International Journal on Science and Technology (IJSAT)
E-ISSN: 2229-7677 ● Website: www.ijsat.org ● Email: editor@ijsat.org

The Medicrest System

Khushi Priya[1], Priyank Saraswat[2], Sheo Kumar[3]

[1,2]Student, Department of Computer Science and Engineering, Galgotias University, INDIA
[3]Instructor, Department of Computer Science and Engineering, Galgotias University, INDIA

Abstract

Better patient care, better administration, and increased profitability are all part of the medicrest system. The project's goal is to create a digital management system that will raise the hospital's efficiency and standards for system integration. It was successful in creating a module that would offer certain services, such as scheduling doctor appointments, scheduling lab test times, obtaining pharmacy services, and obtaining health programs. This system has an admin handling section that allows the admin to handle users, pharmacy systems, health program administration, and the scheduling of lab tests and doctor's visits. Additionally, the administrator can create different reports using this method based on his needs [7]. A module that would oversee the hospital's medication inventory and handle admissions bills and prescription payments. The problem statement is that manual record management is time- consuming and prone to error since hospitals are involved with the daily lives and routines of regular people. The goal of this project is to automate, or put online, the daily tasks. The researchers were able to plan the workflow for each activity and build the study with the guidance of each step. The method has the potential to improve hospital staff productivity and work progress, the researchers concluded. In order to give customers a summary of the hospital transactions within a certain date, it may also produce hospital reports. Additionally, it offered the ability to look up the patient's information in the receptionist module. The hospital's workload might be lessened by the system, which would improve administration and productivity. Overall, hospital transactions improved as a result of the study. It has been suggested that the system's frontend design needs to be improved.

Keywords: Computer Numerical Control(CNC), Internet of Things (IoT), Quick Response(QR)

1. Introduction

Computerized patient registration, information sorting, and patient registration are all included in the medicrest system. Every employee and patient can automatically access a search function through the software. You can view the status of each availability using its search function [03]. The user can search for patient information and the availability of a doctor. The medicrest system can be accessed with a username and password [01]. It is accessible by an administrator or a receptionist. Only they have the ability to add data to the database. It is easy to retrieve the information. The user interface is rather straightforward [05, 06]. Data processing is efficient and ideal for individual use. A variety of hospital administration procedures for multispecialty institutions were addressed by the creation of the Health Board System. Hospital analysis and activity-based pricing can be better administered with the help of the medicrest systems [03,05]. You can expand your company and improve work quality and production with the help of the medicrest system [02]. Simplifying all management procedures, such as patient registration, doctor appointments, and prescription writing, is the aim of the medicrest system project.

A few registers must be traversed by the user. This results in a loss of time. Therefore, it would be easy to manage every operation if you use this method. Thus, utilizing the motivation of this scenario, which was commonly carried out in hospitals, the development team is creating a system that may assist both patients and hospital staff [01,05]. Thus, the system that enables hospitals to operate swiftly and effectively is what the stakeholders want.

2. Litrature review

The databases that were searched using different keywords first produced a collection of results. The data were only analyzed for research that employed maturity models. Studies that failed to employ maturity models were excluded. Operational effectiveness and wait times across various procedures, departments, and personnel are two of the biggest problems facing the medicrest systems today [4]. The solution gives customers the ability to analyses existing procedures and make the required adjustments to improve service levels and process efficiency. It also includes visual simulation. This approach resulted in a final sample of 41 surveys. A total of 82.93% of them are distributed among various components, with expert dissertations accounting for 9.76% and doctoral dissertations for 7.32%.[3, 7]

A. Existing Systems

Daily organization of the storage at the moment, the file system contains all of these details. As a result of this daily occurrence, a number of files will accumulate. At the hospitals, every task is overseen and finished by hand. It may therefore take a considerable amount of time and effort to complete each task. It is very labour-intensive. Currently, only Zone Hospital oversees daily operations using manual procedures. The receptionist will assist patients in scheduling lab tests and doctor's appointments. Patient delivery is not an option; patients can only purchase pharmacy products at hospitals. The hospital is the only healthcare option available to patients. Every lab test result, patient information, and doctor's information is meticulously documented on paper before being input into a computer. Professionals will also help with the manual creation of the reports.

