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Build Hospital Management System using PHP framework

Mahabat Fayaq Mohammad Ali
Network Department, College of Computer & IT, Garmian University - Khanaqeen, Iraq

Article Info	ABSTRACT

Service institutions are considered one of the most important institutions in our time, and they have become a great place in our lives The health institutions are considered the most important, because they provide many types of necessary health services And related to the safety of the health of individuals, and through cooperation between the academic study and the health sector, which was represented by Khanaqeen General Hospital, where this research paper presented a proposal hospital management system project is primarily focused on managing medical-related records within a hospital. More precisely, this system helps track medical reports. The system also displays all available employees and patients. In additionally, the system can aggregate inventory and pharmacy records, this system consists of two major sections: database structure, and GUI (Graphical User Interface) frames (created in environments utilizing PHP, HTML, and CSS). The database constructed with MYSQL and the GUI frame make it easier for novice users to utilize the suggested system. at the latest this paper describes a hospital management system that can be used to manage and analyze hospital information related to patients, treatments, and sales. The practical implications of this system are:

It can help hospitals to manage their operations more efficiently by providing a centralized system for managing patient information, treatment records, The system can be of assistance hospital administrators to make data-driven decisions by providing them with real-time information about hospital operations, and improve patient care by providing doctors and nurses with easy access to patient information and treatment records, The system can be beneficial to reduce errors and improve accuracy by automating many of the manual processes involved in managing hospital information.

Overall, the HMS described in this paper has the ability to increase efficiency, accuracy, and quality of hospital operations, which can ultimately lead to better patient outcomes.

Corresponding Author:

Mahabat Fayaq Mohammad Ali
Network Department, College of Computer & IT, Garmian University - Khanaqeen, Iraq
Email: Mahabat.fayaq@gramian.edu.krd

1. INTRODUCTION

Hospitals are the most extensive and complicated health-care institutions, Hospital administrators' ability to make sound decisions is critical to providing safe and effective patient care. The major responsibility of a hospital executive is to guarantee that the hospital offers exceptional services and care for its patients. everyday hospital performance metrics are viewed using this PHP Laravel Framework. This system enables hospital administrators to monitor hospital operating data in a user-friendly manner. Therefore, it reduces hospital labour, The HMS's goal in computerizing hospital administration is to transform all paper records into electronic records, the doctor can access them to everything related to the health institution through an internet page, where the first beneficiary of the system is the doctor to be able to follow up on his patients in an easy, simplified and more accurate manner.

Also HMS is to collect the data of the institution in one database. Ease of data retrieval and processing and modifications. In addition to saving data from damage and loss through backup copies and providing protection for it, which leads to the required speed and accuracy in completing the work.

2.   LITERATURE REVIEWS

The previous studies that the researcher reviewed were limited to suggestions for her program and their application in building medical records and designing the system according to the following studies, which we review in order from the most recent to the oldest.

The study focused on designing a web-based information system for patient referrals to addressing the inadequacies of the present typical referral mechanism for patient service. The system was designed to deliver timely and reliable patient data without needing a referral letter from the clinic. The system was created utilizing an object-oriented system design methodology, which successfully addressed issues with referral system circulation and delivered more optimum and integrated referral patient data information and underwent black box testing to ensure user-friendliness and efficiency.

The interface design of The system contained several components, including the main menu page, registration form interface, administrator login page, patient information input interface, doctor information input interface, user information input the interface, diagnostic data inputs interface, referral patients data entry interface, and reporting interface. Through the registration form interface, the system allowed users to submit their data, which was then saved in the patient referral data. The patient data input interface was used to enter patient referral data into the database, while the admin login page was used to handle system data. Researchers employed Unified Modeling Language (UML) tools and object-oriented system analysis is used to examine the study's findings and create the application. In the application design, use case diagrams were utilized to describe the behaviors of the users. [1]

The primary goal of the article is to describe the present problems with Malaysian hospitals' information systems and to suggest blockchain technology as a potential solution. Blockchain technology can deal with problems including data security,patient lifetime health records, and sharing medical data,Blockchain technology enables met consent enforcement by allowing patients to maintain ownership of their data and choose who has access to it. The medical history of a patient cannot be preserved by current methods over time, and data loss is irrevocable.

