**Designing a Student-Centric Clinic Management System for BISU Balilihan**

A Project Presented

to the faculty of the

College of Computing and

Information Sciences

BISU Balilihan Campus

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In Partial Fulfillment of the

Requirements of the Subjects

CS 224 – Software Engineering

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**CHAPTER I**

**THE PROBLEM AND ITS SCOPE**

**INTRODUCTION**

**Rationale**

Nowadays, many systems have been developed to make life easier. The combination of both human and computer interface contributes a lot with the development, as it becomes a natural step forward. It is almost a requirement that people put technology in everything they do for it to become much easier. It is always the hope of everyone to make their work easier and simpler. With the many advances in information technology over the years, particularly in healthcare, a number of different forms of electronic health care system have been developed and implemented.

In every school, it is vital to have a system that tracks the medical transactions of its students. The researchers notice that BISU Balilihan Campus Clinic use papers to record the patient histories. This represents the massive fragmentation of clinical health information. In addition, the noticeable increase of enrollees in BISU Baliliihan Campus requires an efficient way for collecting, keeping and accessing their medical records.

Furthermore, with the new normal, medical results and certificates are now submitted electronically by uploading a photo or scanned copy of the documents. The Campus Nurse the downloads and prints the documents which are subsequently filed in folders then stored inside the cabinets.

With this, the researchers conceptualize the BISU Clinic Medical Record System, the proposed study is an advanced tool for BISU Balilihan Medical and Dental Unit which is made to have a simple and well-organized storage of medical records of patients and inventory system. This system well maintain all the records in an accessible and convenient way in storing, retrieving, generating reports and organizing data.

The efficient management of healthcare services is important for the well-being of students, which affects their academic success. Right now, the Bohol Island State University (BISU) Balilihan Clinic continues to employ paper-based systems for the completion of forms and the processing of medical records. This system worked in the past, but with a growing student population, it’s no longer as effective. Dependence on paper records causes slow access to data, records updating, and increased potential for errors, all of which may impact the quality of care provided to the students and faculty.

In an academic setting, quick and accurate healthcare is vital, and therefore it is necessary to upgrade the management system of the clinic. This thesis will create a system for BISU Balilihan Clinic that will solve these problems. The new system will be a desktop-based application, not a web-based one, and will automate key tasks such as medical record tracking, consultation documentation, and vital sign monitoring.

The main motivation behind this project is to provide solution for the problems that result from the existing manual process. Paper-based records take up a lot of time to manage and can cause errors, which affects the quality of healthcare. A desktop-based, digital system has the potential to fix these problems through the provision of faster, accurate, and easier processes.

The system will consolidate patient records, facilitate access and updating of information. It will also enable healthcare providers to document more efficiently consultations. The digital system will lighten the administrative burden on clinic workers and enhance the quality of care by providing health information at hand. Security will be ensured, with measures in place to protect sensitive health information through secure storage and backups.

In the light of preceding discussion, the researchers aim to replace the current manual system with a more modern, efficient, and secure desktop application. This will not only improve the clinic’s operations but also deliver improved healthcare services to students.

**Literature Background**

The Designing a Student-Centric Clinic Management System overcomes the shortcomings of manual clinic operations by automating key functions such as consultation documentation, and medical record management. Manual paper-based processes tend to cause delays, errors, and inefficiencies in handling student health information.

Recent research, including by Smith et al. (2019) has pointed to the benefits of digital healthcare systems for enhancing operational efficiency and data correctness, with resultant better-quality services. Gonzales and Lee (2020) add that secure data handling is equally critical, highlighting that contemporary systems include encryption and backup functions for protecting sensitive student health data.

Moreover, studies in eHealth and health informatics (e.g., Hernandez et al., 2021) shows that the use of electronic health records (EHR) and clinic management systems results in improved health outcomes, more preventive care, and enhanced student satisfaction. Centralizing health information enables timely interventions, personalized healthcare, and enhances overall student well-being. The move towards automation enhances efficiency and ensures accurate records.

**Theories and Conceptual Framework**

This study is based on the Health Information Technology (HIT) Adoption Model emphasizes factors like organizational readiness, system reliability, and perceived benefits, which are crucial for the successful implementation of digital systems in healthcare. For the clinic management system, staff training, system support, and clear advantages such as improved efficiency.