B. Existing System Problem

The current system takes a long time. Lack of security elements each activity must be finished by hand. Most tasks and activities rely on human resources and professionals. No communication with higher officers directly. The degree of precision is arbitrary. Manual system management requires a significant financial investment. Obtaining backup data and transferring data can be challenging. IoT technologies and robotic intelligence are difficult to integrate. With today's technology environment, manual systems are not very dependable and lack user friendliness.

3. Methodology

The medicrest system will be developed in two stages: first, a database will be built; second, the interface will be customized; and third, the interface will be developed and specific codes will be generated. Learn from and adjust current systems to enhance results. After a thorough investigation, the development team was able to determine the current system's benefits and drawbacks and come up with solutions for the latter. The five primary modules of the solution system were made available. These include appointments, pharmacies, healthcare programs, and physician management [3]. To find a new system as a solution, the existing system is examined and contrasted. The best software solution will be

selected following an evaluation of the available options [6]. Creating a collection of tables and establishing their relationships is the first step in building a local database [4].

Java technologies, which are widely utilized by many large organizations, were used in the construction of the system. The development team used Java Swing and the Abstract Window Toolkit (AWT) to make the final product's interface both aesthetically pleasing and easy to use. Java was used to implement the backend's primary features, with a focus on security, authorization, validation, authentication, and performance. To guarantee safe and effective data handling, the backend developers made use of a variety of Java modules and frameworks. The team decided to use MySQL, a relational database, for data management in order to process and store all of the inserted data. The system's scale-out design makes it possible to store and manage structured data with ease, even when dealing with massive data quantities. By facilitating easy field and data structure upgrades and enabling flexible schema management, MySQL makes sure the system is scalable and responsive to changing requirements.

All of the inserted data is managed and stored in a non-relational database. MySQL has been chosen by the administration group. To process massive amounts of data quickly, use a scale-out design. Permit basic field and schema updates, as well as the storing of structured, semi-structured, and unstructured data. The database was effectively created to manage information about patients, doctors, lab tests, medical programs, and medications. The system user uses this information as needed. This system is easy to use and makes it possible to quickly schedule necessary appointments.

