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**FACULTY OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF COMPUTER ENGINEERING**

**DESIGN AND IMPLEMENTATION OF A HOSPITAL MANAGEMENT INFORMATION SYSTEM**

*A dissertation submitted to the Department of Computer Engineering, Faculty of Engineering and Technology, University of Buea, in Partial Fulfilment of the Requirements for the Award of Bachelor of Engineering (B.Eng.) Degree in Computer Engineering.*

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**2023/2024 Academic Year**

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**Department of Computer Engineering   
Faculty of Engineering and Technology  
University of Buea**

**Certificate of Originality**

We the undersigned, hereby certify that this dissertion entitled **“DESIGN AND IMPLIMENTATION OF A HOSPITAL MANAGEMENT INFORMATION SYSTEM”** presented by ACHALE EBOT OMA, **Matriculation number FE20A002** has been carried out by him in the Department of Computer Engineering, Faculty of Engineering and Technology, University of Buea under the supervision of **PROF ELIE FUTE** and **DR. KENGNOU NICOLE.**

This dissertion is authentic and represents the fruits of his own research and efforts.

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**Dedication**

**Acknowledgment**

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**CHAPTER 1. GENERAL INTRODUCTION**

1. **Background and Context of Study**

Traditional paper-based systems in hospitals pose a significant challenge to effective patient care. Retrieving information is a time-consuming task, often requiring manual searching through physical folders. This delays treatment initiation and hinders real-time decision-making. Additionally, paper records are prone to errors like illegibility, misplacement, and loss, leading to inconsistencies in patient data and potentially compromising care quality. Incomplete medical histories can result in medication errors and misdiagnoses. Staff productivity also suffers due to the burden of managing cumbersome paperwork. These limitations translate to longer wait times for patients, potential harm due to inaccurate information, and difficulty in analyzing trends for improvement.

A Hospital Management Information System (HMIS) offers a powerful solution. It creates a centralized electronic database, granting real-time access to patient data and resource availability. This eliminates delays in retrieving information, facilitating efficient care coordination. Data validation features ensure accuracy and consistency, minimizing human error. Additionally, an HMIS streamlines record management by enabling easy access to complete medical histories regardless of physical records. This not only improves continuity of care but also frees up staff time for direct patient interaction. By collecting and analyzing data points, an HMIS empowers hospital administrators with valuable insights for informed decision-making, ultimately leading to improved patient care delivery, enhanced efficiency, and better resource management.

1. **Problem statement**

Hospital staff find it hard to manage the information in the hospital due to the traditional hand-written information used. This makes it difficult for them to know resources which are available for a patient at a given time. These resources could be the staff which include doctors and nurses, or the rooms available for the patient. When a patient needs medical attention, it will be difficult to know the rooms available for the patient, as well as available nurses and doctors who need to provide patient care. Also, this hand-written system makes it hard to reclaim, manage or process patients’ records when needed. This makes it difficult for the hospital staff to fully understand the patient’s problems in a case where the patient forgets his or her hospital book at home while coming either to do a consultation or do some lab tests.

1. **Objective of the Study**
   1. **General Objectives**

Build a digitalized and secure system which manages the information of hospitals in a user friendly way so that it can be easily retrieved by the staff when needed.

* 1. **Specific Objectives**
* Analyze other existing hospital management information systems which correspond to the problem mentioned. Know how the systems operate, their drawbacks and brainstorm solutions to these drawbacks
* Design a system which has similar functionalities to the existing systems which are very important to the staff and integrate the solution to their drawbacks as well.
* Implement the designed system to be user friendly in a way that staff can easily add or retrieve data from it.

1. **Proposed Methodology**

This project proposes a systematic approach to develop and implement a Hospital Management Information System (HMIS) that addresses the challenges outlined in the problem statement. The methodology will involve the following key phases:

* 1. **Requirements Gathering and Analysis:**
     1. **User Interviews and Surveys:**

Conduct interviews with key stakeholders, including doctors, nurses, administrative staff, and hospital management, to understand their specific needs and pain points regarding information management. Surveys can further gather broader perspectives on user requirements.

* + 1. **System Analysis:**

Analyze the existing paper-based system to identify its strengths and weaknesses. This involves understanding data flow, current processes, and limitations.

* + 1. **Defining Functional and Non-Functional Requirements:**

Based on the gathered information, document both functional requirements (what the system should do) and non-functional requirements (how the system should perform). This will include features like patient registration, appointment scheduling, medical record management, resource allocation, reporting, and security requirements like user access control and data privacy.

* 1. **System Design and Development:**
     1. **Technology Selection:**

Choose the appropriate technology stack for developing the HMIS. This includes selecting a database management system, programming language(s), and development frameworks based on factors like scalability, security, and integration capabilities.

* + 1. **System Architecture:**

Design the overall architecture of the HMIS, outlining the components, data flow, and communication between different modules. This includes functionalities like user interface design, data access layer, and business logic layer.

* + 1. System Development: Develop the HMIS functionalities based on the designed architecture and system requirements. This involves coding, unit testing, integration testing, and user interface development.
    2. System Implementation and Testing:

Data Migration: Migrate existing patient data from paper records to the electronic HMIS while ensuring data integrity and security. This may involve manual data entry or data conversion tools.

System Testing: Conduct comprehensive system testing to ensure the HMIS functions as intended. This includes unit testing, integration testing, user acceptance testing (UAT) involving hospital staff, and security testing to identify and address any vulnerabilities.

Training and User Support: Provide comprehensive training to hospital staff on using the HMIS effectively. This may involve user manuals, video tutorials, and hands-on training sessions. Ongoing support will be provided to address user queries and troubleshoot any issues that arise.

4. Evaluation and Deployment:

Evaluation: Evaluate the effectiveness of the implemented HMIS by collecting feedback from users and monitoring key performance indicators (KPIs) like improved access to information, reduced wait times, and enhanced data accuracy. This will help identify areas for further improvement.

Deployment: Once evaluation confirms the system's effectiveness and user satisfaction, the HMIS will be deployed for full-scale use within the hospital.

5. Maintenance and Support:

Ongoing maintenance will be provided to ensure the HMIS remains functional and secure. This includes addressing user concerns, bug fixes, system updates, and incorporating any future enhancements identified during evaluation.

1. **Research Questions**

* Are there existing systems which manage hospital information? If there are systems, what are their loop-holes?
* What are the features of these systems?
* How can the new system be made to take in data and send it out in an appealing way which is easy to understand.

1. **Research Hypothesis**
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4. **Delimitation of the Study**
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