According to the Diffusion of Innovations Theory (Rogers, 2003), the adoption of innovations occurs at different rates, depending on their relative advantage, compatibility, and simplicity. The clinic management system will likely follow this pattern, with early adopters leading the way to wider adoption as the system proves effective and easy to use.

The conceptual framework for this study shows the relationship between key inputs, processes, and desired outcomes in the implementation of the student-centric clinic management system. The main inputs include the clinic’s current challenges, such as inefficiency in manual record-keeping, the selection of a user-friendly digital system, and proper user training.

The processes include developing the clinic management system, digitizing patient records. The desired outcomes are improved clinic efficiency, faster access to medical records, enhanced data security, and higher user satisfaction.

**Legal Bases**

Aside from theories mentioned, the study is also supported by the following legal bases:

**Data Privacy Act of 2012 (Republic Act No. 10173)** – It is the policy of the State to protect the fundamental human right of privacy, of communication while ensuring free flow of information to promote innovation and growth. The State recognizes the vital role of information and communications technology in nation-building and its inherent obligation to ensure that personal information in information and communications systems in the government and in the private sector are secured and protected.

**Republic Act No. 11223**- known as the “Universal Health Care Act”, it is the policy of the State to protect and promote the right to health of all Filipinos and instill health consciousness among them. It mandates the integration of electronic health records (EHR). Towards this end, the State shall adopt:

(a) An integrated and comprehensive approach to ensure that all Filipinos are health literate, provided with healthy living conditions, and protected from hazards and risks that could affect their health;

(b) A health care model that provides all Filipinos access to a comprehensive set of quality and cost-effective, promotive, preventive, curative, rehabilitative and palliative health services without causing financial hardship, and prioritizes the needs of the population who cannot afford such services;

(c) A framework that fosters a whole-of-system, whole-of-government, and whole-of-society approach in the development, implementation, monitoring, and evaluation of health policies, programs and plans; and

(d) A people-oriented approach for the delivery of health services that is centered on people’s needs and well-being, and cognizant of the differences in culture, values, and beliefs.

For universities and colleges, the Commission on Higher Education (CHED) provides guidelines regarding health services for students, including the maintenance of medical records and the provision of essential healthcare services. The clinic management system must comply with CHED's requirements by maintaining accurate and up-to-date medical records for students and ensuring that health services are readily available to them.

The National Health Information Systems (NHIS) Framework issued by the Department of Health (DOH) establishes standards for managing health information at the national level. Schools offering health services should follow these standards in terms of data integration, management, and security. The clinic management system must adhere to these frameworks to ensure consistency with national health systems.

In Security Standards and Data Integrity, a)ISO/IEC 27001 - Information Security Management Systems (ISMS). Schools, especially those dealing with large volumes of student data, should consider aligning their clinic management systems with international standards like ISO/IEC 27001. This framework provides a comprehensive approach to managing sensitive data securely, ensuring that student health records are protected through secure access controls, encryption, and audit trails. b) Regular Security Audits and Compliance Checks- regular audits and compliance checks should be conducted to ensure the system complies with national privacy laws and health data protection regulations. The National Privacy Commission (NPC) also advises educational institutions to conduct these checks periodically to protect the integrity of health data.

**Designing a Student-Centric Clinic Management System for BISU Balilihan**

**A Proposed Technology Package**

**Republic Act No. 10173**

Known as the Data Privacy Act of 2012, to ensure that personal information are secured and protected.

