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UNIT: SOFTWARE COMPUTING PROJECT

ST JOSEPH'S MISSION HOSPITAL- MIGORI

PATIENT'S RECORD MANAGEMENT SYSTEM

REPORT

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DECLARATION

I hereby declare that the work presented is original which has been done after the registration for the degree Bachelor of Science in Software Development at KCA University. This work has not been presented in any other place nor copied from other sources.

I have gone through the University's guideline on project research and understood them clearly. Therefore, I accept responsibility for the procedures conducted in accordance to KCA University.

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Supervisor's Name: ……

Sign: ……..

Dean of Faculty's Name: ……

Sign: ……

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I would also like to express my gratitude to the Vice Chancellor “Professor Isaiah Wakindiki” and “Professor Joshua Bagaka’s” for their provision of facilities in KCA University that have enabled us to successfully complete this project.

ABSTRACT

The purpose of this study is to produce develop a computerized Patient Record Management System for St Joseph's Mission Hospital that will help record, keep track and retrieve patient's records.
This study was able to produce a module that registers new patients, registers doctors, registers nurses, Assign patients with doctors and nurses, assign emergency cases, assign surgeries, Record patient's diagnosis, Assign patients to wards and beds, record patient progress, provides doctors and nurses their allocated patients, record patient fees and check out patients.

This study has used the Agile methodology in order to implement the software whereby the entire system was broken down into individual problems and were solved separately. Hence the software requirements are delivered iteratively.

In conclusion, I found that the system will help the hospital speed their process of record retrieval and record keeping. The patients will no longer worry of loosing their diagnosis cards because the records will be safely stored in both the cloud and a safe hard disk storage. The hospital will also smoothen its operations and provide a better experience for the customers.

TABLE OF CONTENTS

TABLE OF CONTENTS 6
CHAPTER 1: INTRODUCTION 9
1.1. Background 10
1.2. Problem Statement 10
1.3. Objectives 11
1.3.1 Main Objective 11
1.3.2 Specific Objective 11
1.3.3 System Objectives 11
1.4. Scope 12
1.5. The Importance of the Problem 12
1.6. Beneficiaries 13
Patients 13
Doctors and Nurses 13
Management 13
CHAPTER 2: LITERATURE REVIEW 14
Introduction 14
2.1 Description of the current System 14
2.2. St. Joseph's Mission Hospital Patients Record Management System 16
i. Easy Usability 16
ii. Reliability 16
iii. Programming Logic 17
iv. Database 17
v. Secure user-login and management interface 17
2.3. Related Systems (Existing Systems) 17
2.3.1. Chronic Patient's Management System 17
2.3.2. Patient's Management Software 18
2.4. Types of Record Management Systems 19
2.5. Conclusion 20
CHAPTER 3: METHODOLOGY 21
3.1 Overview 21
3.2. Literature Review 22
3.3. Requirements Determination 22
3.3.1 System Study 22
3.3.2 Observations 22
3.3.3. Interviews 23
3.3.4 Questionnaires 24
3.4 System Design 24
3.5. Software Implementation 25
i. Visual Basic .Net 26
ii. Database 26
iii. User Interface 26
3.6 Testing and Validation 27
3.7. Project Schedule 28
3.8. Budget Estimates 29
CHAPTER 4: SYSTEM REQUIREMENT SPECIFICATIONS 30
4.1 Introduction 30
4.2. Purpose 30
4.2.1 Intended Audience 30

4.3. Project Scope 31
4.4. Overall Description 31
4.5. User Classes and Characteristics 31
4.6. Operating Environment 33
4.7. Design and Implementation Constraints 34
4.8. User Documentation 34
4.9. Assumptions and Dependencies 35
4.10. Functional Requirements 35
REQ-1: Admission Add Patients 35
Assign ID 35
REQ-2: Consultation Assign to Waiting List 35
Assign Ward 35
REQ-3: Medical Matter Management Assign Doctor 36
Assign Nurse 36
REQ-4: Checkout 37
REQ-5: Report Generation 37
REQ-6: Database 38
4.11. External Interface Requirements 39
4.11.1User Interfaces 39
This is the interface between the software and the user. 39
4.11.2. Hardware Interfaces 39
4.11.3. Software Interfaces 40
4.11.4. Communication Interfaces 40
4.12. Other Non-Functional Requirements 41
4.12.1 Performance Requirements 41
4.12.2. Security 41
4.12.3 Maintainability 42
4.12.4. Reliability 42
CHAPTER 5: DESIGN SPECIFICATIONS 43
5.1. Purpose and Scope 43
5.2. System overview 44
5.3. System Architecture 46
5.3.1 Hardware Architecture 46
5.3.2. Software Architecture 47
5.4. Software Design 47
5.5. File and Database Design 50
5.6. Human Machine Interface 53
5.7. System Integrity controls 59
CHAPTER 6: TEST RESULTS AND CONCLUSION 61
6.1. Introduction 61
6.1.2. Purpose 61
6.1.3. Objectives 61
6.1.4. Statement Scope 61
6.1.5. Major Constraints 62
6.2. Test Plan 62
6.2.1 Software to be tested. 62
6.2.2. Testing Strategy 62
6.2.3. Testing resources and staffing 63
6.2.4. Test Work Products 64
6.2.5. Test Record Keeping 64
6.2.6. Test Metrics 64
6.2.7. Testing Tools and Environment 64
6.2.8. Test Schedule 65

6.3. Test Procedure 65
6.3.1. Software to be tested 65
6.3.2. Testing Procedures 65
6.3.3. Test Resource and Staffing 68
6.3.4. Test Work Products. 68
6.3.5. Test Record Keeping and test logs 69
REFERENCES 70

CHAPTER 1: INTRODUCTION

St Joseph's mission hospital patient's record management system is a fully fledged system aimed to manage the information of all patients in the hospital and their service process. Its main goal is to streamline the flow of information across the hospital towards effective decision making for the patients in an efficient manner.

The hospital has three departments (the outpatient department, the in-patient department and the medical department). Services offered include casualty, ambulance, maternal health, day care surgeries, admission, discharges and transfers. Operation theater, wards, nursing, pharmacy, physiotherapy, eye clinic and the dental clinic. The proposed system will enhance efficiency in the delivery of the services mentioned above due to the ease at which the records will be stored and accessed.

1.1. Background

St. Joseph's Mission Hospital-Migori is a hospital dedicated to providing medical treatment for illness to migori county residents and patients outside Migori county. The hospital was founded at St. Joseph Catholic Parish, Migori Town in 1974 by Rev. Fr. Knap with the aim of improving the healthcare of Migori residents. Since then, the number of patients visiting the hospital has dramatically increased resulting in a slow delivery of services due to a lot of writing by the doctors and nurses.

1.2. Problem Statement

St. Joseph's Hospital is using a manual process to provide health services e.g. files and cards to track the records of continuing patients and setting up records for new patients in the hospital. This process has encountered various inconveniences such as files being misplaced and patients losing their health cards. Hence, an automated system will help keep track of the patient's records and their bills making it easy to determine the state of new and continuing patients.

1.3. Objectives

1.3.1 Main Objective

To implement a system that will enable St. Joseph's Mission Hospital to keep track of their patient's records.

1.3.2 Specific Objective

I. To study the manual records currently used in St. Joseph's Mission Hospital so as to obtain the system requirements with the objective of coming up with a functional Patient's Record Management System.

II. To design a model that will include the user requirements and the design specifications.

III. To implement a working Patient's Record Management System for St. Joseph's Mission Hospital.

IV. To test and validate the working Patient's Record Management System

1.3.3 System Objectives

I. Storage and backup of patient's information

II. Making available of the patient's information whenever needed.

III. Provide security and confidentiality of patient's data and records.

IV. Enable allocation of patient's to available doctors

1.4. Scope

This project will focus on implementing a system that will be used by St. Joseph's Mission Hospital to easily keep track of every patient's records.

1.5. The Importance of the Problem

The manual written process is time consuming and has a high degree of error and inconsistent layouts that keep changing to which the doctor's are not accustomed to. It has resulted in lack of enough storage to store hundreds of thousands of patient's records, lack of backups whenever physical files are damaged. With the development of the proposed system, the problems above will be solved because it will help to easily manage the patient's details.

The doctors will be able to easily follow the patient's records hence providing better prescriptions for the patients.

1.6. Beneficiaries

The developed system will be beneficial to the patient's, doctors, nurses and the management.

Patients

The system will ease the burden of carrying and safely keeping medical cards.

Doctors and Nurses

The system will help them to easily keep track of their patient's records. This will enable them to properly prescribe drugs to the patients and monitor their health.

Management

The system will help in keeping the overall operations hence improving service delivery

CHAPTER 2: LITERATURE REVIEW

Introduction

This chapter covers how the process in the hospital is currently carried out and the findings that were reviewed from various sources such as newspapers, online journals, magazines and the internet. It shows what other researchers had worked on, various systems used by different hospitals to automate their activities, various literature on different types of Patient's record Management Systems they operate on, their advantages, how they are managed and the value they bring to the hospitals.

