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DBMS – MINI PROJECT REPORT ON

“BLOOD BANK & DONOR MANAGEMENT SYSTEM”

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CERTIFICATE

This is to certify that the presentation work entitled “**BLOOD BANK & DONOR MANAGEMENT SYSTEM**” is a bonified work carried out by student **SYED OWAIZ UZ ZAMAN (1GC21CS098)** of Ghousia College of Engineering in partial fulfilment for the award of Bachelor of Engineering in **Computer Science and Engineering** of the **Visvesvaraya Technological university, Belagavi** during the year **2023 – 2024**. It is certified that all the corrections/suggestions indicated for internal assessment have been incorporated in the presentation deposited in the department library. The Presentation deposited in the department library. The Presentation report has been approved as it satisfies the academic requirements in respect to the technical part prescribed for the above said degree.

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SYED OWAIZ UZ ZAMAN
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ABSTRACT

The Blood Bank and Donor Management System is a cutting-edge software solution tailored to streamline the operations of blood banks and enhance donor management processes. This comprehensive system integrates features such as donor registration, donor eligibility screening, blood inventory tracking, and real-time monitoring of blood availability. Its core objective is to optimize the efficiency of blood bank operations by centralizing donor information and facilitating seamless blood donation and distribution processes. By automating critical tasks like donor eligibility checks and blood typing, the system reduces errors, enhances accuracy, and ensures timely access to compatible blood products. With advanced reporting functionalities for donor demographics, donation history, and inventory levels, administrators can make data-driven decisions, allocate resources effectively, and maintain regulatory compliance. The implementation of this system promises improved operational efficiency, transparency, and safety in blood bank operations, ultimately leading to better donor management and patient care outcomes.

CHAPTER 1

INTRODUCTION

1.1. Overview

Blood Bank Management is a browser-based system that is designed to store, process, retrieve and analyse blood related information. This project aims at maintaining all the information pertaining to blood donors, different blood group available in this blood bank and help them to manage in a better way. This website provides the user or the donors a secured environment by accepting the log in ID's and password from the user.

This application allows the user to store the donor details as soon as the donor is registered. The admin will check the donor registered details if only he/ she is capable for donating the blood then only the donor can donate the blood at their registered centres. Before that the admin will send message or notification to donor registered mobile number or email.

1.2.1. General Overview of the Problem

The problems are:

- Tracking the database was complicated when the details are maintained manually.
- It is time consuming and space consuming.
- Scarcity of rare bloods.
- Unavailability of blood during emergency.
- Less awareness among people about blood donation and blood transfusion.

1.2 Feasibility study

Feasibility study aims to uncover the strength and weaknesses of the proposed project objectively and rationally. A feasibility study analyses the viability of a project to determine whether the project or venture is likely to succeed. The study is also designed to identify potential issues and problems that could arise while pursuing the project.

1.2.1. Technical feasibility

All the member of the group is familiar with PHP, so it helped us to work upon this project.

1.2.2. Schedule feasibility

The project has been chosen keeping in mind the scheduling of the project. The estimated time is feasible to complete the project.

1.3 Background of the Study

For hospitals, a blood bank known as blood collection center, also is an area in which collected blood bags are stored and preserved for future use in blood transfusion services. Blood transfusion is a medical operation where a patient requires blood or blood products as a life saving measure. In an article¹ published in Times of Oman in 2014, it was reported by Ministry of Health (MoH) that the total amount of blood donated annually in Muscat is approximately 25,084 units. MoH further reported that its Department of Blood Services is functioning at full capacity to meet the demands in the Sultanate.

Most blood banks are still running manual system in its processes. As such, there is a lack of efficiency because it is still paper-based in collecting information about donors, inventories of blood bags, and blood transfusion services. The lack of proper documentation may endanger patients' health due to the possibility of having contaminate blood bags. Contamination happened when there is an incomplete donors' medical history record and the blood bags' shelf life is not monitored properly. Hence, a web-based blood bank management system might be needed to address these issues and problems encountered to ensure blood transfusion safety.

1.4 Problem Statement

Despite advances in technology, nowadays, most blood bank systems are running in manual system. As such, there is a prevalent problem in the availability of needed blood types. For instance, when a person needs a certain type of blood and this type is not available in the hospital, family members send messages through social media to those who can donate to them and this process takes longer than the life of the patient to the most dangerous. In addition, it seems that there is lack of proper documentation about blood donors and its medical history. This may lead to blood bag contamination and may affect the blood transfusion safety. Generally, this study aims to determine how the use of online bank management system enhance blood transfusion safety. Subsequently, this study seeks to answer the following specific problems:

1. What is the level of perception among blood bank's stakeholders on manual-based system?
2. What is the level of perception among blood bank's stakeholders on online blood bank management system?
3. H0: Is there no significant difference in the level of perception among stakeholders between manual-based and online-based blood bank system?