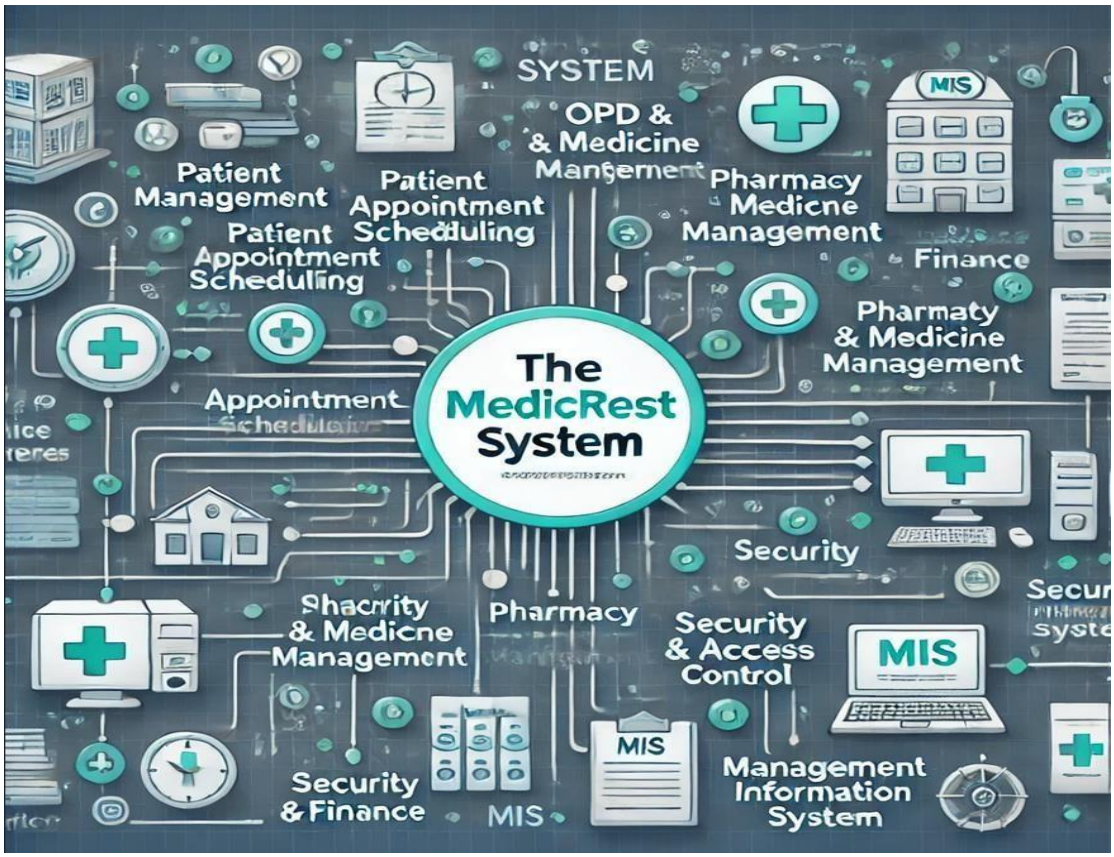

Figure 1: System Overview

a. Proposed system

A. Background of The medicrest system

All of a hospital's data and operations are compiled onto a single platform by the medicrest system. The hospital information system includes every aspect of the hospital's information processing and storage operations. Stated differently, it encompasses more than just the computer systems, networks, and computer-based application systems that are integrated into them. Rather, it refers to all of the hospital's data.

B. Project Objectives

This project's goal is to create a web-based application for the medicrest system that uses a MySQL database for the back end and React for the front end. Using this software will make scheduling doctors, lab test times, pharmacy services, and health programs more efficient. This system has an admin handling section that allows the admin to manage users, pharmacy systems, health program administration, and patient lab test and doctor appointment scheduling. It also explains the user interface and different models that could be used to create software of this kind.