Although blockchain technology has the potential to improve interoperability and efficiency by offering a synchronized, replicated, decentralized ledger for health data spread across healthcare institutions, a lack of consensus on technical design and infrastructure is a barrier to data exchange in healthcare.

Overall, the article addresses the obstacles in Malaysian hospital information systems and suggests blockchain technology as a solution to these problems. Blockchain technology can enhance data security, patient control over their data, interoperability, and efficiency. The current systems lack adequate security measures and patient-centric control over health data. Implementing blockchain technology can improve decision-making, care, and patient satisfaction. [2]

The results of the research paper indicate that a simple and basic program was developed to manage a system that calculates patient costs in the hospital and keeps track of various details. This program can be used in Iraqi hospitals to support and introduce technology to the healthcare sector. The project has provided valuable insights into the functioning of hospitals, strengthened understanding of database design, improved time management skills, fostered teamwork, and increased confidence in handling real-life projects. The project also highlighted the importance of transitioning from paper-based records to electronic systems, as seen in developed countries.

Overall, the project aims to address the problem of manual record-keeping in hospitals and contribute to the advancement of technology in the healthcare sector. [3]

The paper focuses on the development of an Android-based healthcare application using Android Studio, specifically targeting hospital management systems. The goal of the study is to create an application that can assist people in checking their health-related issues on a daily basis, ultimately improving their health. The application was developed using the App Inventor tool, a visual block programming language provided by Google. The results of the study indicate that the developed system provides an easy and user-friendly interface for end users.

The study also emphasizes hospital administrators' requirements as well as the ecosystem in which they function. It goes through the internal and external environmental aspects that influence day-to-day hospital activities and decision-making processes. High demand pressure, consumer satisfaction, and low profit margins

are among the issues discussed in the article. The study adds to the planning, design, and development of hospital management systems by identifying key variables to consider. [4]

Finding success indicators for Hospital Information Systems (HIS) is the paper's main objective and highlights the performance indicators and difficulties associated with the adoption of Electronic-Hospital Management Systems (EHMS), The EHMS includes modules such as Radiology Management, Blood Bank, Pharmacy, and MIS Interface.

The Radiology Management module stores test results and generates records based on examination outcomes, The Blood Bank module keeps information about blood donation, including donor and recipient details. [5]

To identify the factors influencing workarounds to the Hospital Information System (HIS) in Malaysian hospitals, the study conducted semi-structured interviews with (31) medical doctors in three government hospitals. It discovered five themes that emerged as the factors influencing workarounds to the HIS: typing proficiency, system usability, computer resources, workload, and time, The study came to the conclusion that it is crucial to comprehend these elements in order to reduce work behaviors that might endanger patient safety. [6].

3.   METHODOLOGY

The paper describes a hospital management system project that is primarily focused on managing medical-related records within a hospital. The system integrates inventory and pharmacy information, shows all active personnel and patients, and aids in the tracking of medical reports. A MySQL database and a Graphical User Interface (GUI) created in the PHP, HTML, and CSS programming languages make up its two core components. Unskilled users may utilize the suggested system more easily because to the GUI frame, according also highlights the potential of implementing blockchain technology to enhance data security, patient control over their data, interoperability, and efficiency in hospital information systems.

The proposed system uses the PHP Laravel Framework to view hospital performance indicators daily, allowing hospital executives to monitor hospital operational data easily.

The system contains two main parts: a database created using MySQL and graphical user interfaces created using website programming languages such as PHP, HTML, and CSS. The purpose of using the database is to reduce data repetition, increase consistency, accept large data, and reduce errors, the research includes an explanation of the proposed system and its analysis in the unified modeling language, using a Class Diagram to determine the four parts of the system: Patients registration, Pharmacy, Inventory, and Laboratory medicines.

4.   THE PROPOSES SYSTEM

One of the aims of this work is to develop an integrated data management system for hospitals. This overcomes the majority of the difficulties with older systems. by connecting the system to a MYSQL database,Get Reliability, Powerful Performance, and Large Capacity. In addition, by designing the GUI of the system simply, Easier to handle than necessary Experienced user. software programs used for PHP Laravel Framework and MYSQL, the proposed system is General work of hospital management system (HMS). Installed system Includes two aspects: MYSQL Server and database embedded in GUI Design using PHP.

The system was analyzed using the Unified Modelling Language (UML), which may be made up of anything that helps you describe your system, including pseudo-code, actual code, images, diagrams, and lengthy descriptions. The components of a modeling language are referred to as its notation [7]) .