H1: Is there a significant difference in the level of perception among stakeholders between manual-based and online-based blood bank system?

1.5 Objective:

This applied research aims to design, develop and implement online blood bank management system. This web-based application provides:

- To ensure hospital to have good supply or inventories of blood bags.
- To check the availability of blood bags anytime.
- To manage the information of its blood donor.
- Function to check if the person donate blood for the last 3 months.
- To allow good documentation about the donor and its blood donation activities.
- Support fast searching to find match blood bags for the right person.

1.6 Scope:

This research study covers the three (3) basic operations of blood banks, namely: donor registration, monitoring of blood bags or products' inventories, and monitoring of blood bags or products' issuance. Also, due to time-constraint, respondents will be from hospitals from North Batinah Region in the Oman, though the research study talks about blood banks in the Sultanate of Oman. In addition, the study considers three (3) possible users of the system, namely: hospital administrator, doctors, and blood receptionists.

1.7 Limitation:

This research study does not cover the actual blood collection activity, and actual blood transfusion operation. Blood donors and patients or recipients of blood donation are not system users, their registration or information will be encoded by the blood bank receptionists.

1.8 Assumptions and Hypothesis:

The researchers assume the following assumptions:

1. Internet connectivity is needed for the online blood management system. Internet speed may affect the perception of the systems users with regards to the system effectiveness and efficiency.
2. Blood transfusion should be performed by medical or professional doctors only. The over-all safety depends on the success of the medical operation.

The researchers identify the following hypotheses:

1. There is a significant difference in the level of blood transfusion safety between manual-based and online blood bank systems.
2. There is an increased level of blood transfusion safety in using online blood bank management systems while there is an increased risk when using manual-based one.

1.9 Significance of the problem

The findings of this study will benefit blood banks in managing blood donation donors, activities, and blood bags. This will allow the hospital to take decision if a particular type of blood is needed and currently unavailable in the hospital, however, available in another nearby hospitals. Furthermore, managing the blood bags in the blood bank will be much easier because each blood bag has an information about the donor, donation activity details, and the expiration date. Also, doctor can use this system to serve blood bags to their patient and monitor the details of the donor.

The main advantages of the system are:

- Blood bank staff can find and manage the donor details on the system easily.
- The expiration date of blood bags can be viewed in the system.
- Hospital can be alerted about issued blood bags and its availability.
- The system is systematized, and organized in managing blood donor records and blood donation activities.

1.10 Definition of terms

- Blood bags are designed for the collection, processing and storage of whole blood and blood components They help in providing aseptic conditions for the separation of blood components. It acts as a closed system reducing the chances of contamination.
- Blood bank is a place where blood bag that is collected from blood donation events is stored in one place. Which refers to a division of a hospital laboratory where the storage of blood product occurs and where proper testing is performed to reduce the risk of transfusion related events.
- Donor is someone who gives a part of their body or some of their blood to be used by doctors to help a person who is ill.
- Transfusion: transfusion is done as a lifesaving maneuver to replace blood cells or blood products lost through severe bleeding. Transfusion of one's own blood (autologous transfusion) is the safest method, but it requires advanced planning, and not all patients are eligible.

CHAPTER 2

REQUIREMENT SPECIFICATION

2.1 INTRODUCTION:

To be used efficiently, all computer software needs certain hardware components or the other software resources to be present on a computer. These pre-requisites are known as (computer) system requirements and are often used as a guideline as opposed to an absolute rule. Most software defines two sets of system requirements: minimum and recommended. With increasing demand for higher processing power and resources in newer versions of software, system requirements tend to increase over time. Industry analysts suggest that this trend plays a bigger part in driving upgrades to existing computer systems than technological advancements.

2.2 HARDWARE REQUIREMENTS:

The most common set of requirements defined by any operating system or software application is the physical computer resources, also known as hardware. A hardware requirements list is often accompanied by a hardware compatibility list (HCL), especially in case of operating systems. An HCL lists tested, compatibility and sometimes incompatible hardware devices for a particular operating system or application. The following sub-sections discuss the various aspects of hardware requirements.