2.1 Description of the current System

Accessing patient's records at St. Joseph's Mission Hospital is done manually at all the departments which is labor intensive and time consuming. There is a problem of patient's record retrieval and loss of the records because the nurses handle a large amount of records manually. This problem should be dealt with in order to provide better services for the patients in the hospital. The patients have also lost or misplaced their health cards hence they are not able to properly continue with their initial prescriptions that were stated in the lost cards.

Therefore, an automated system will enable the hospital to easily keep the patient's records and their medical bills. The following are the reasons why the manual process should be replaced with an automated system.

The current process encounters various problems such as:

I. Loss of patient's records and files due to misplacement and various disasters e.g. fire outbreaks

II. Time consuming. The process of capturing, analyzing, verifying details about patients, scheduling their appointments takes a lot of time.

III. The process is faced by human error caused by doctors in their prescription.

IV. Expensive. High administrative costs are encountered e.g. high stationary costs, printing patient's cards and large storage spaces required for the large amount of data.

St. Joseph's Mission Hospital should be able to easily keep track of the patient's records. Hence, the system will provide a mechanism for the doctors to easily retrieve the prescriptions made earlier thus avoiding making wrong prescriptions. The project will develop a Patient's Record Management System that will help St. Joseph's Mission Hospital to keep track of their patient's records.

2.2. St. Joseph's Mission Hospital Patients Record Management System

This is a system that will help keep track of all patient's records and enables easy access and retrieval of each patient's information.

2.2.1 The need for a Patients Record Management System

According to Encarta Dictionaries, a need is a pressing requirement of something in order to achieve a certain goal(Encarta Dictionaries, 2008). St. Joseph's Mission Hospital needs the proposed system in order to improve its service process. The system will enable the hospital to efficiently keep, track and retrieve the patient's records.

2.2.2 Features of a Patient Record Management System

According to Warken, a system that has different variety of features will make it suitable to the users in an organization (Warken A, 2009).

These features include:

i. **Easy Usability**

   This is the degree to which a given system assists the person using it to accomplish a specific task.

ii. **Reliability**

This is a measure of stability of a system

iii. Programming Logic

This consists of one server program, scripts used to validate data, perform calculations and navigate the users through the system. (Introduction to Programming Logic, 2009)

iv. Database

This is a shared collection of logically related data with their description designed to meet the needs of an organization.(Connolly & Begg, 2004). The database may consist of database tables or a set of flat files.

v. Secure user-login and management interface

The system should ensure the integrity and security of the information captured by implementing restricted logins and rights to particular entities given according to St. Joseph's Mission Hospital

2.3. Related Systems (Existing Systems)

2.3.1. Chronic Patient's Management System

This is a system developed to manage Chronic Diseases.

This system consists of two main elements:

a) **A virtual cooperative working space** to help coordinate and place all professionals of the multidisciplinary care team at different hospitals. All of them having a common target centered on the patient with a predefined plan and making use of various tools to optimize all the available resources.

b) **A multi-access system** to enable professionals and patients access to the services available and adapted to their needs

2.3.2. Patient's Management Software

This is a software used to acquire Medical Information from a medical device and used for the diagnosis of a patient. This software directly contributes to the treatment of a patient by performing analysis and the diagnosis functionality replacing the decisions and judgement of a physician.

This system is implemented on a server where multiple accesses can be done or runs on a desktop. It implements the use of QR codes to confirm payments and records patient's diagnosis results.

2.4. Types of Record Management Systems

	Patients Record Management System	Document Management System	Library Management System	Digital Imaging System
Effectiveness	☑			☑
Compliance	☑	☑	☑	
Completeness	☑			☑
Accuracy	☑		☑	
Accessibility	☑	☑		☑
Comprehensiveness	☑			☑
Security	☑	☑	☑	
Speed	☑	☑		☑
Authenticity	☑			☑

Different record management systems were reviewed and Patients Records Management System was adopted.

2.5. Conclusion

The proposed system will keep track of all patients, the hospital's information, enable doctors and nurses to easily access patient's records hence simplifying the management of patient's information.

The manual system will be replaced by the new system which is more efficient, saves time and works under all conditions.

CHAPTER 3: METHODOLOGY

3.1 Overview

This chapter focuses on different methodologies for the research project and the system design methods to be used. The main goal is to implement a project that will be used by St. Joseph's Mission Hospital to organize and keep track of the patient's Records.

A literature review of the existing systems with the same functionalities is performed in the first section with the aim of obtaining the shortcomings of the current system.

In the second section, system requirements are addressed followed by the design techniques then the techniques used to implement a Patients Record Management System and lastly the testing and validation section.

3.2. Literature Review

Review existing literature and the current system will be achieved through observation, conducting interviews, examining documents, conducting research and questionnaires. Examining documents is preferred for verification of facts collected and the information about the existing system.

3.3. Requirements Determination

3.3.1 System Study

The objective of system study is to obtain the requirements for designing St. Joseph's Patient's Record Management System. A system analysis and study for St. Joseph's Mission Hospital will carried out.

3.3.2 Observations

An observation on how doctors and nurses do prescriptions for patients daily will be done to examine the process that takes place in order to execute various activities. Researchers will interact with the current system and give a detailed report.

Reasons for using the observation method are as follows:

a. To collect different types of onsite data over a given period of time
b. To obtain a source of questions that can be addressed to St. Joseph's Mission Hospital's management.
c. To get a feel on how different things are prioritized and organized throughout the entire process.

3.3.3. Interviews

This is a conversation between two or more people whereby questions are asked by the interviewer in order to obtain information from the interviewee. (Free dictionary, et al, 2021). Interviews will be carried out on various groups e.g. St. Joseph's Mission Hospital's Staff.

Interviews are used because:

- They enable the interviewer to document the personalities the St. Joseph's Mission Hospital's management and staff.
- They will help expand the understanding of hospital operations hence aid in the collection of system requirements.

3.3.4 Questionnaires

This are forms containing a set of questions addressed to a number of subjects in order to gather information for a survey. (Free dictionary, 2021). Questionnaires will help in capturing data from individuals in the shortest time possible. They will help confirm the data collected using observation and interviews.

The following are advantages of the questionnaires methods:

- They are familiar to most people because nearly every person has had some experience completing questionnaires.
- They reduce bias because the researcher's opinion will not influence the respondent to answer questions in a certain manner thus offers great anonymity.
- They are easy to analyze once completed.

3.4 System Design

The objective of System analysis and Design of the proposed system will be achieved by designing a database using physical, conceptual and logical design of the database.

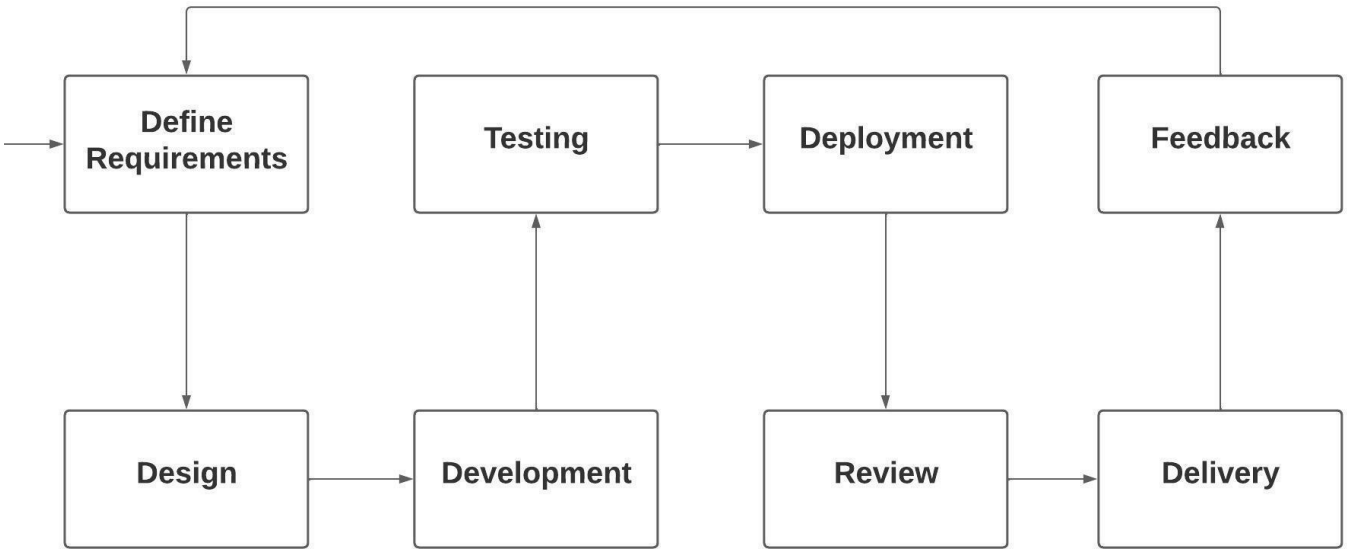
Data collected will be analyzed and integrated using an Entity Relationship Diagram and an Enhanced Entity Relationship Diagram.

