure 4.1: Existing System Summary Result**





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**OVERALL VS SUMMARY**



**Figure 4.2: Existing Overall vs Summary Result**

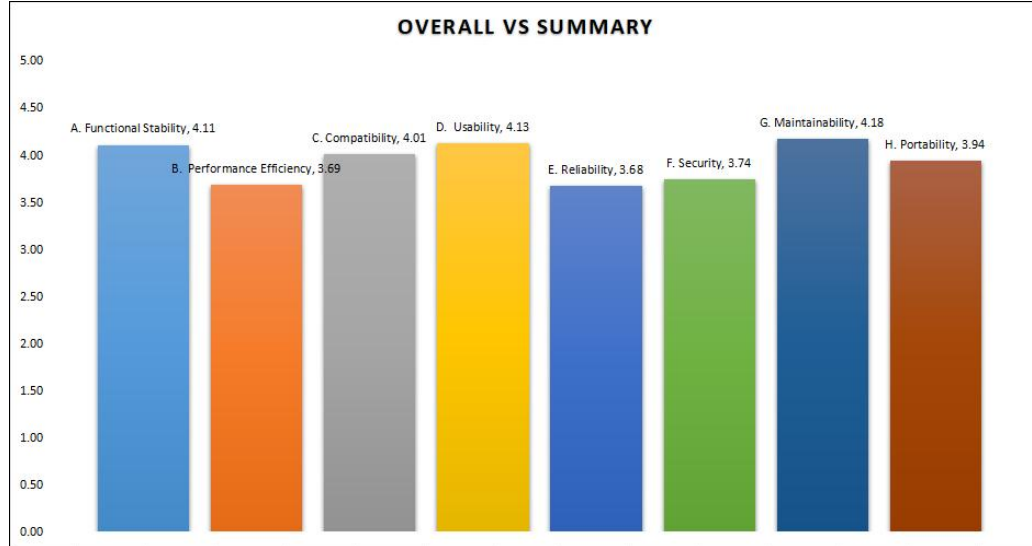
**GRAPHICAL DESCRIPTION REPRESENTATION OF THE PROPOSED L. B. DEGUZMAN CLINIC**

Summary			
A. Functional Stability		E. Reliability	
Q1	Unacceptable	Q1	Unacceptable
Q2	Unacceptable	Q2	Unacceptable
Q3	Moderately Acceptab	Q3	Unacceptable
Total Average:		Total Average:	
4.11		3.68	
B. Performance Efficiency		F. Security	
Q1	Unacceptable	Q1	Highly Unacceptable
Q2	Unacceptable	Q2	Unacceptable
Q3	Unacceptable	Q3	Unacceptable
Total Average:		Total Average:	
3.69		3.74	
C. Compatibility		G. Maintainability	
Q1	Unacceptable	Q1	Unacceptable
Q2	Unacceptable	Q2	Unacceptable
Q3	Unacceptable	Q3	Unacceptable
Total Average:		Total Average:	
4.01		4.18	
D. Usability		H. Portability	
Q1	Unacceptable	Q1	Highly Unacceptable
Q2	Unacceptable	Q2	Highly Unacceptable
Q3	Unacceptable	Q3	Unacceptable
Total Average:		Total Average:	
4.13		3.94	

**Figure 5.1: Proposed System Summary Result**

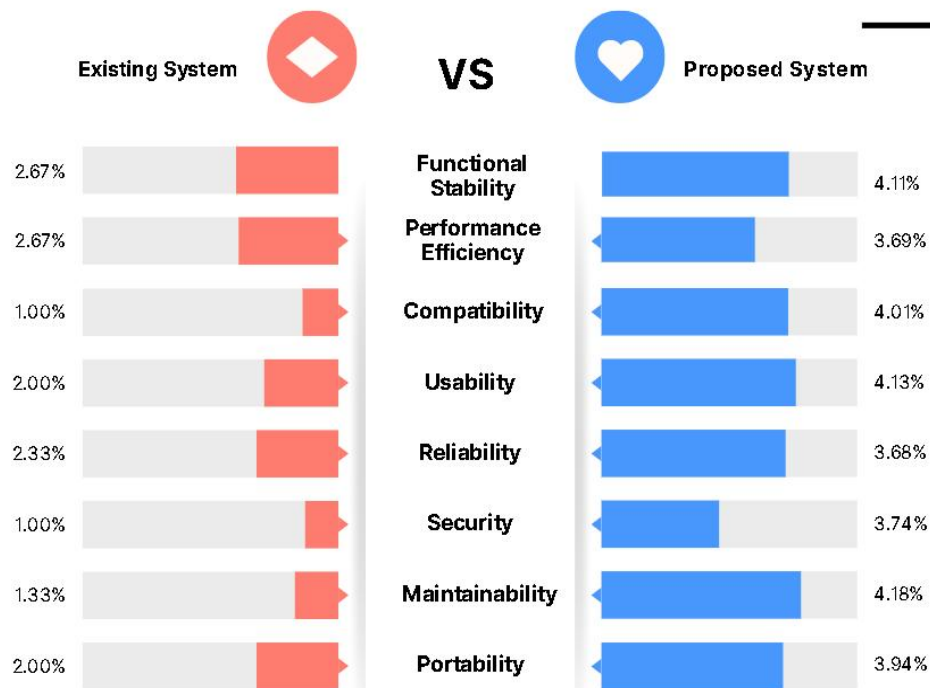


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*Figure 5.2: Proposed Overall vs Summary Result*