HARDWARE REQUIREMENTS FOR PRESENT PROJECT:

PROCESSOR: Intel dual Core i3 OR i5

RAM: 1 GB

HARD DISK 80 GB

2.3 SOFTWARE REQUIREMENTS:

Software Requirements deal with defining software resource requirements and pre-requisites that need to be installed on a computer to provide optimal functioning of an application. These requirements or pre-requisites are generally not included in the software installation package and need to be installed separately before the software is installed.

SOFTWARE REQUIREMENTS FOR PRESENT PROJECT:

OPERATING SYSTEM: Windows 7/ XP/8 or 10/11

FRONT END: Html, AJAX, JQuery, java script.

SERVER SIDE SCRIPT: Php

DATABASE: Mysql

CHAPTER 3

METHODS AND PROCEDURES

3.1 Introduction

This section presents the research methodology used in the study, the research design, and the data collection process. This section also presents the theoretical or conceptual framework of the study, the sampling plan, and tools to be used for data analysis.

3.2 Theoretical/ Conceptual Framework

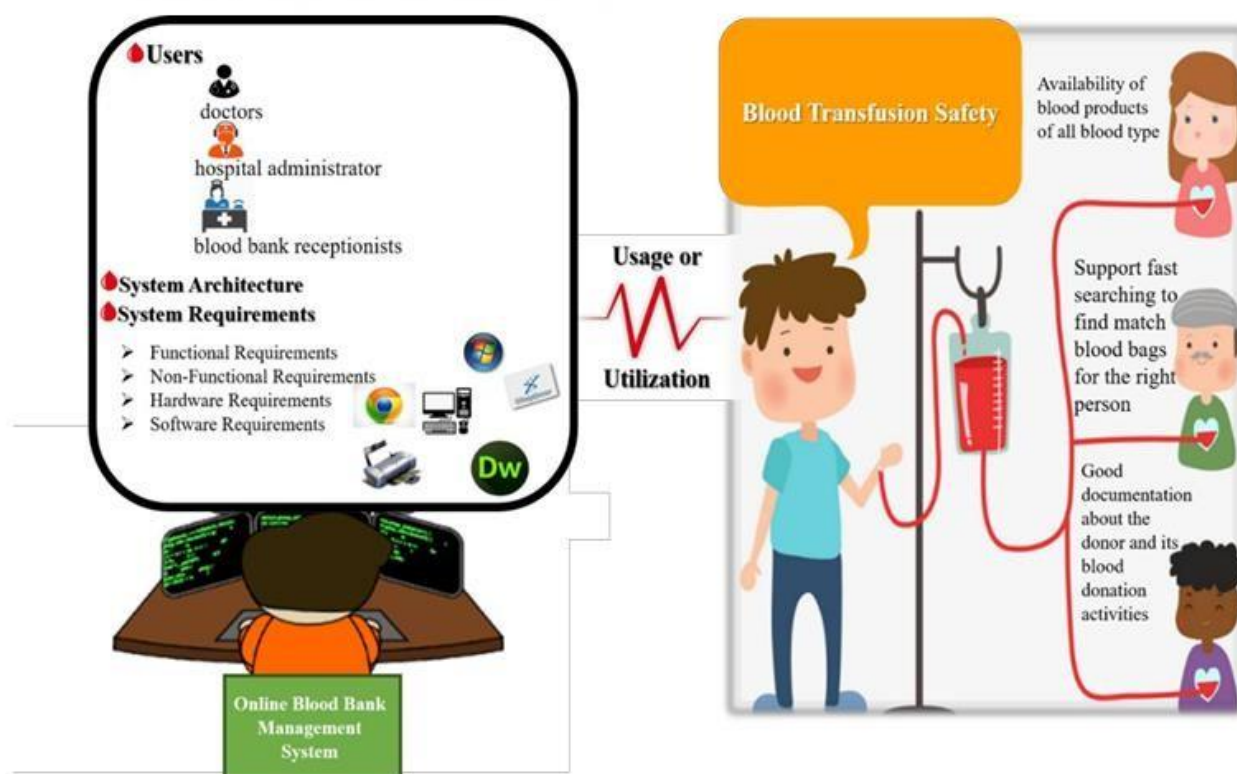


Figure 1.0: Conceptual Framework

The conceptual framework served a mental window of the researchers because it depicted the research design and the relationships of the variables involved. Based on the figure above, the usage or utilization of the online blood bank management system can lead to the enhancement or improvement of blood transfusion safety.

3.3 Methods and Procedures

The researchers used both descriptive research and experimental research design methods. The study was descriptive because it describes the nature of situation as it exists at the time of the study. Also, it was a systematic and scientific approach to research in which the researchers manipulate one or more variables, and control and measure any change in other variables. It involves collection of data in order to test hypotheses or to answer questions concerning current status of the subject of the study. The study was also experimental because it has an assumption of a cause-and-effect relationship, and the researchers introduce online blood bank management system as intervention that caused the change.