The provided electronic hospital system employs the proposed algorithms for managing all hospital departments using UML diagram.

5.   THE PROPOSAL ALGORITHM

This part of the research includes an explanation of the proposed system and its analysis in the unified modeling language, as Class Diagram was used to determine the four parts of the system: Patients registration, Pharmacy, Inventory and Laboratory Figure (1) depicts the primary flowchart of the proposed method, with everything explicitly detailed below.
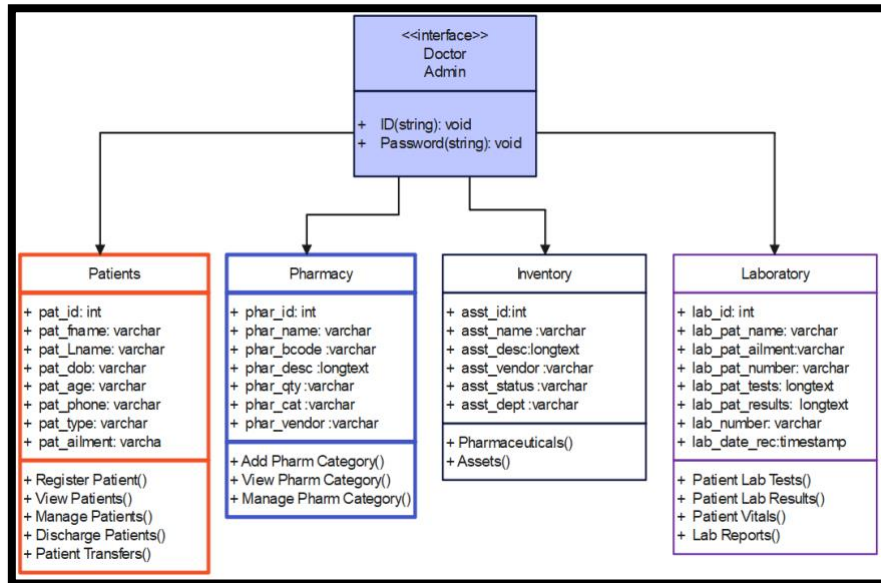
Figure (1): Diagram showing the primary algorithms of the Hospital Management System(HMS) using Class Diagram
Figure (2) illustrates a diagram of the relationships and entities used within the (HMS) system.
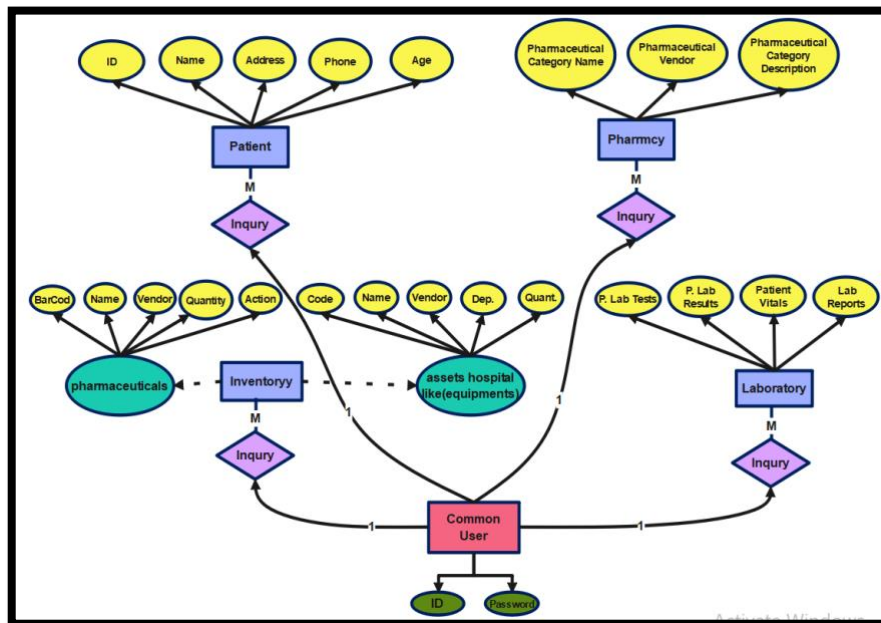

Fig. (2): Flowchart for the primary algorithm of the system

6.   REGISTRATION PATIENTS TO THE DATABASE

Only an authorized individual who is logging into the system using their own account may access this portion of the system.