Tools such as Microsoft Visual studio will be used in the development. Microsoft Project Professional will be used to present time schedules for task dissemination, ordering and the development procedures.

3.5. Software Implementation

Software Implementation will be achieved by the use of Agile Architecture

Agile Development Methodology



The system will be developed using Visual Basic.Net and MySQL

i. Visual Basic .Net

I chose Visual Basic.Net because it enables quick development of an application, creation of the client's interface, its very flexible and convenient. It also has advantages that falls under Object Oriented Programming Languages. Features of the objects in the program can be added independently without the need of reorganizing the system.

ii. Database

The system will have a database on which the entire application will be based on. MySQL will be used as a database to store all the patient's information.

iii. User Interface

The user interface will provide the means by which the user will interact with the system. The interface will connect with the database. The Interface will be developed using Visual Basic.Net

3.6 Testing and Validation

Testing and validation of the system will be done via integration testing. The modules of the application will be grouped together and tested as a whole in order to test the functionality of the user interface and the database.

Test data will be filled in the required fields and check if the system realizes the expected output upon execution. This will help in recognizing whether the functionality of the system has been achieved and check for any errors.

Validation of the system will be done by deploying the system on various computers and actual users should be able to interact with the system and provide an actual feedback.

3.7. Project Schedule

This is an estimate of the duration of each task in hours. A work breakdown schedule will be formulated and a task schedule prepared.

Task No.	Planned Start Date	Actual Start Date	Planned Completion Date	Actual Completion Date	No Of Hrs
Proposal	25/09/2021	30/09/2021	3/10/2021	_	12
Srs	4/10/2021	_	6/10/2021	_	24
Design	7/10/2021	_	14/10/2021	_	42
Test Plan	15/10/2021	_	19/10/2021	_	24
Implementation Plan	20/10/2021	_	14/11/2021	_	84
Maintenance Plan	14/11/2021	_	15/11/2021	_	6
User Manual	16/11/2021	_	17/11/2021	_	6
Final Report	17/11/2021	_	18/11/2021	_	7

3.8. Budget Estimates

Item	Quantity	Amount	
Stationary	_	400	
Word Processing and Printing	_	300	
Photocopying	_	200	
Data Analysis	_	200	
Binding Books 4	100 @	400	
Laptop		40000	
Ethernet Cables		1000	
Computer		32000	
Electricity		1000	
Grand Total		**75,000**	

CHAPTER 4: SYSTEM REQUIREMENT SPECIFICATIONS

4.1 Introduction

This is a system requirement Specification document for St. Joseph's Mission Hospital Patient's Record Management System. It describes the functions and goals that the system can perform. This will be used to describe the scope of the project and plan the system's design and implementation.

4.2. Purpose

The purpose of this document is to describe all the requirements of St. Joseph's Mission Hospital Patient's Record Management System.

4.2.1 Intended Audience

The following are some of the system's intended audience:

- Administrative staff
- Doctors
- Nurses
- Surgeons
- Clients
- Development team
- Supervisor

The hospital management and its team members use this documents as a means to communicate the system requirements to the development team. The development team will conduct conversations about system requirements and ideas for the requirements. Only the requirements stated in this document or a future revision will be used to define the scope of the system.

4.3. Project Scope

The software product is a Patient's Record Management System. The system will be used to register patients, manage admissions and perform the overall management of all departments. These functions will be performed with a high degree of accuracy. The modules of the St.
Joseph Patient's Record management system are user-friendly and easy to access.

The intentions of the system is to store and manage patient's records. This will help doctors to easily correctly diagnose patients and prevent the loss of patient's records due to the use of physical cards.

4.4. Overall Description

St Joseph Patient's Record Management System is a system that will be used to manage all patient's records. The system will enable smooth healthcare performance along with medical, legal, financial and administrative operations. Hence successful operation of St Joseph's Mission Hospital.

4.5. User Classes and Characteristics

The system will be used in St Joseph Mission Hospital by the Administrative staff, the doctors, nurses and the front-desk staff. Some of the user's may not be computer literate, hence there will be a need to train them on using the system. The system is designed to be user-friendly.

Administrative staff

- ✓ They all have a basic computer training
- ✓ Responsible for all the scheduling and updating of the the day/night employee shift
- ✓ Responsible for assigning doctors and nurses to patients.
- ✓ Have a post-secondary education relating to general business administration practices.

Nurses

- ✓ Are computer literate
- ✓ Have a post-secondary education in nursing.
- ✓ Responsible for assigning patients to available wards
- ✓ Patient's give short descriptions of their conditions
- ✓ They check their patient's list

Front-desk staff

- ✓ Have general reception and secretarial duties.
- ✓ Have some basic computer training.
- ✓ Responsible for patient's check-in.
- ✓ Notify administrators or nurses when an event occurs.

Doctors

- ✓ All have a medical degree
- ✓ Are computer literate.
- ✓ Use the system to check their patient's list.
- ✓ Record patient's diagnosis.

4.6. Operating Environment

The software will operate on a hardware platform and an operating system.

Hardware Platform

The development will be done on a HP laptop, Intel Processor, Core i5 7th Gen. The laptop has an 8 GB RAM and a 2.7 GHz processor speed.

The system will operate on a hardware platform with the following minimum requirements:

- ✧ 4 GB RAM
- ✧ Intel Processor
- ✧ Core i3 5th Gen
- ✧ 1.9 GHz processor speed.

Operating System

The development is done on a windows 10 operating system.

The system will operate on from windows 7 operating system and above.

4.7. Design and Implementation Constraints

The system should:

- ✓ Ensure the integrity of the patient's information.
- ✓ Make information accessible even in concurrent patient consultation.
- ✓ Be able to handle a significant number of transactions at any given time.
- ✓ Guarantee speed of data display.
- ✓ Support a high rate of concurrent transactions.
- ✓ Anticipate difficulties and limitations regarding system upgrades and improvements.

4.8. User Documentation

The following are some of the user documentations that will be delivered along with the software.

- ■ User manuals
- ■ Release notes
- ■ Installation guides

4.9. Assumptions and Dependencies

- ✓ It is assumed that the end users will be there to test the system.
- ✓ Compatible computers will be available before the system is tested and installed.
- ✓ The estimated budget is available to facilitate the system development.

4.10. Functional Requirements

REQ-1: Admission

Add Patients

The system will allow the front-end desk staff to add new patients.

Assign ID

Front-end staff will assign the patient's their ID that corresponds their national ID. For patient's below the age of 18 years, they will use their birth certificate number.

REQ-2: Consultation

Assign to Waiting List

The consulting nurse will assign patients to a waiting list if no bed is available.

Assign Ward

The consulting nurse shall assign the patients to an appropriate ward.

REQ-3: Medical Matter Management Assign

Doctor

The administrative staff shall assign a patient to a doctor

Assign Nurse

The administrative staff shall assign a patient to a nurse.

Inform Nurses

The system shall inform nurses of new patients

Inform Doctors

The system shall inform doctors of new patients

Surgery Case

The administrative staff shall use the system to assign a surgery room, surgeon and nurses to the patient.

Emergency Case

The administrative staff shall use the system to assign an emergency room, doctors, and nurses to the patients immediately.

Generate Report

The system shall generate the patient's situation record

Inform Patients

The system shall inform patients of the people on the bed's waiting list and their status.

REQ-4: Checkout

Delete Patient ID

The administrative staff shall delete the patient ID when they checkout.

Add to beds-available list

Administrative staff shall put evacuated beds in the beds available list.

REQ-5: Report Generation

Patient Information

The system shall generate the patients reports about the following information: patient's ID, name, ward name, bed number, and the doctor's name.

Bed Availability

The system shall generate reports on the available beds.

Staff Schedule

The system shall generate reports on staff schedule

The report includes: staff ID, staff name, staff type, staff duty.

REQ-6: Database

Patient's Mandatory Information

Each patient shall have the following mandatory information: first name, last name, phone number, ID number, address, postal code, city, country,

Update Patient information

The system shall enable update of the patient's information

Search for patients

The system shall allow searching for a patient

Staff Mandatory information

Each staff shall have the following mandatory information: ID number, first name, last name, phone number, address, city, country, duty schedule, employee type.

Update Staff information

The system shall enable update of the staff information

Search of Employee information

The system shall enable search of the employee information

Ward Types

Types of wards, Cancer, cardiac, maternity and surgical wards.

Room information

Each room will include: room number, list of beds, full/not full. Bed information

Each bed includes:

Bed number, occupied/not occupied, patient's ID

4.11. External Interface Requirements

4.11.1User Interfaces

This is the interface between the software and the user.

- Registering Patients
- Registering Doctors
- Registering Nurses
- Allocating patients to doctors and nurses.
- Allocating patients to wards and beds
- Recording patients fees

4.11.2. Hardware Interfaces

This is the logical and physical characteristics of each interface between the software and the hardware components of the system.

- **Hardware required**

  CPU Requirements

  - ✓ Core i3 and above processor
  - ✓ 5th generation and above
  - ✓ 4GB Ram and above
  - ✓ 1.9 GHz and above
  - ✓ 500 GB Hard disk and above

  Monitor

  Keyboard

  Mouse

- **Supported devices**

The software is developed only for windows 32-bit or 64 bit.