**Republic Act No. 11223**

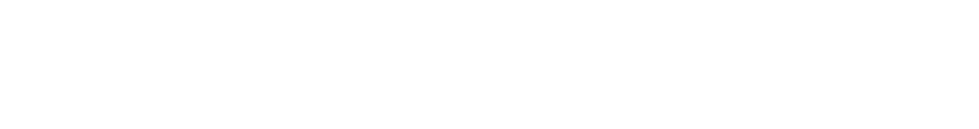
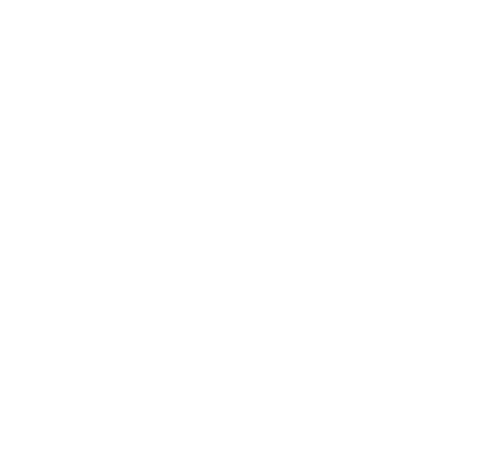
Known as the Universal Health Care Act, to promote the right to health of all Filipinos. It mandates the integration of electronic health records.

**Health Information Technology Adoption Model**

Emphasizes factors like organizational readiness, system reliability, and perceived benefits

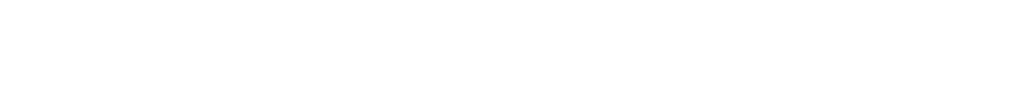
**Diffusion of Innovations Theory (Rogers, 2003)**

The clinic management system will likely follow this pattern, with early adopters leading the way to wider adoption as the system proves effective and easy to use.



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| Characteristics and Features   * Add/Edit patient information * Add clinical records * Send notification to patient * See totality of patient * Realtime Analytics * Print records |



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**FIGURE 1: SCHEMATIC DIAGRAM**

**Statement of the Problem**

This study aims to design a system for Bohol Island State University (BISU) Balilihan Clinic. The research problems in this research can be formulated as:

1. What are the limitations of the current manual clinic management system at BISU Clinic?
2. How can a Student-Centric Clinic Management System improve the overall efficiency of the clinic’s operation?
3. What impact would the implementation of a digital system have on the accuracy and timeless of medical record updates?

**Significance of the Study**

The findings of the study will be valuable to the following:

**Students.** It will provide convenient and effective service to the students of BISU Balilihan. Student’s information and records are secured and accessible while confidentiality is assured.

**School.** Efficient and faster service will be provided to the clienteles to help improve the service.

**BISU Clinic Nurse**. It will provide accuracy and security in creating, checking, storing and updating data and assure timely retrieval and generation data and reports. Also, this desktop-based application is expected to provide efficiency and convenience that will help to improve the service of BISU Balilihan in terms of Consultation.

**Future Researchers.** This study will serve as a reference for future research on healthcare system improvements in academic settings.

**Research Methodology**

**Research Design**

The study will use the Developmental Research design. The purpose of this study is to have consultation of the user in an application for unified management through information technology and help improve the service of BISU Balilihan Clinic.

**Researcher Environment**

The locale of this study is the Bohol Island State University Balilihan Campus located at Magsija, Balilihan, Bohol. Still the clinic uses manual consultation and records. It might cause human errors and can misplace the records. Hence, the researchers will conceptualize the Student-Centric Clinic Management System for BISU Balilihan.

**Research Participants**

The respondents of the study are the students, faculty and staff, and the Campus Nurse of BISU Balilihan. Students, faculty and staff are the client of the BISU Clinic. The campus nurses are the knowledgeable of the process of the consultation and records. The respondents will test the feature of the Student-Centric Clinic Management System for BISU Balilihan.

**Data Gathering Instrument**

**Interview and Discussion.** Interview with the campus Nurse regarding the process in Consultation and records to gather necessary information relevant for the development of the proposed system.

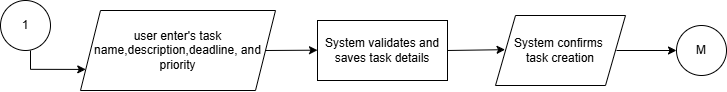
**Observation.** The researchers will visit the BISU Balilihan Clinic to observe how processes are done and to determine system boundary and integrity controls.