This system component offers two major processes: one is for enrolling a new patient, and the other is for looking up already-existing patients. The algorithm flowchart for the registration step is shown in Figure (2). At this point, all the crucial data has been preserved. They help us accomplish a lot of our goals. Unaffected by the patient's condition, one of them is preserving background data about the patient's medication history (for instance, Add Patient or Update Patient Information and Viewed). Only patients who have previously registered can be dealt with from the search procedure.
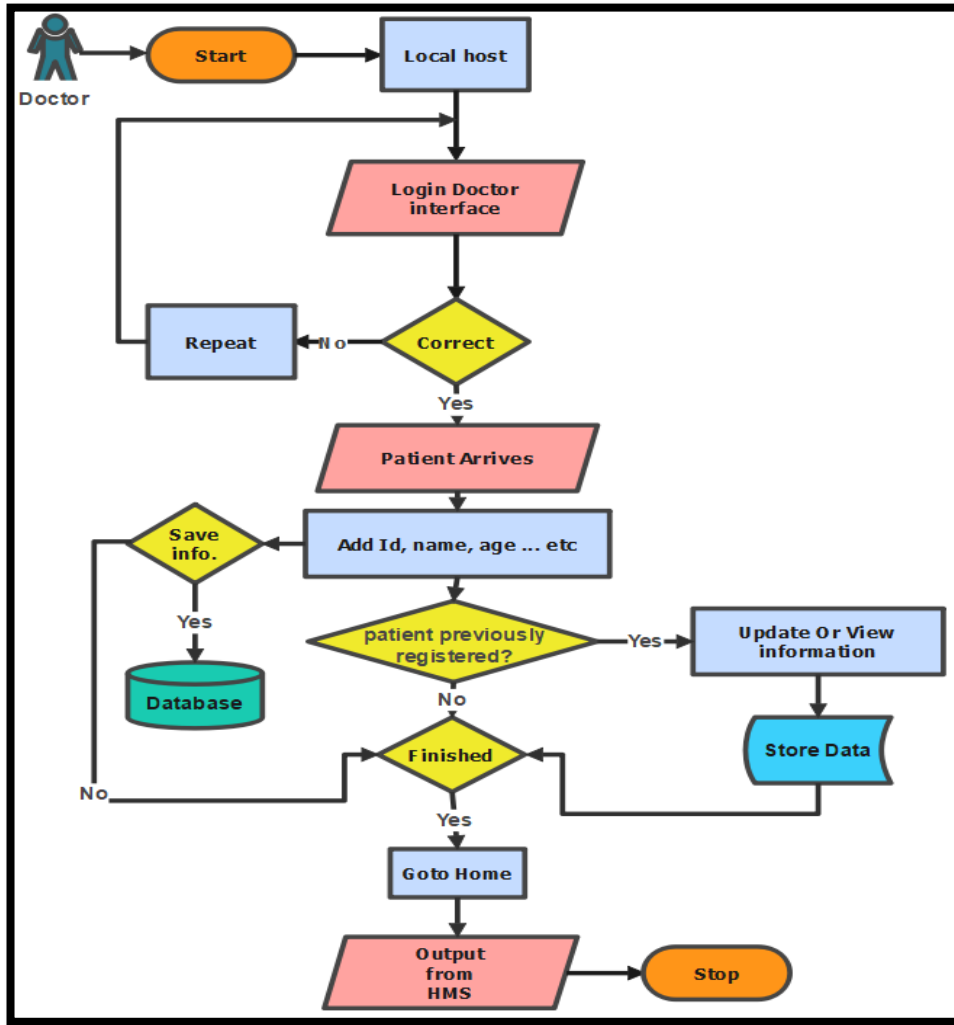
Figure (3): Flowchart for the patient registration method