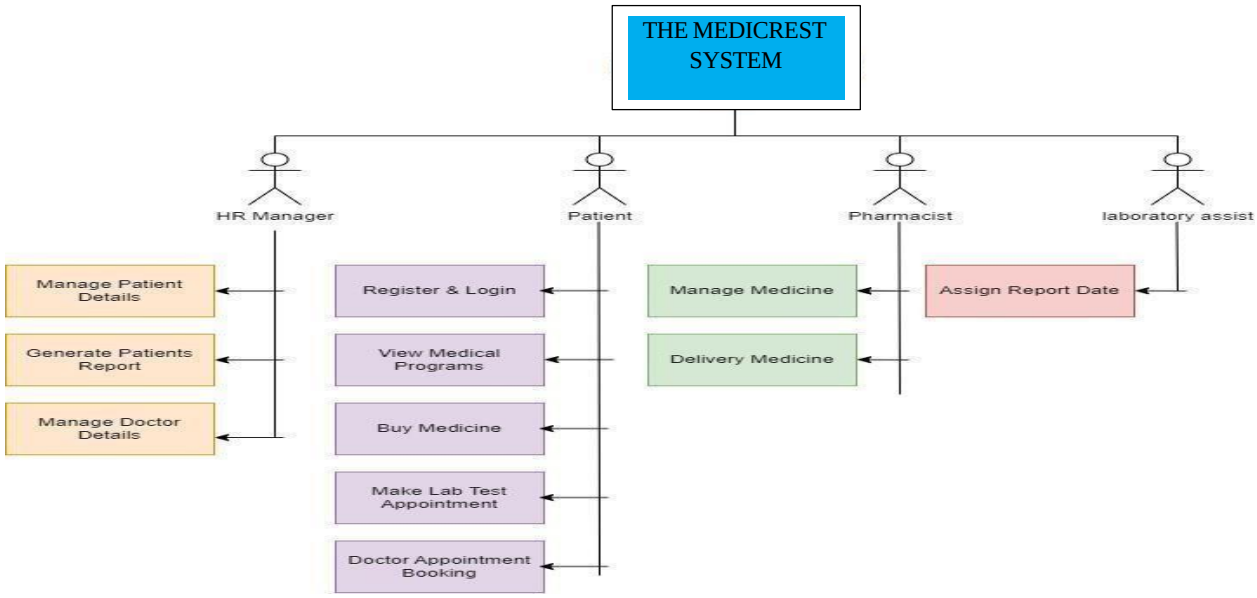

Figure 2: TMS High Level Diagram

Because they provide the best medical care to people suffering from a wide range of illnesses—which can be caused by changing weather patterns, an increase in workload, stress, emotional trauma, etc.—hospitals play an essential role in our lives. Maintaining daily records of its patients, doctors, nurses, ward boys, and other staff members who contribute to the hospital's smooth operation is crucial. However, recording all of the actions and associated documentation on paper is incredibly time-consuming and prone to mistakes. Additionally, it is extremely inefficient and a drawn-out process that considers the continuous increase in hospital visits and the population. When kept and recorded, all of these records are incredibly inaccurate, ineffectual, and prone to mistakes.

C. Overall System

The medicrest system is a computer program that facilitates the management of health care-related data and helps medical professionals perform their jobs more efficiently. They oversee the data for each health care division, including patient record, etc.

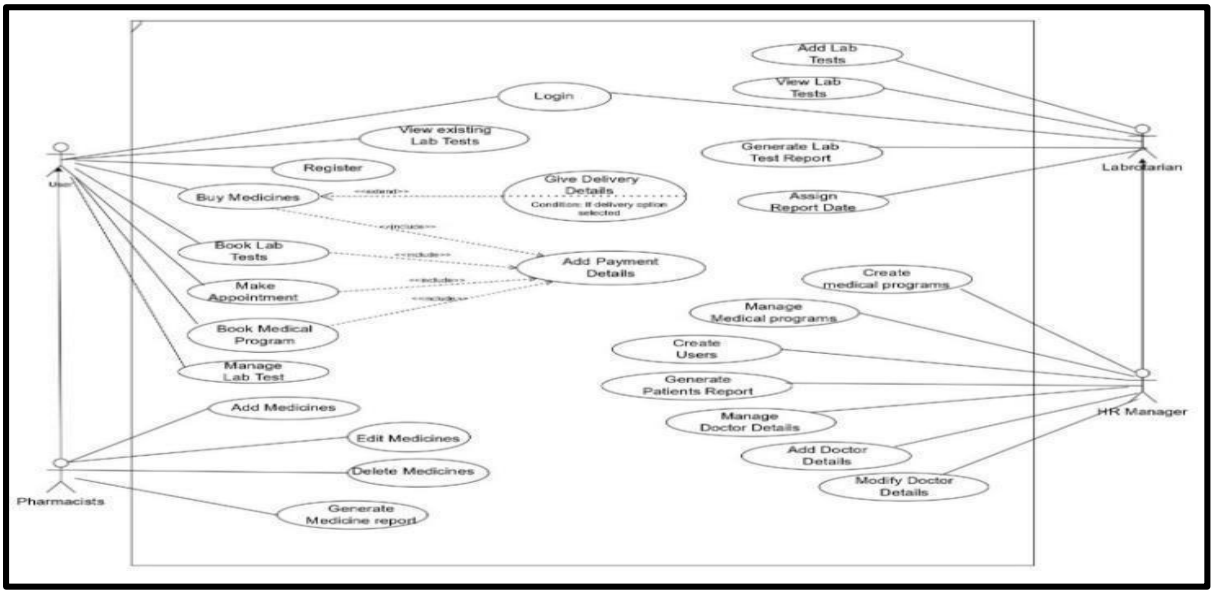

Figure 3: TMS Use case Diagram

User Management

The User Management module of the Medicrest System is essential to preserving the security and integrity of the hospital's data. One important step in making sure that only authorized individuals may access sensitive information is the implementation of the receptionist login page. The system checks a receptionist's credentials against the database when they try to log in. The system instantly shows a "Invalid User" notice if a password is typed incorrectly, prohibiting unwanted access.