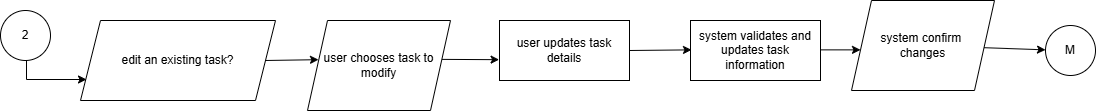
**Research Procedure**

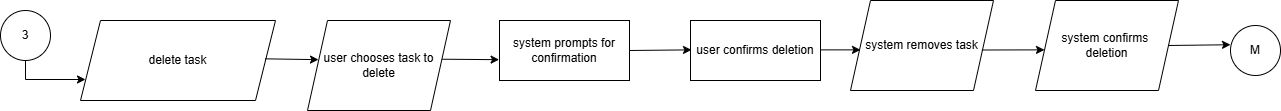
The study will use System Development Life Cycle (SDLC) Approach in developing the system solution. It is also a conceptual model use in project management that describe the stages involve in our system.

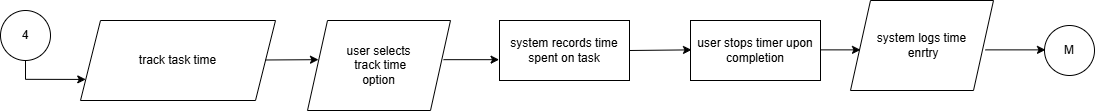
A diagram of a flowchart

AI-generated content may be incorrect.**Flowchart**









**Definition of Terms**

**CHAPTER II**

**PRESENTATION OF THE PRESENT AND PROPOSED SYSTEM**

1. **PRESENT SYSTEM**

**System Narrative**

It is very important to maintain the student health records to provide basic care. The School Nurse keeps the records of prescribed medicine of treatment with advice for the future use.

Medical records on paper consumes time and requires unnecessary costs for supplies such as paper, pen, folders, clips and others. In addition, storage space is needed to keep all these records.

During the enrollment, new students are required to submit a medical certificate, laboratory, and drug test results to the Campus Nurse. They will then be asked to fill out the Patients Records form. Once complete, these records will be kept in individual envelopes and will be stacked in the file cabinet, arrange alphabetically.

**Findings/Constraints**

From the gathered data, the researchers were able to identify some problems. These include slow retrieval of records, possibility of data loss, duplication of work, and huge space requirement for record-keeping. There are different records and documents printed or written on papers. In registering information, there are different forms to filled out. In keeping the information and storing, they used folders and put it inside the cabinet. There is a possibility in misplacing the documents or the data in this process. The duplication of work may occur and also, their time and energy are wasted when retrieving and returning the records in the cabinet.

1. **STUDENT CENTRIC CLINIC MANAGEMENT SYSTEM**

**System Rule**

In order to improve the quality of health care services of BISU Balilihan Campus, the Student Centric Clinic Management System is proposed as a viable solution. This is to improve the operation in recording patients’ information and transactions, and to achieve efficient reports and inventory system.

The researchers gathered all the data and information with regards to the present system and came up with the proposed system. The system was designed for every individual in order to acquire reliable information in a fast, easy and accurate way.

The Student Centric Clinic Management System is responsible in monitoring and keeping health information and also generate reports. Only admin account is authorized to use the system. The admin account has a unique username and password. The authorized user, which is the administrator, must supply the correct combination of username and password in the log in field to successfully use the system.

When opening the system for the first time, the admin will have to sign into his/her account in the log in form. Fields must be filled in correctly with the admin username and password. When logged in, a window will appear with the dashboard as the first page. The dashboard displays the total count of patient, diagnoses and medicine.

Another option in the main navigation is the file. If the user clicks on File button it will display the patients name and ID number. Some of actions like edit, view and delete can also be done. If the admin needs to edit the patient’s information, the admin can be update it in the update button. In the view option, the system will display the patient’s information and history. Medical visit button can also be found. If the user clicks on the medical visit button, the user will first choose the patients purpose of visit and then forms will appear with the option to give medicine. Another option is thee report button to print record if hardcopies are needed.

Lastly is the summary, it summarizes the patient’s transaction or access to the clinic according to the purpose of visit.