In this study, the researchers used questionnaire to collect information and to obtain the perception of the various stakeholders on how they perceive the manual-based system and the online system. The questionnaire was administered to hospital administrators, doctors, and blood bank receptionists. In sampling, the researchers used cluster sampling in which respondents were grouped according to their roles and responsibilities. The questionnaire includes 18 questions. There were many strategies to analyze data after collected. The researchers counted the frequency of each question, and computed the mean as a measure of central tendency. Also, standard deviation and variance were calculated to perform the t-test. From the mean or average of both manual based system and online system, the researchers compared the computed mean to see if the use of online system is much better than manual system. Also, from the result of t-test, the researchers decided if the null hypothesis will be accepted or not.

Tables and graph were drawn to show these computations and figures.

	User action	Create	Read	update	delete
1	Sign Up	Reg_users	-	-	-
2	Log in	-	Reg_users	-	-
3	Add Blood Bank	Blood_banks	-	-	-
4	Delete Blood Bank	-	-	-	Blood_bank
5	Update Blood Bank	-	-	Blood_bank	
6	Record Donations	Blood_donation	-	-	-
7	Request Blood	Blood_request	-	--	-
8	Approve Blood Request	-	-	Blood_request	

CHAPTER 4

SYSTEM DESIGN

UML DESIGN:

The Unified Modeling Language (UML) is a standard language for specifying, visualizing, constructing, and documenting the software system and its components. It is a graphical language, which provides a vocabulary and set of semantics and rules. The UML focuses on the conceptual and physical representation of the system. It captures the decisions and understandings about systems that must be constructed. It is used to understand, design, configure, maintain, and control information about the systems.

The UML is a language for:

- Visualizing
- Specifying
- Constructing
- Documenting

USE CASE DIAGRAM:

A use case diagram in the Unified Modeling Language (UML) is a type of behavioral diagram defined by and created from a use-case analysis. Its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases.