- **Nature of data and control interaction between the hardware and the software**

The administrators can only access the system by providing their login credentials.

4.11.3. Software Interfaces

The system is developed for windows 7, windows 8 and windows 10 The

system will use VB net for the user interface.

It will store all the data with the use of MySQL.

4.11.4. Communication Interfaces

The system synchronizes with MySQL to store all the information concerning all the patient's.

4.12. Other Non-Functional Requirements

4.12.1 Performance Requirements

Response time

System shall give responses in 1 second after checking the patient's information.

Capacity

The system should support 1500 people at a time

User Interface

The screen should respond within 3 seconds

Conformity

The system should conform to Microsoft accessibility guidelines to be able to use VB Net.

4.12.2. Security

Patient Identification

The system will require the patient to identify himself using an ID number.

Login ID

Any administrator who uses the system should have a login ID and a password.

Modification

Any modification shall be done only by the administrative staff.

Front Desk Staff rights

Front desk shall add new patients but not be able to modify the patient's records.

Nurse's Rights

Only view the information in the system

Doctor's Rights

Only view all the information in the system.

4.12.3 Maintainability

Backup

The system should provide capability to backup the data

4.12.4. Reliability

Availability

The system should be available all the time.

CHAPTER 5: DESIGN SPECIFICATIONS

5.1. Purpose and Scope

Purpose

The purpose of this document is this section is to give a detailed plan for developing for developing St. Joseph's Mission Hospital Patient's Record Management system. This document tracks the necessary information required to define the system architecture and design in order to give a guidance on the architecture of the system to be developed.

Project Scope

The software product is a Patient's Record Management System. The system will be used to register patients, manage admissions and perform the overall management of all departments.These functions will be performed with a high degree of accuracy. The modules of St. Joseph Patient's Record management system are user-friendly and easy to access.

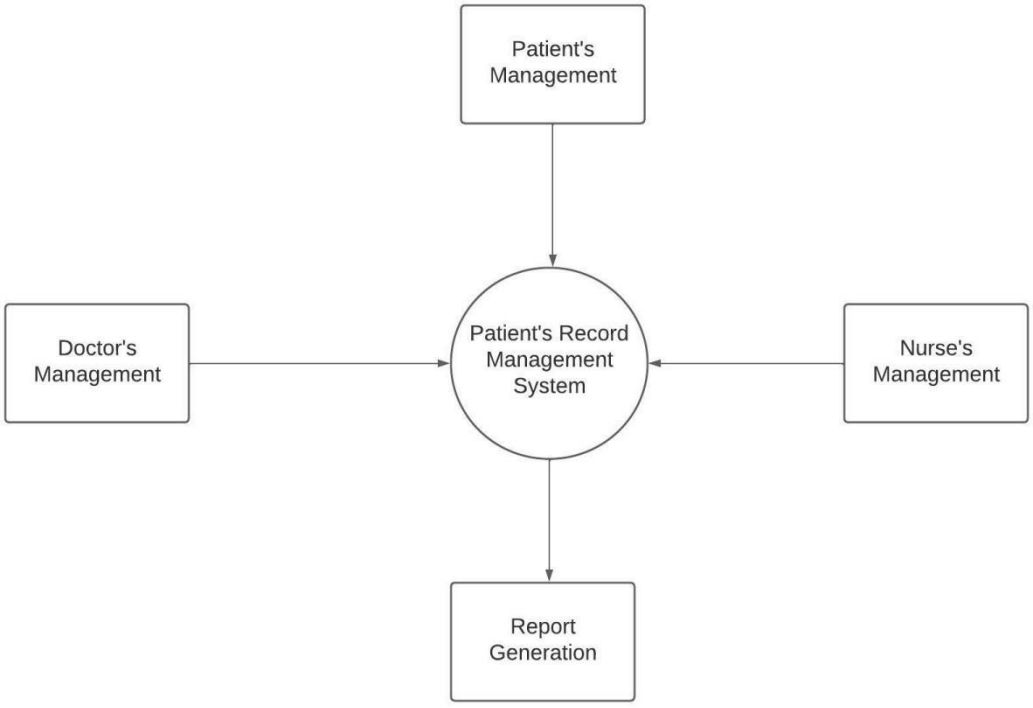
The intentions of the system is to store and manage patient's records. This will help doctors to easily correctly diagnose patients and prevent the loss of patient's records due to the use of physical cards.

5.2. System overview

St Joseph Patient's Record Management System is a system that will be used to manage all patient's records. The system will enable smooth healthcare performance along with medical,legal, financial and administrative operations. Hence successful operation of St Joseph's Mission Hospital.

a) Level 0 Data Flow Diagram (DFD)

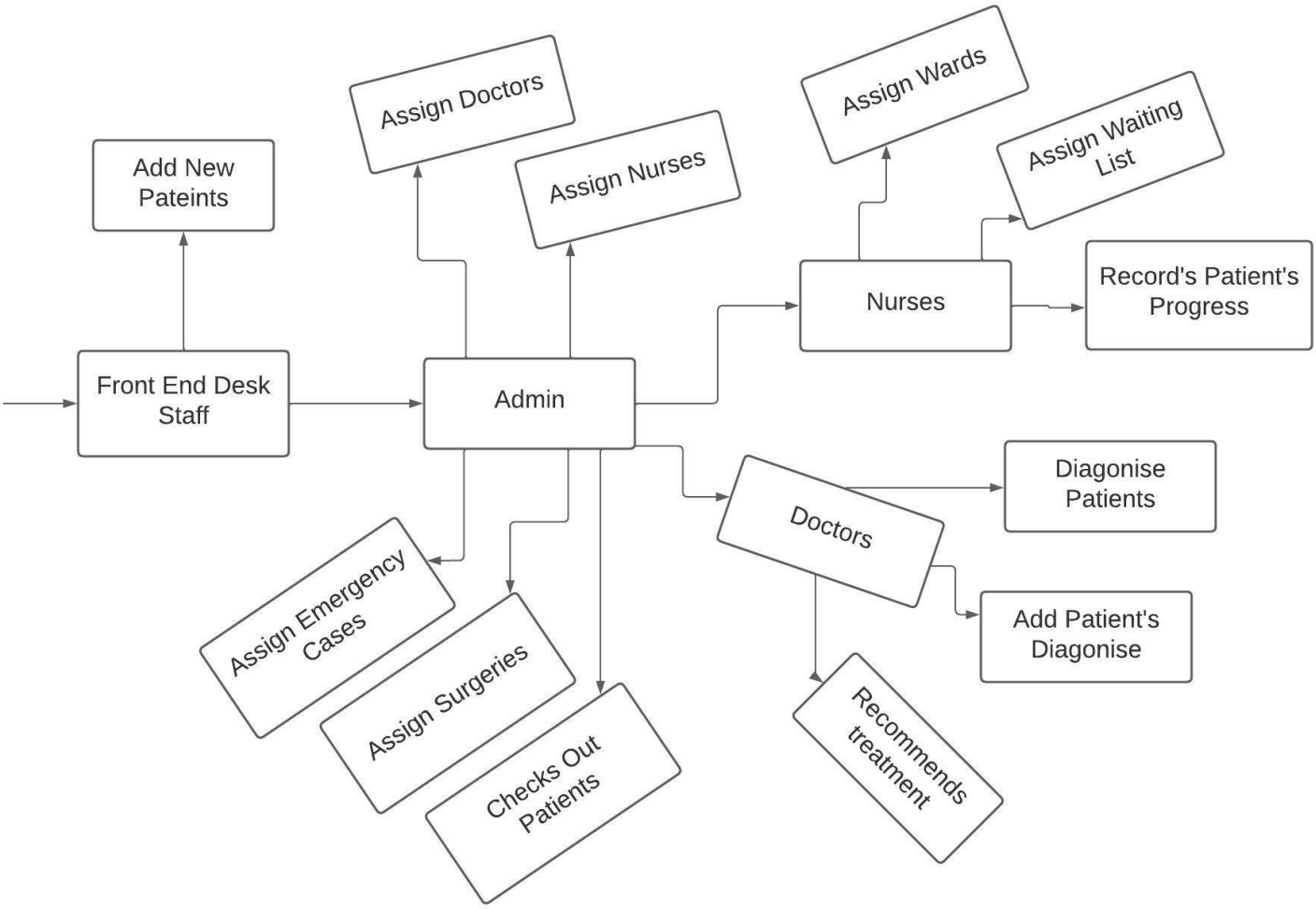
This diagram shows only a single process representing the entire system and all its associated external entities.



b) Level One Data Flow Diagram

This data flow diagram shows the general in the system process and the data stores.