This feature, which gives the user instant feedback while protecting data privacy, was created with security in mind. Additional security measures, such password complexity restrictions, account lockout following a predetermined number of unsuccessful attempts, or even two-factor authentication (2FA) for enhanced protection, may be added in later updates. Additionally, by enabling the receptionist to recover their credentials in the event that they are forgotten, a password recovery feature could improve the user experience. Other user roles, including physicians, nurses, and administrative staff, can be added to this login system, guaranteeing strong, role- based access control across the medicrest system.

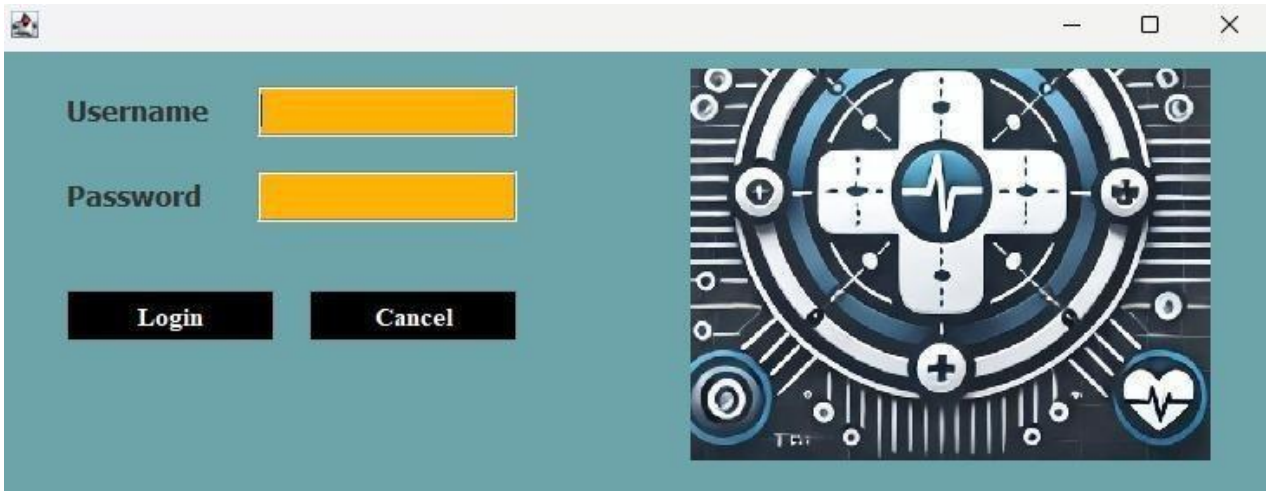

Figure 4: User Login Interface

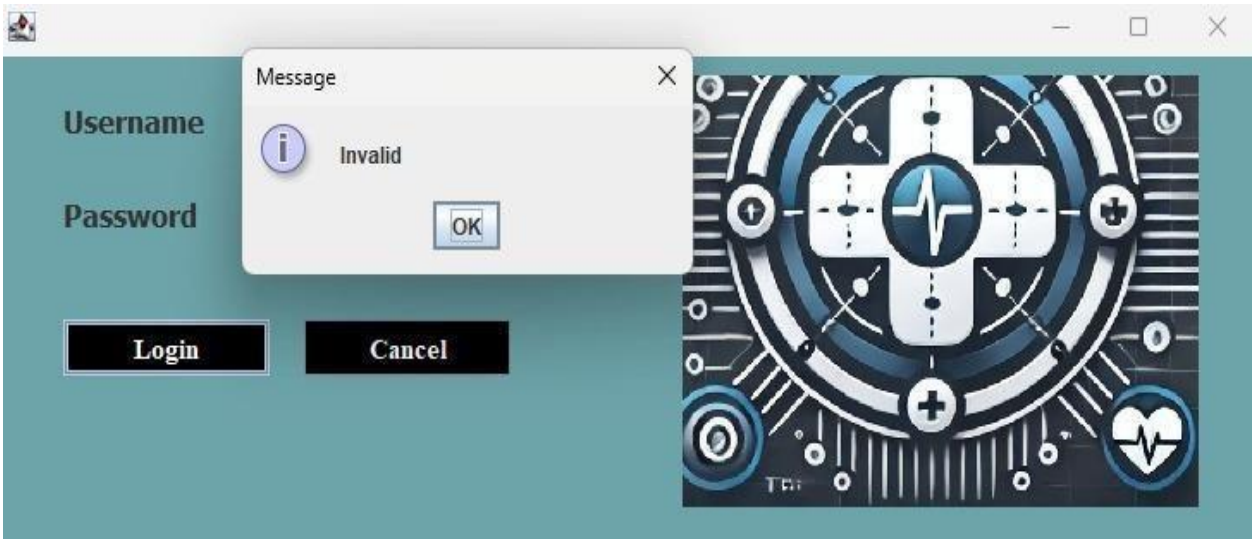

Figure 5: User Login Interface

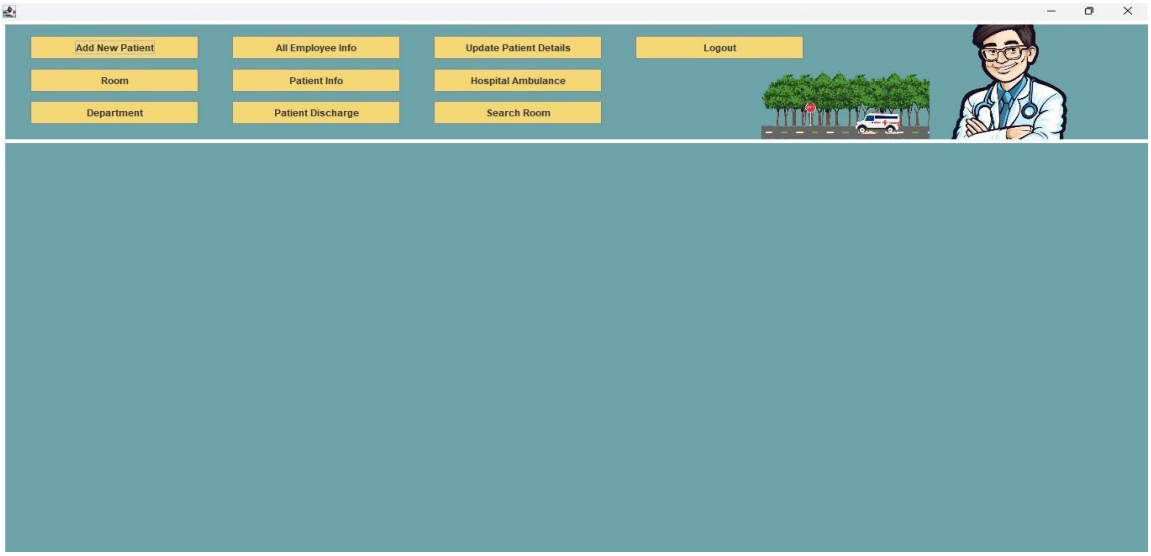

Figure 6: Reception User Interface

Figure 7: New Patient For

4. Non – functional benefits

Making sure users are happy and have the best possible experience is the most important part of developing a system. That is far more difficult when it comes to health care management. Today's users don't think twice about switching to other platforms in order to access services. Ensuring high-quality services benefits both patients and medical staff. The five main quantitative studies that are more important in providing the user with better services are the main focus of the developed health care system. First and foremost, the system should be physical tangible in the sense that the newly added physical components to the organization should make it easier to support the system due to the fact that the healthcare industry will keep evolving. As a result, the system should be more reliable in the future. The expected system should be able to perform the assigned task more precisely and flawlessly. The system must be more responsive in order to provide users with continuous service. Assurance also includes being courteous, credible, knowledgeable, and considerate of the needs of the customer. The system must be more empathetic in order for customers to understand it. Users should also keep the lines of communication open.

Physical elements have recently been added to the organization due to the fact that the healthcare industry will keep evolving. As a result, the system should be more reliable in the future. The expected system should be able to perform the assigned task more precisely and flawlessly. The system must be more responsive in order to provide users with continuous service. Assurance also includes being courteous, credible, knowledgeable, and considerate of the needs of the customer. The system must be more empathetic in order for customers to understand it. Users should also keep the lines of communication open.