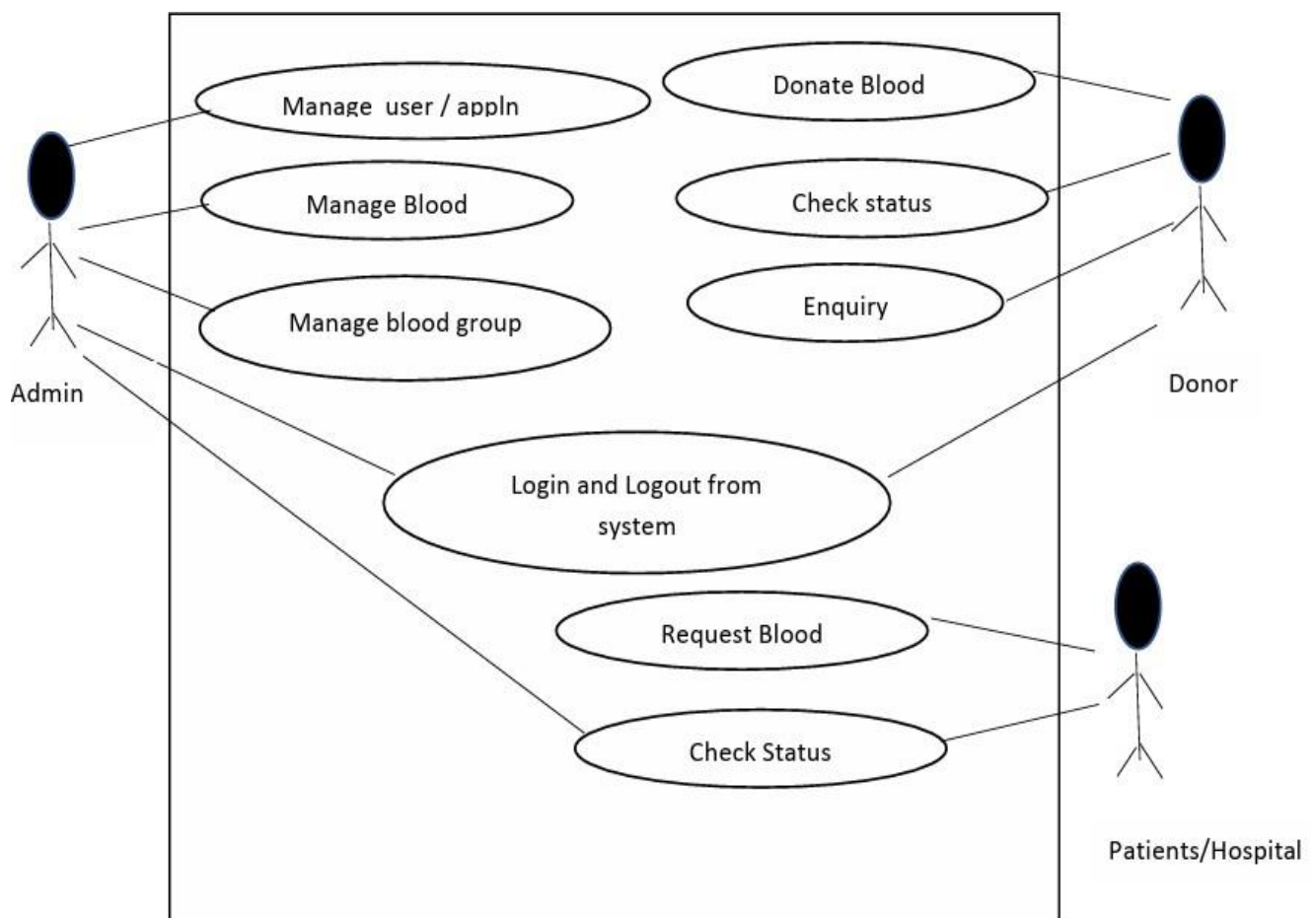


Fig 1.1: Use Case Diagram

E-R Diagram:

Database is absolutely an integral part of software system. To fully utilize ER Diagram in database engineering guarantee you to produce high quality database design to use in database creation, management and maintenance. An ER model also provides a means for communication.

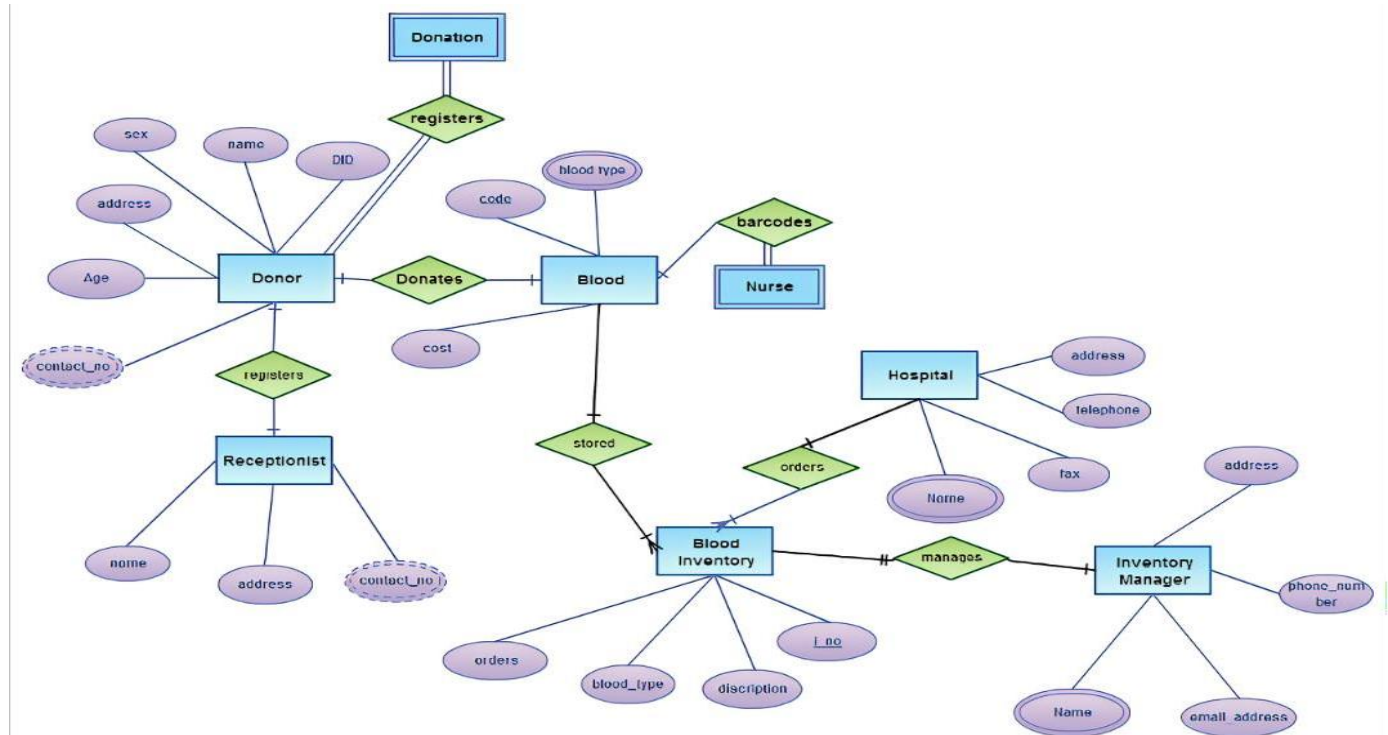


Fig 1.3: ER Diagram

RELATIONAL SCHEMA:

A Class is a category or group of things that has similar attributes and common behavior. A Rectangle is the icon that represents the class it is divided into three areas. The upper most area contains the name, the middle; area contains the attributes and the lowest areas show the operations. Class diagrams provides the representation that developers work from. Class diagrams help on the analysis side, too.

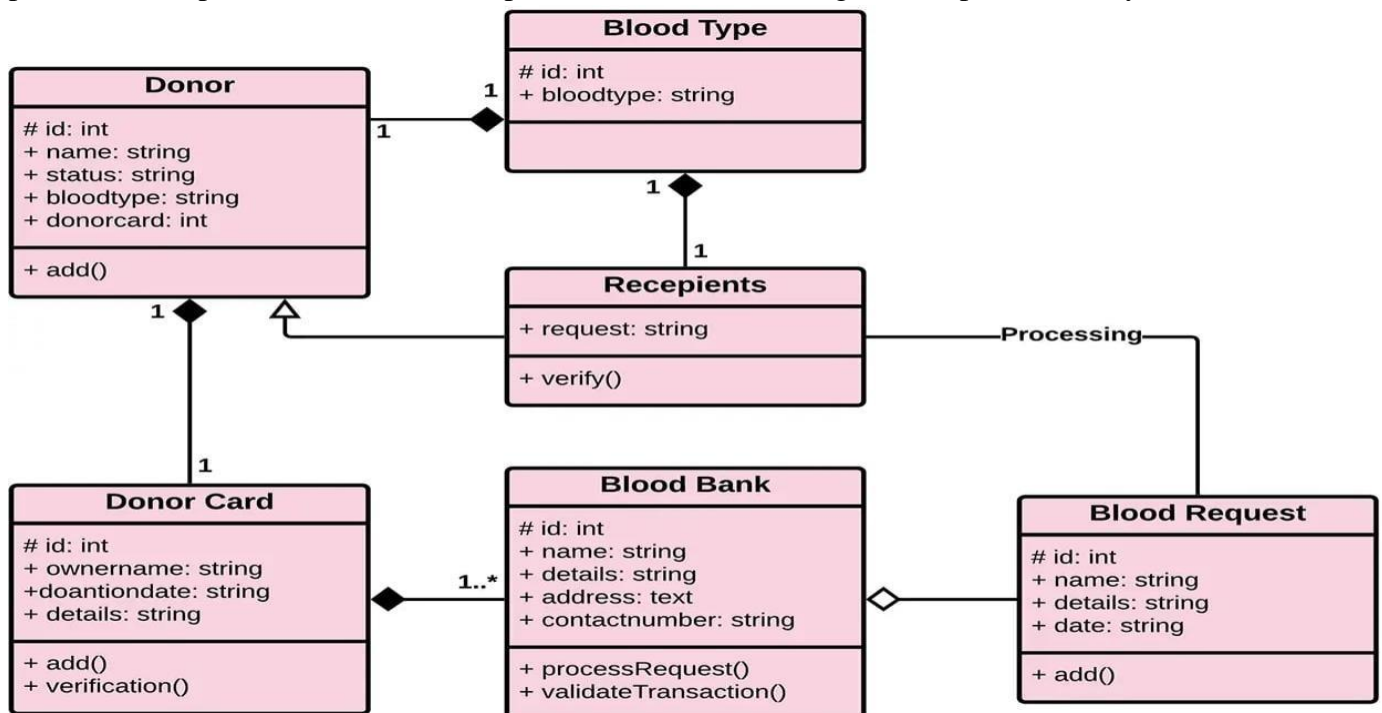


Fig 1.4: Relational Schema

CHAPTER 5

TESTING

Testing is an important phase in software development. After completion, the system may work without any problem. But, there should be several unknown or hidden errors in the system still remaining. The error chances may be injected into the system at any stage of the development. Even if there are techniques to detect and eliminate the errors, some errors may remain in the system. So after the completion of coding, the system is to be executed with the only purpose of detecting maximum number of errors. The tester executes the system, and inputs different types of values that may cause error or some exceptional situation in the system. The error locations detected through the testing are to be corrected in the system then. So, the important and the only aim of testing is to detect and cure as many as possible of an error that may face in the future executions of the system. Testing is a set of activities that can be planned in advance and conducted systematically. Testing begins at the module level and works towards the integration of the entire computer-based system. Nothing is completed without testing, as it is vital to the success of the system. System testing makes a logical assumption that if all parts of the system are corrected, the goal will be successfully achieved. Inadequate testing or non-testing may lead to errors that may not appear until months later.