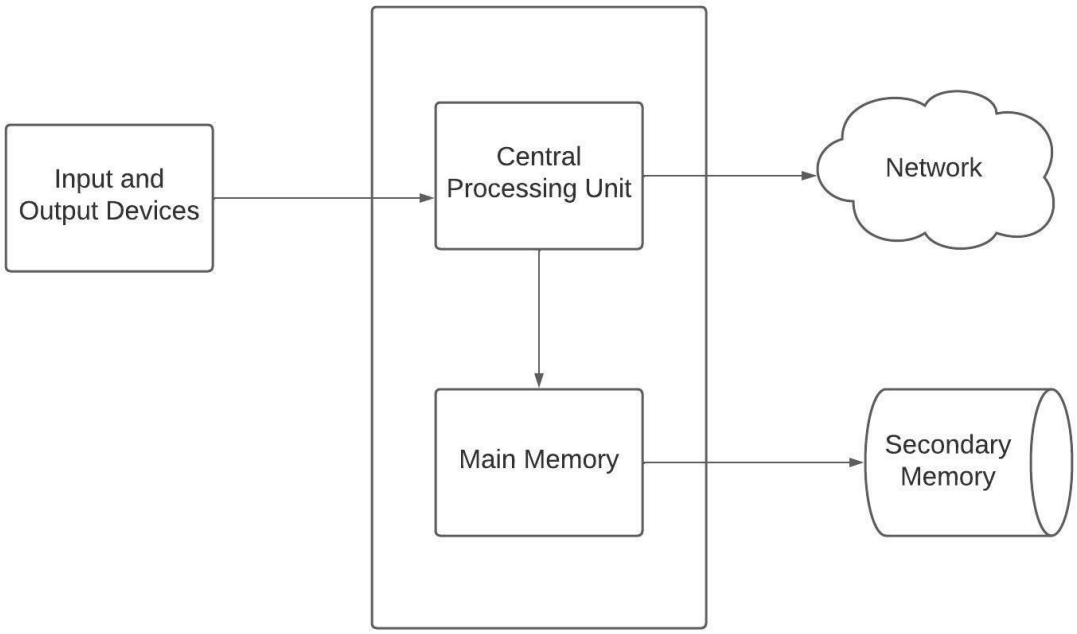
The diagram below shows a level one data flow diagram.



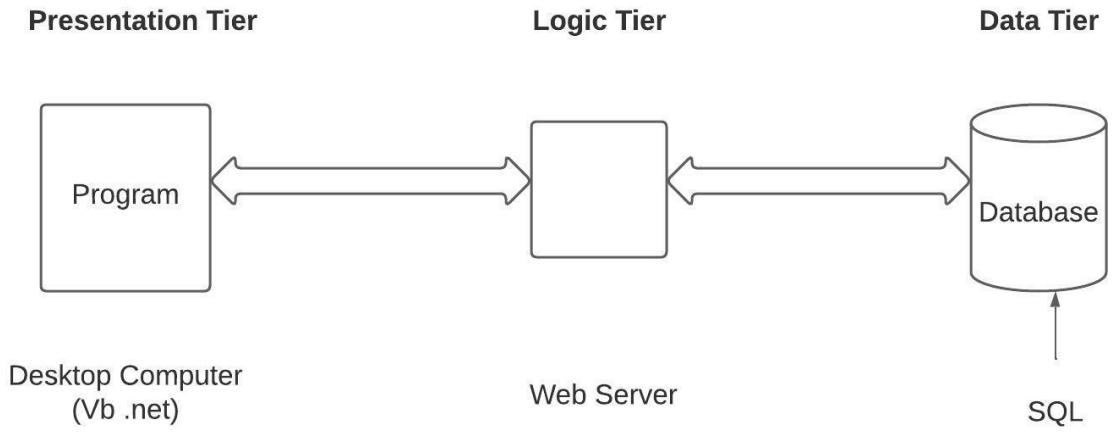
5.3. System Architecture

This section outlines the system and hardware architecture design of the system.

5.3.1 Hardware Architecture



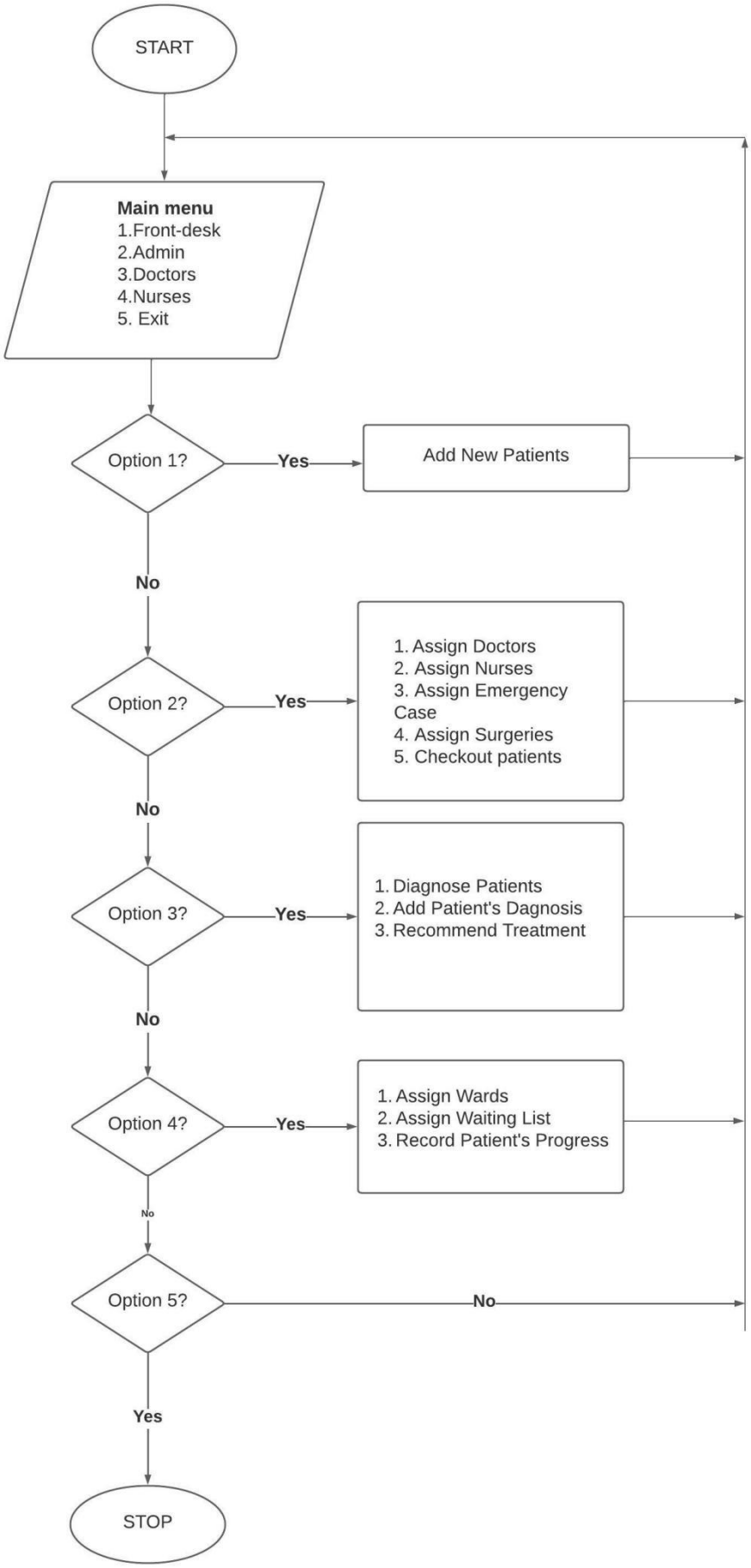
5.3.2. Software Architecture



5.4. Software Design

The system consists of various modules. The following section provides detailed logic and data necessary to completely write the source code for all modules in the system.

Program Flow Chart


START
Main menu
1.Front-desk
2.Admin
3.Doctors
4.Nurses
5. Exit
Option 1?
Yes
Add New Patients
No
Option 2?
Yes
1. Assign Doctors
2. Assign Nurses
3. Assign Emergency Case
4. Assign Surgeries
5. Checkout patients
No
Option 3?
Yes
1. Diagnose Patients
2. Add Patient's Dagnosis
3. Recommend Treatment
No
Option 4?
Yes
1. Assign Wards
2. Assign Waiting List
3. Record Patient's Progress
No
Option 5?
No
Yes
STOP

Pseudo code

DO Select_From_Main_Menu

IF Front_desk THEN

DO Add_New_Patients

ELSE IF Admin THEN

DO Assign_Doctors, Assign_Nurses, Assign_Emergency_Cases, Assign_Surgeries,

Checkout_Patients

ELSE IF Doctors THEN

DO Diagnose_Patients, Add_Patient's_Diagnose, Recommend_Treatment

ELSE IF Nurses THEN

DO Assign_wards, Assign_Waiting_List, Record_Patient's_Progress

ELSE IF Exit THEN

Close Program

ENDIF

ENDIF

ENDIF

ENDIF

ENDIF

5.5. File and Database Design

This section reveals the file design of the database management system.