The system's user-friendly design makes it easy for healthcare workers with varying technical skill levels to operate, reducing the learning curve and boosting productivity. Furthermore, through interfaces with other healthcare systems like electronic health records (EHR) and diagnostic tools, it is interoperable, making coordination and data exchange simple. Built-in data validation ensures accuracy and integrity by preventing errors during data entry and reducing the likelihood of inconsistencies. Due

to its adaptability, the system can be customized to meet the unique needs of different healthcare facilities, such as following local regulations and specific organizational protocols.

5. Future enhancement

In the future, this system might still be able to advance. Because it supports IOT devices, the system appears to like that the company can store a lot of data. For example, patients can save a great deal of time by using a QR code for each reservation digitally monitoring medical consultants. Appropriate space management using sensors can further support the growth of this industry. The system's feedback feature allows users to provide recommendations for enhancements. That makes the system even better. The system currently only has five fundamental modules, but it can be made even better by including additional modules like supply management, facility management, billing management, and operating theatre management.

6. Limitation

Due to the rapid advancement of technology and the growing size of the hospital, this approach still has many limitations. Among them are security-related problems. Malicious and unauthorized user attacks are possible because of the competitive environment. On the other hand, prompt security-related updates help to fix that issue. Additionally, a massive database is needed. The system's capacity to gather and handle data must advance in tandem with the growth in the number of users. To store those data, a sophisticated database system is required. More productive front-end staff will work on that system. They could get past that with the correct guidance.

There is a need for user-centric design improvements because, even though the system is functional, its user interface may not suit a range of user groups, such as those with low technical knowledge or accessibility requirements. Furthermore, the system lacks integration for telemedicine and remote patient monitoring, two features that are becoming increasingly crucial in modern healthcare settings. Scalability may also become a problem as the system expands to accommodate larger datasets or multi-branch healthcare facilities, requiring further database performance and system design enhancement. Even with robust security measures, they might need to be enhanced with real-time threat detection and advanced encryption methods to address the constantly evolving cybersecurity issues. These shortcomings point to potential areas for research and development to enhance the Medicrest System's functionality, scalability, and broad applicability.

7. Conclusion

The main focus of this project is the creation of a system for the renowned hospital Zone. Thanks to this system, the majority of the hospital's everyday operations are now computerized. The main users of the system are lab assistants, patients, pharmacists, and HR managers. Five modules make up the system used to organize the work at this hospital. These are the doctor management systems. Systems for managing reservations, pharmacies, human resources, and healthcare are also available. The majority of the work is computerized with these modules.

Similar to managing health information, arranging lab test scheduling, keeping an eye on patient data, and overseeing the delivery procedure and pharmacy data. Furthermore, the system is made to generate precise results for a range of applications, such as lab test reporting, patient scheduling, pharmacy data, etc. Using the search function in this system makes sorting information easier. The system provides solutions for all basic hospital tasks. The main function of this system is to help maintain hospital facts by offering an efficient way to store data. The most important aspect of the system is its capacity to assist the business with data backup.

References

1. Phil Hanna. (2003). *JSP 2.0: The complete reference*. Tata McGraw Hill Edition.
2. J. Clerk Maxwell. (1892). *A treatise on electricity and magnetism*. (3rd ed.). Oxford: Clarendon, pp.68–73.
3. Ali Bahrami. (1988). *Object-oriented system development*. (3rd ed.). Tata McGraw Hill Edition.
4. Ivan Bayross. (2009). *SQL, PL/SQL programming language of Oracle*. (2nd ed.). BPB Publication.
5. Tarhan, A., Turetken, O., & van den Biggelaar, F. J. (2015). *Assessing healthcare process maturity: challenges of using a business process maturity model*.
6. Areda, C.A., Galato, D. & Federal, D. (2015). Mapping of processes in a hospital pharmacy: tool forquality management and improvement, Brazilian *Journal of Hospital Pharmacy and Health Services, 6*(3), 27-33.
7. Schriek, M., Türetken, O. & Kaymak, U. (2016). A maturity model for care pathways. *Twenty-Fourth European Conference on Information Systems, Research Paper 127 (PDF)*.
8. David Lake, Rodolfo Milito, Monique Morrow & Rajesh Vargheese. (2014). Internet of things: Architectural framework for ehealth security. *Journal of ICT, River Publications*, pp. 101-328.