PURPOSE OF TESTING

Testing is the success of the system. System Testing makes a logical assumption that if all parts of the system are correct, the goal will be successfully achieved. The following points show how testing is essential.

Existence of program defects or inadequacies is inferred.

- ❖ Verifies whether the software behaves as intended by its designer.
- ❖ Checks conformance with requirements specification or user need.
- ❖ Assesses the operational reliability of the system.
- ❖ Tests the performance of the system.
- ❖ Finds the fault which caused the output anomaly.
- ❖ Detects flaws and deficiencies in requirements.
- ❖ Exercises the program using data like the real data processed by the program.
- ❖ Tests the system capabilities.
- ❖ Judges whether or not the program is usable in practice.

TESTING OBJECTIVES

There are several rules that can serve as testing objectives. They are:

- ❖ Testing is a process of executing a program with the intent of finding errors.
- ❖ A good test case is one that has a high probability of finding an undiscovered error.
- ❖ A successful test is one that uncovers an undiscovered error.

If testing is conducted successfully according to the objectives as stated above, it would uncover errors in the software. Also, testing demonstrates that software functions appear to be working according to the specifications, that performance requirements appear to have been met.

- ❖ For correctness
- ❖ For implementation Efficiency
- ❖ For Computational Complexity

Tests for correctness are supported to verify that a program does exactly what it was designed to do. This is much difficult that it may at first appear especially for large programs.

Tests for implementation efficiency attempt to find ways to make a correct program faster or use less storage. It is a code-refining process, which reexamines the implementation phase algorithm development. Tests for computational complexity amount to an experiment analysis of the complexity of an algorithm or an experiment comparison of two or more algorithms, which solve the same problem.

TYPES OF TESTING

System testing is the stage of implementation, which is aimed at ensuring that the system works accurately and efficiently before live operation commences. Testing is vital to the success of the system. System testing makes a logical assumption that if all the parts of the system are correct. The goal will be successfully achieved. The candidate system is subject to a variety of tests. A series of tests are performed for the proposed system is ready for system acceptance testing.

The various levels at which testing are conducted are

- Unit testing
- Integration testing
- Sequential testing
- System testing
- Validation testing

UNIT TESTING

In unit testing each program unit is tested individually, so any errors in a unit are debugged. Sample data is given for unit testing. The unit test results are recorded for future references. Unit testing focuses verification efforts on the smallest unit of software design, the module. This is known as "module testing". It comprises of the set test performed by an individual programmer prior to the integration of unit into the large system. The modules are tested separately, this testing is carried out programming stage itself. In this step each module is found to be working satisfactory as regard to the expected output from module. The unit testing was done for every module in the software for various inputs, such that each line of code is at least once executed. This testing was carried out during the unit to a large system.

INTEGRATION TESTING

Integration testing is a systematic technique for constructing the program structure while at the same time conducting test to uncover errors associated with interfacing. The objective is to take units tested components and build a program structure that has been dedicated by design. Incremental integration is a type of integration testing where in the program is constructed and tested in small increments, where the error are easier to isolate and correct.

USER ACCEPTANCE TESTING

Acceptance testing is running the system with live data by the actual user. An acceptance test has the objective of selling the user in the validity and reliability of the system. A comprehensive test report is prepared. The report indicates the system's tolerance, performance range error rate and accuracy. It verifies the system procedures operate to system specification and the integrity of important data is maintained, performance of an acceptance test is actually the users show. User motivation is very important for the successful performance of the system. After that a comprehensive test report is prepared. This report shows the systems tolerance, performance range, error rate and accuracy.

VALIDATION TESTING

Here the inputs are given by the user are validated. That is password validation, format of data are correct, textbox validation. Changes are needed to be done after result of this testing. Verification testing runs the system in a simulated data. Validation refers to the process of using software in order to find errors. The feedback from the validation phase generally produces changes in software to deal with errors and failures that are uncovered. Validation may continue for several months.