Patient's Information

Variable	**Variable Name**	**Variable Type**	**Variable Width**	**Values**
Patient's ID	ID	Numeric	20	001-900
First Name	FIRST NAME	char	30	A-Z
Last Name	LAST NAME	char	30	A-Z
Birthday	DOB	dd/mm/yy		1-31/1-12/1900-2022
Gender	GENDER			Male, female
Home Address	ADDRESS	char		
Date Added	DATE ADDED	dd/mm/yy		1-31/1-12/1900-2022
Bed No				
Doctor's ID				
Nurse's ID				
Ward ID				
Diagnose Information				
Progress				

Doctor's information

Variable	Variable Name	Variable Type	Variable Width	Values
Doctor' ID	ID	Numeric	20	001-900
First Name	FIRST NAME	char	30	A-Z
Last Name	LAST NAME	char	30	A-Z
Birthday	DOB	dd/mm/yy		1-31/1-12/1900-2022
Gender	GENDER			Male, female
Home Address	ADDRESS	char		
Date Added	DATE ADDED	dd/mm/yy		1-31/1-12/1900-2022

Nurse's Information

Variable	Variable Name	Variable Type	Variable Width	Values
Nurse's ID	ID	Numeric	20	001-900
First Name	FIRST NAME	char	30	A-Z
Last Name	LAST NAME	char	30	A-Z
Birthday	DOB	dd/mm/yy		1-31/1-12/1900-2022
Gender	GENDER			Male, female
Home Address	ADDRESS	char		
Date Added	DATE ADDED	dd/mm/yy		1-31/1-12/1900-2022

Ward Information

Variable	Variable Name	Variable Type	Variable Width	Values
Ward ID	ID	Numeric	20	001-900
Ward Name	WARD NAME	char	30	A-Z
Number of Beds	NO. Of Beds	Numeric	30	1-100

Bed Information

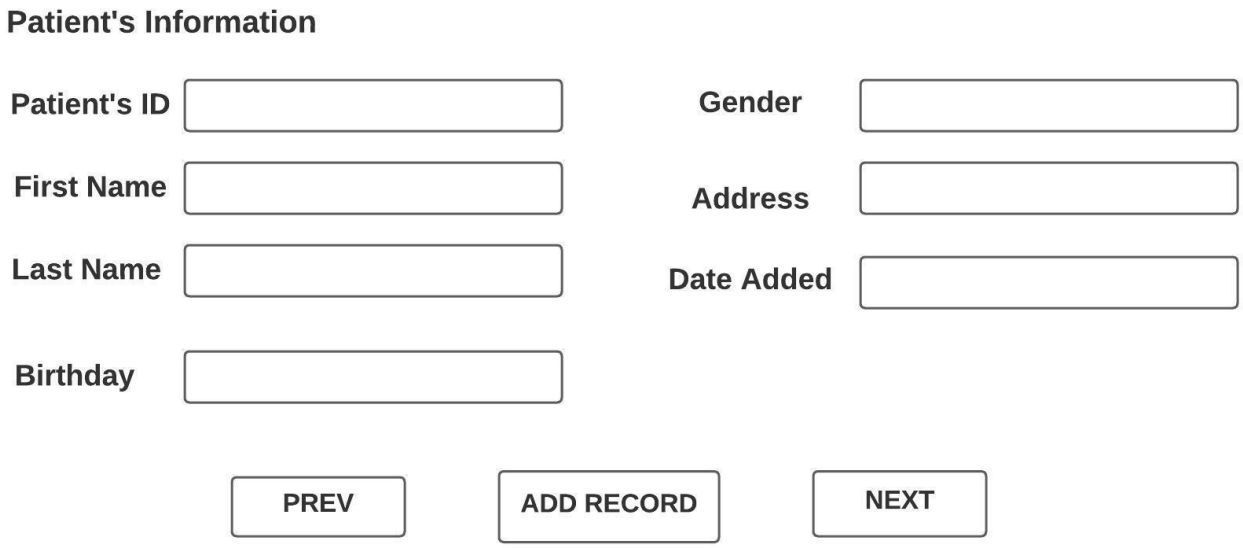
Variable	Variable Name	Variable Type	Variable Width	Values
Bed ID	ID	Numeric	20	001-900
Ward ID	Ward ID	char	30	001-900

5.6. Human Machine Interface

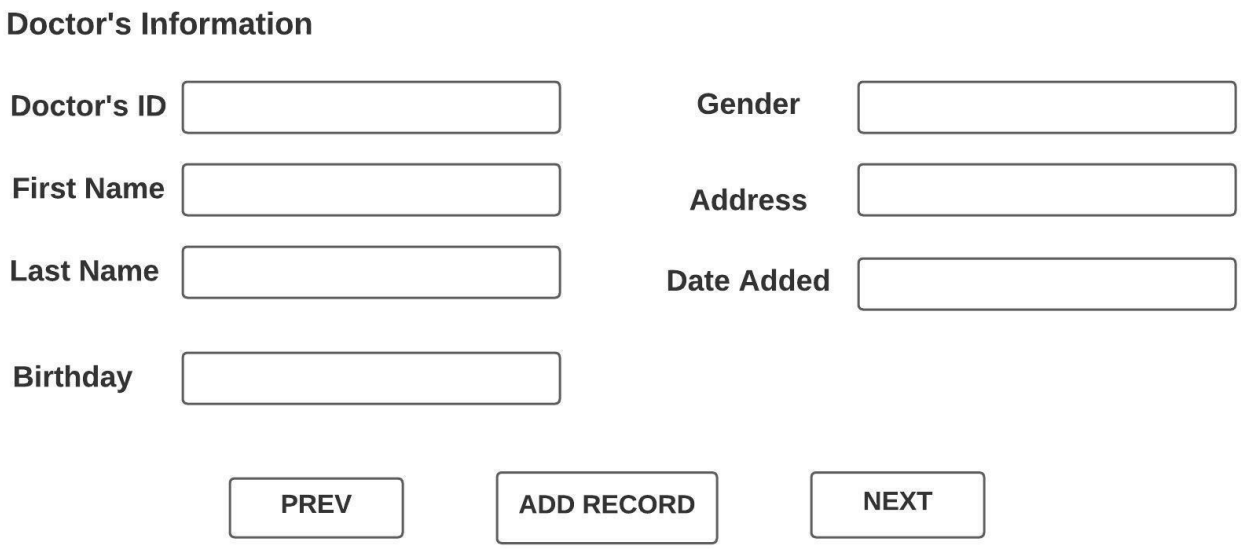
This sections provides the detailed design of the system's input and output designs.