### COMPARISON CHART



*Figure 6: Existing System vs Proposed System Overall Result*



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The figure provided above shows that the proposed system has significantly improved in terms of its Functional Suitability, Compatibility, Performance Efficiency, Usability, Reliability, Security, Maintainability and Portability, and overall performance compared to the existing system. The existing system has been found to be unacceptable in all aspects, with an overall weighted mean of 2.11. Meanwhile the proposed system has been rated acceptable with an overall weighted mean of 4.21.



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### **CHAPTER V**

#### **RESULTS AND CONCLUSION**

This chapter focused on the summary of findings, that were based on the results and discussions, conclusions, as well recommendations.

#### **RESULTS AND FINDINGS**

After the data were analyzed and interpreted, the following results were obtained. The evaluation results of the existing system suggests that the existing system performs poorly in all areas evaluated. The functional suitability rating was 2.71, which is considered unacceptable, along with other criteria such as performance efficiency, compatibility, usability, reliability, security, maintainability and portability ratings, which were all similarly unacceptable. The overall general weighted mean of the existing system was 2.11, indicating that the system's performance across all areas was unacceptable. These findings indicate that significant improvements are necessary to bring the system's performance up to acceptable standards.

The summary of findings for the proposed system shows that it performed well across all areas evaluated. The system scored highly in functional suitability, with a



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rating of 4.11, indicating that it is highly acceptable. Thus, performance efficiency also received an acceptable rating of 3.69, followed by Compatibility of 4.01, usability of 4.13, reliability of 3.68, security of 3.74, maintainability of 4.18 and portability of 3.94. The system scored highly in maintainability, with a rating of 4.18, and functional suitability, with a rating of 4.11, indicating that it is highly acceptable in these areas. The overall general weighted mean for the developed system was 4.21, indicating that its performance was highly acceptable across all areas. Therefore, findings suggest that the proposed system is considered eligible to provide Functional Suitability, Compatibility, Performance Efficiency, Usability, Reliability, Security, Maintainability and Portability making it a reliable, effective and efficient system.

## **CONCLUSION**

Based on the findings, it can be concluded that the proposed system has significantly improved in terms of its Functional Suitability, Compatibility, Performance Efficiency, Usability, Reliability, Security, Maintainability and Portability, and overall performance compared to the existing system. The existing system has been found to be unacceptable in all aspects, with an overall weighted mean of 2.11. Meanwhile the proposed system has been rated acceptable with an overall weighted mean of 4.21.

In conclusion, the study has successfully met the objectives of Enhancing Healthcare Access: A Dental Clinic Appointment System for L. B. De Guzman Clinic based on the ISO/IEC25010 standard.



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The online platform solves the issues and guarantees that the dental clinic appointment system will function efficiently on a daily basis, minimizing the quantity of paper-based transactions, efforts, and patient waiting times for scheduled appointments. Now that appointments can be easily scheduled online, patients and staff can save a great deal of money, time, and effort.

Additionally, the suggested system offers a real-time web portal that enables staff and patients to monitor the status of their appointments. Patients may simply check the status of their appointment using the online portal, which reduces the need for them to call dental offices frequently for updates. In addition to saving time, this guarantees openness and lessens staff and patient concern.

In addition, the online platform facilitates effective communication between patients and staff. Administrators can use the system to send messages, request additional information or documentation, and provide updates to patients. This feature greatly reduces the need for face-to-face communication, streamlining the process and saving time and effort for both parties involved.

Overall, the Enhancing Healthcare Access: A Dental Clinic Appointment System has significantly improved the application process for patients of L. B. De Guzman Clinic. It has eliminated manual paperwork, provided real-time application tracking, and enhanced communication between patient and staff. This system brings efficiency, convenience, and transparency to the appointment process, benefiting both patient and staff alike.



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### **RECOMMENDATION**

The recommendations that the researchers made are listed below and are based on the issue where they can be beneficial to everyone. It is advised that the designed system be implemented since it has the potential to significantly enhance the system's overall performance, which will enhance the overall satisfaction of users. The created system can be used as a guide for the necessary enhancements. Furthermore, it is vital to carry out regular evaluations and testing of the system to guarantee its continued compliance with the necessary criteria. Lastly, in order to maintain the system's durability and effectiveness, it is advised to stay current with technological developments and integrate them into the system.