CHAPTER 6

SYSTEM IMPLEMENTATION

A Crucial phase in the system life cycle is the successful implementation of the new system design. Implementation involves creating computer compatible files, training the operating staff, installing hardware, terminals. In the system implementation, user training is crucial for minimizing resistance to change and giving the new System a chance to prove its worth. The objectives of the system implementation is to put the system into operation while holding costs, risks and personal irritation to minimum. Once the physical system has been designed in details, the next stage is to run the design into a working system and then to monitor the operation of the system to ensure that is continue to work efficiently and the operation of the system to ensure that is continues to work efficiently and effectively. The implementation stage of a is often very complex and time consuming because many more people are involved than in the earlier stages.

The system implementation took place through various stages as follows,

- Implantation planning.
- Education and training.
- System testing.
- System implementation.
- Change over.

The implementation plan includes a description of all the activities that must occurs to implement the new system and to put it into operation. To achieve the objectives and benefits from computer based system, it is essential for the people who will be confident of their role in the new jobs. After software is developed to meet usre's requirements, users test it for acceptance. The changes over phase is used to provide adaptability for the new system.

SYSTEM MAINTENANCE

Software maintenance is the process of modifying a software system or component after its delivery in order to correct faults, improve the performance and other attributes, or to adapt to the changed environment. Maintenance covers a wide range of activities including correcting the error and design coding, updating the documentation and test data, and upgrading the user support. There is an aging process that calls for periodic maintenance of hardware and software. Maintenance is always necessary to keep the software usable and useful. Hardware also requires periodic maintenance to keep the system in to its standards. After installation is completed and the user starts is adjust to the changes created by the candidate system. Evaluation and maintenance begin. If new information is consistent with design specification the changes have to be made. Hardware also requires periodic maintenance to keep in tune with design specification. User priorities changes in organizational requirements or environmental factors also called for system enhancements. Maintenance covers a wide range of activities, including correcting, coding and design errors, updating documentation and test data, and upgrading user support. Any activities classified as maintenance are actually enhancements.

CHAPTER 7

SAMPLE SNAPSHOTS

7.1 HOMEPAGE OF BLOOD BANK MANAGEMENT SYSTEM

DESCRIPTION: This is the homepage of blood bank management system that can be accessed by anyone who wishes to see about this website.



CONTACT US PAGE

DESCRIPTION: If you have any question about blood or blood bank, you can send direct message after entering the correct information like name, email, phone number, and finally send the message by clicking the send button. After that it will go to the admin panel where admin can see the message or questions.

CHAPTER 8

FUTURE ENHANCEMENT

Almost every project is subjected to change on depending on the client requirements. Since this system is subjected to change for each and every client, there is always a scope for further enhancement. The system and the architecture of the assessment system is a compatible one, so addition of new modules can be done without much difficulty. The software is developed in php which makes the system more reliable and compatible with other environments. The application proves better extensibility and flexibility for future enhancements. Any further requirement application is possible with the same feature guaranteed. It is a user-friendly system, which is very easy and convenient to use. The system is complete in the sense that it is operational and it is tested by entering data and getting reports in proper order. During the development of this project coding standards are followed for easy maintainability and extensibility. Though the new system provides a base for improving the efficiency of operations, there are lots of further enhancement that can be added to this project. Keeping this in view, provision has been made in the system to facilitate easy modification updating in future. Any modification will not affect the normal working of the system. The developed system is very interactive, coded in such a way to ensure maximum user friendliness and also allows flexibility for future. The system developed automates most needed activities in an organization. The new system can be combined with an existing system as well. More and better advanced separation system can be build on top of the proposed system as and when the need arises. This is one of the main special feature of the proposed system.

CONCLUSION:

The conclusion for a report on a Blood Bank and Donor Management System would emphasize the significance of the system in addressing critical issues related to blood donation and management. It would highlight the key findings and outcomes of the study. Here is a concise conclusion based on the provided sources:

The Blood Bank and Donor Management System plays a crucial role in streamlining blood donation processes, ensuring efficient management of blood supplies, and bridging the gap between donors and recipients. By automating the entire process from donor registration to blood screening, testing, storage, and distribution, this system significantly enhances the accessibility and availability of safe blood for patients in need. The proposed system not only simplifies blood donation but also addresses the challenges associated with manual record-keeping, ensuring timely access to donor information and efficient blood stock management. Overall, the Blood Bank and Donor Management System stands as a vital tool in modern healthcare, offering a centralized platform to facilitate blood donation, transfusion, and management effectively.

This conclusion encapsulates the importance and benefits of implementing a Blood Bank and Donor Management System for enhancing blood donation processes and ensuring efficient management of blood supplies.

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