i. System Input Design

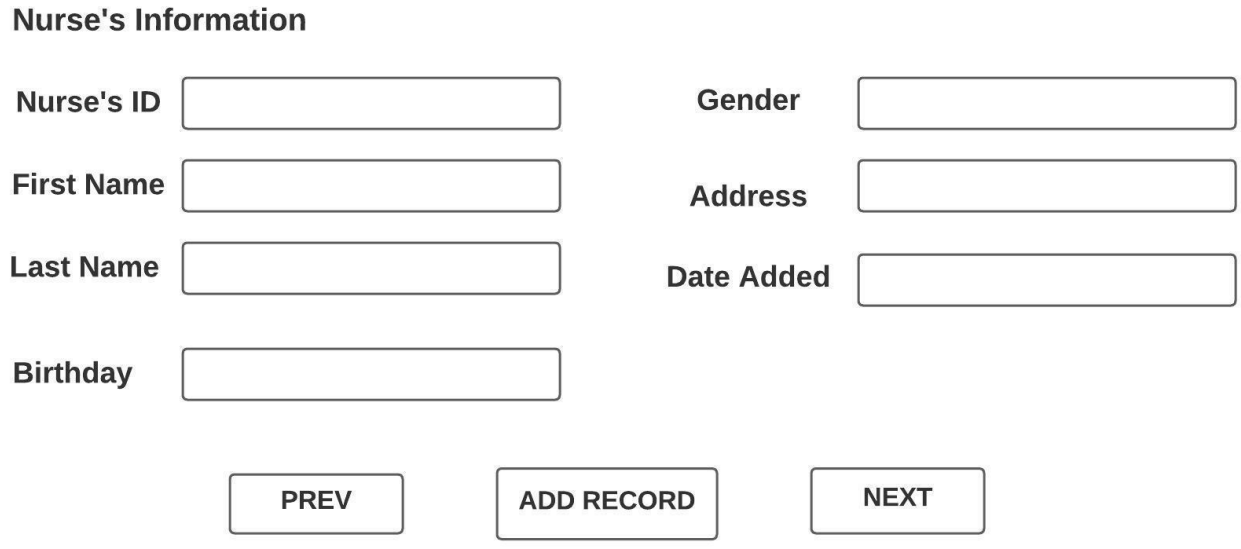
Patient's Information Form



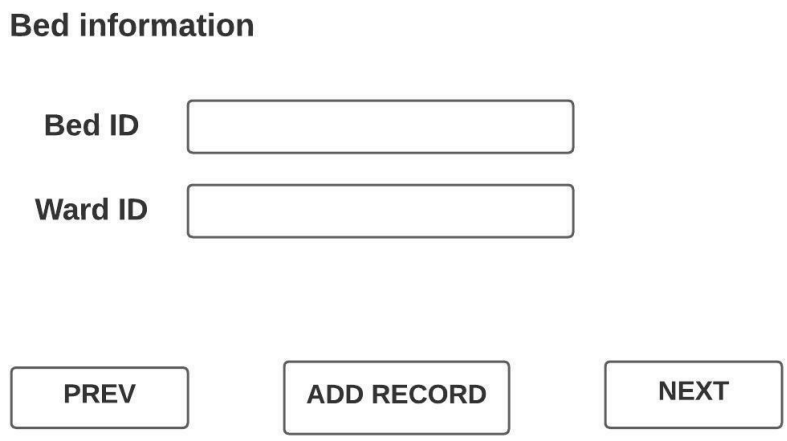
Doctor's Information form



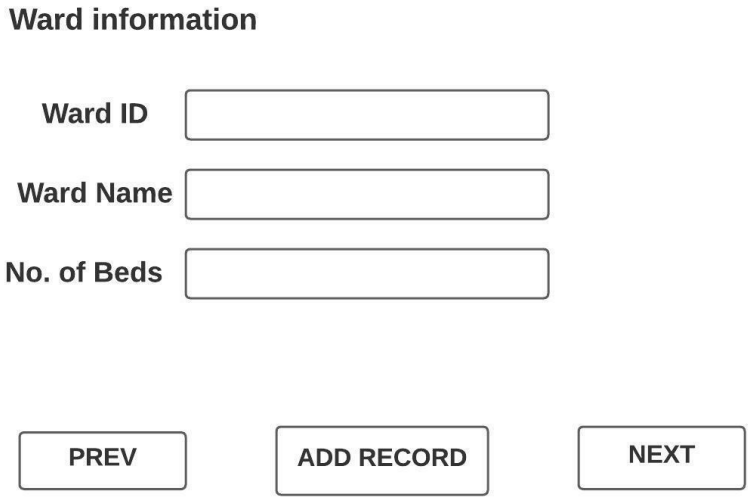
Nurse's Information form



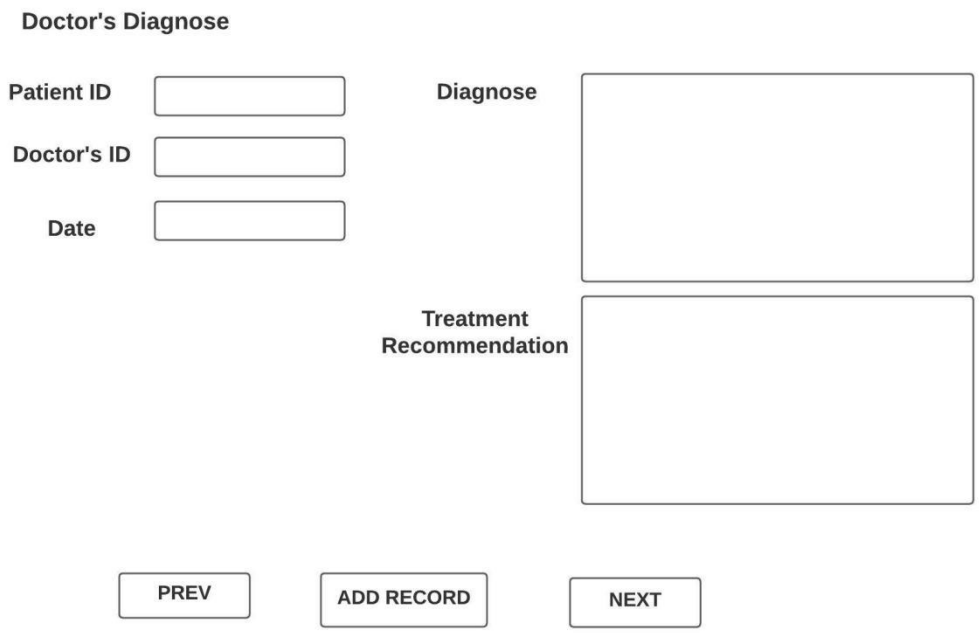
Bed Information Form



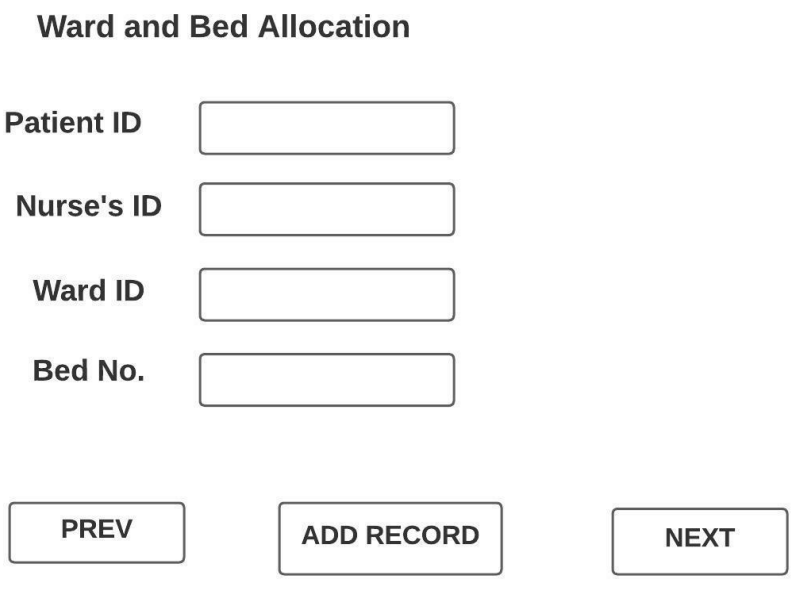
Ward Information Form



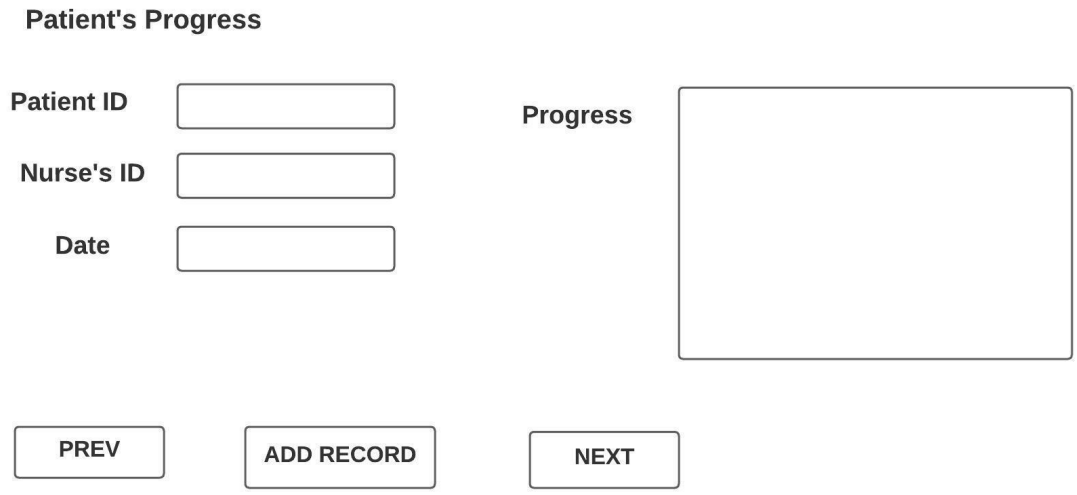
Doctor’s Diagnose Form



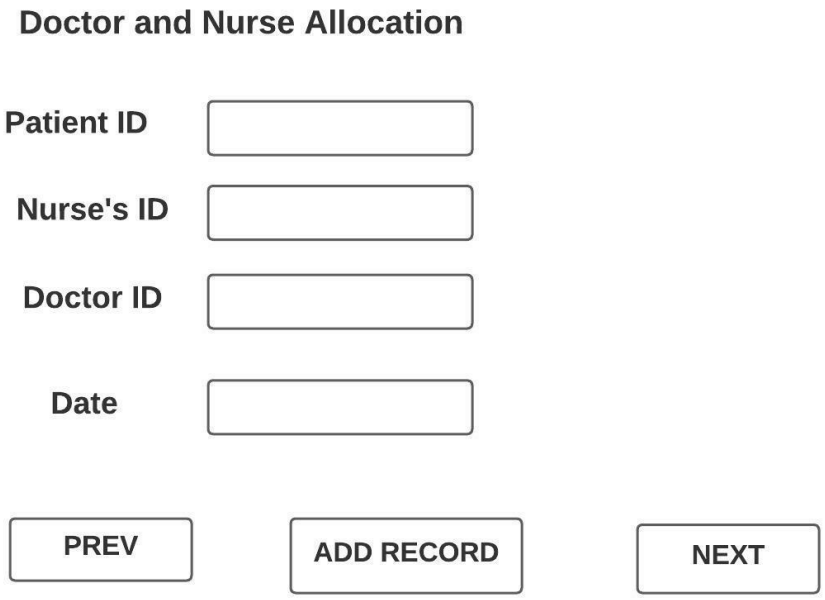
Bed and Ward Allocation Form



Patient's Progress Form



Doctor and Patient Allocation



ii) System Output Design

Patients in the Hospital

Patient's ID	First Name	Last Name	Birthday	Age	Gender	Address	Date Reported

Patient Allocation to doctors

Doctor's ID	Patient ID	First Name	Last Name	Age	Gender

Patient Allocation to Nurses

Nurse's ID	Patient ID	First Name	Last Name	Age	Gender

Patient's Ward and Bed No

Ward ID	Patient's ID	First Name	Last Name	Gender	Bed No

Patient's and their diagnose

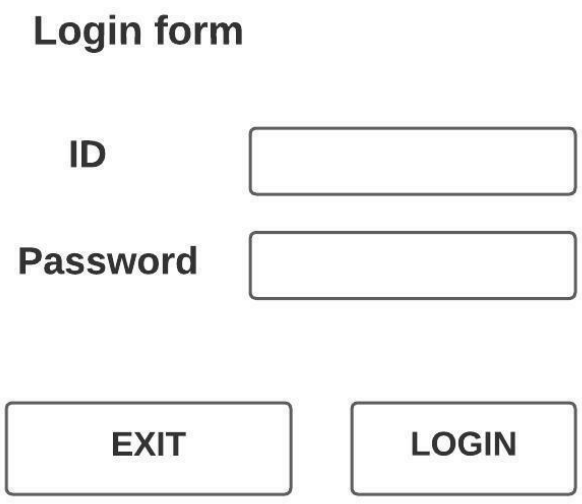
Doctor's ID	Patient's ID	First Name	Last Name	Diagnose	Recommended Treatment	Date of Diagnose

Patient's and their Progress

Nurse's ID	Patient's ID	First Name	Last Name	Progress	Date

5.7. System Integrity controls

Login form



Admin credentials table

Admin ID	Passwords

Doctors credentials table

Doctor's ID	Passwords

Nurse's credentials table

Nurse's ID	Passwords

Front-end desk credential's table

Staff ID	Passwords

CHAPTER 6: TEST RESULTS AND CONCLUSION

6.1. Introduction

6.1.2. Purpose

The purpose of this document is give a detailed test plan for St. Joseph's Mission Hospital Patient's Record Management System. This document describes all the testing strategies that will be used to indicate that the system has met all the requirements by the hospital prior to its release.

6.1.3. Objectives

The objectives of the test plan is to ensure that:

- ✓ The system meets all the requirements specified by the hospital.
- ✓ Support the intended hospital's functions and achieves all the required software standards.
- ✓ The system satisfies the entrance criteria required for user-acceptance testing

6.1.4. Statement Scope

The software product is a Patient's Record Management System. The system will be used to:

- ✓ Register patients.
- ✓ Allocate patients to Nurses and Doctors
- ✓ Record patient's diagnosis
- ✓ Record Patient's Progress
- ✓ Allocate patient's to beds and wards

These functions will be performed with a high degree of accuracy. The modules of St. Joseph Patient's Record management system are user-friendly and easy to access.

The intentions of the system is to store and manage patient's records. This will help doctors to easily correctly diagnose patients and prevent the loss of patient's records due to the use of physical cards.

6.1.5. Major Constraints

- ✓ Lack of enough staff who have in-depth knowledge in system operation.
- ✓ Lack of enough computers to test the system

6.2. Test Plan

6.2.1 Software to be tested.

The system to be tested is St. Joseph's Patient Record Management system. This system uses Vb.Net for the user interface and MySQL for the Database.

6.2.2. Testing Strategy

St. Joseph's Mission Hospital's Patient Record Management System Testing will test all the functionalities stated in the system scope.

The system testing activities will include testing of the internal and external interfaces, workflows, validations, testing both new functionalities and modified functionalities.

6.2.2.1 Unit Testing

Small parts of the system will be tested starting with registering new patients, then allocation of patients to doctors and nurses, recording diagnosis, allocating patient's to beds and wards, recording patient's progress and finally clearing the patients from the hospital.

6.2.2.2. Integration Testing

The system processes will be combined and tested as group. Recording patient's diagnosis, allocating patient's to beds and wards and registering new patients will be run together to see how the system performs.

6.2.2.3. Validation testing

The system will be tested to check whether it meets the hospital's requirement. We will check whether the correct information is fed into the system, whether the outputs of various operations in the system are correctly done and whether the whole process of patient's record management is done as required.

6.2.2.4. High Order testing

Further tests will be conducted to test whether the system meets all the requirements. The system will be run on different operating systems to check whether it operates efficiently. The system will be operated by different users to check whether they will be able to use the system easily.

6.2.3. Testing resources and staffing

In order to test the system effectively, 20 computers will be required.

These computers should be running on a windows 10 operating system.

The computers should be running on a minimum of an 8 gb RAM, 500 GB Hard disk drive and a minimum of 2.5 GHz speed.

20 staffs comprising of doctors, nurses, front-end desk staff and administrators will be used in testing the system.

6.2.4. Test Work Products

The test work products of St Joseph's Patients Management System will involve automated tests, test plans, test cases, test strategy document, risk document, defect reports and test results

6.2.5. Test Record Keeping

The test records will be computerized.

Various reports of the system tests will be generated from the system. The observations will be written down and recommendations stated incase there is need to make any changes in the systems.

The records will be kept on excel sheets and word documents.

6.2.6. Test Metrics

These metrics will be used to measure and monitor the test activities.

The test metrics include:

- ✓ No. Of bugs per test = total number of defects/total number of tests
- ✓ Test design efficiency = Number of tests designed/total time
- ✓ Number of tests within a particular time period = Number of tests run/ Total time
- ✓ Test review efficiency = Number of tests reviewed / Total time

6.2.7. Testing Tools and Environment

The system will be run on HP computers. These computers will contain an installed Windows 10 Operating System.

6.2.8. Test Schedule

Task Name	Duration	Start	Finish
Unit testing	2 days	20/11/2022	22/11/2022
Integration Testing	3 days	23/11/2022	26/11/2022
Validation Testing	1 days	27/11/2022	28/11/2022
High Order Testing	2 days	28/11/2022	30/11/2022

6.3. Test Procedure

6.3.1. Software to be tested

The software to be tested is St Joseph's Mission Hospital Patient's Record Management System.

6.3.2. Testing Procedures

St. Joseph's Mission Hospital's Patient Record Management System Testing will test all the functionalities stated in the system scope.

The system testing activities will include testing of the internal and external interfaces, workflows, validations, testing both new functionalities and modified functionalities.

6.3.2.1. Unit test Cases

Component parts of the system will be tested.

6.3.2.2. Stubs for Recording and Managing Patient's Records

- ✓ Register patients.
- ✓ Allocate patients to Nurses and Doctors
- ✓ Record patient's diagnosis
- ✓ Record Patient's Progress
- ✓ Allocate patient's to beds and wards

Test Procedure of Recording and Managing Patient's Records

- ✓ The staff inputs the required details in each of the stub
- ✓ The stubs are isolated to test them more rigorously
- ✓ The data input is checked to verify whether it meets the requirements
- ✓ The output information is checked to see whether its correct
- ✓ The workflow and testing results are recorded.

Purpose of Testing the patient's record management process

To check whether the system parts achieve the hospital's requirements independently

Expected Results

The Records of the patient's should be generated in a report I.e ID Number, Name, Bed Number, Ward, Doctor Assigned, Nurse Assigned, Diagnosis, Recommended Treatment, Progress

6.3.2.3. Integration Testing

The system processes are combined and tested as groups

Testing Procedures

- ✓ The staff inputs the required details in all of the system's parts
- ✓ The system parts are combined and tested together
- ✓ The data input is checked to verify whether it meets the requirements
- ✓ The output information is checked to see whether its correct
- ✓ The system parts are checked whether they can properly run together
- ✓ The workflow and testing results are recorded.

Purpose

To check whether the system parts can run together to meet the hospital's requirements.

The system should perform the required duties and produce the correct output.

Expected Results

The system parts are expected to run together to generate the patient's reports and keep the patient's information.

I.e ID Number, Name, Bed Number, Ward, Doctor Assigned, Nurse Assigned, Diagnosis, Recommended Treatment, Progress

6.3.2.4. Validation Testing

Testing Procedure

- ✓ The staff feeds various information into the system
- ✓ The system is checked to see whether it accepts only the information as per the requirements of the hospital and not all information.
- ✓ The output information is checked to see whether its correct.
- ✓ The workflow and testing results are recorded.

Expected results

The system is expected to accept the information as specified by the hospital.

The system is expected to reject the data that does not meet the hospital requirements and provide error messages on why it does not accept the data.

6.3.3. Test Resource and Staffing

The required machines are tested to see whether they perform as required.

Different system components are tested to see whether they can run succefully on the computers.

The hospital's staff are tested to check whether the can easily use the system

The workflows and various errors encountered are recorded.

6.3.4. Test Work Products.

The test work products of St Joseph's Patients Management System will involve automated tests, test plans, test cases, test strategy document, risk document, defect reports and test results

6.3.5. Test Record Keeping and test logs

Test results will be generated as reports from the system. The test processes and workflows will be recorded on excel sheets and word documents.

Other test information can be noted down on a sheet of paper.

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