At this point, the user of the system enters patient data, such as the patient's number, name, residence address, phone number, and the patient's age, As shown in Figure No. (4)
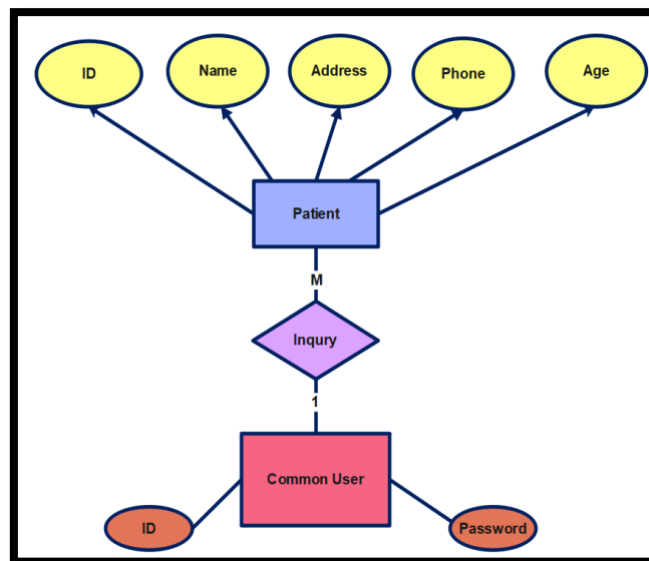

Figure (4): Flowchart of the algorithm for the Patient information

In this scheme, the doctor or the user enters a system page and chooses to add information about the drugs and antibiotics, whether the drug is available or not in the stored drug database. If the required drug is not found, the user will enter the drug as a base in the store, but if it is available Complete information about the drug will be displayed, such as the name of the drug, its number, and its barcode...etc, see Fig. no. (5).

Figure (5): Flowchart of the algorithm about Medicine
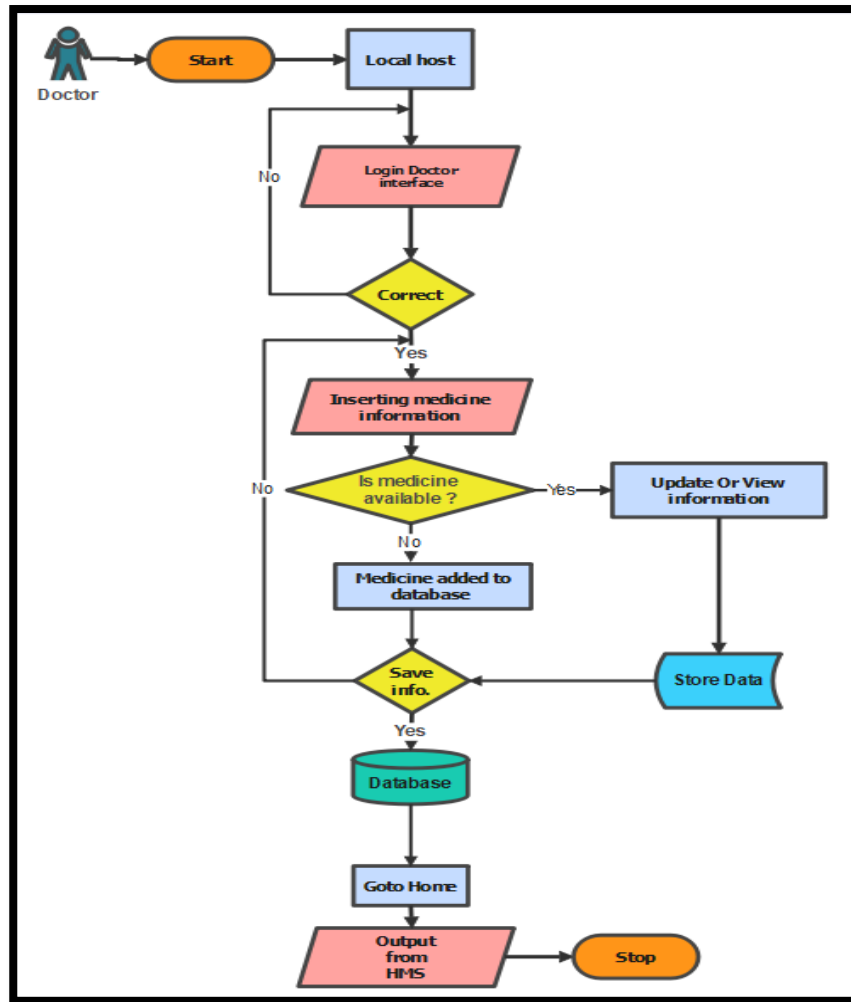
In general, the hospital management system consists of several subsections, such as information about working staff, reports, entering information about a laboratory to take and examine samples obtained from patients, the pharmacy, etc., or as shown in the chart below.
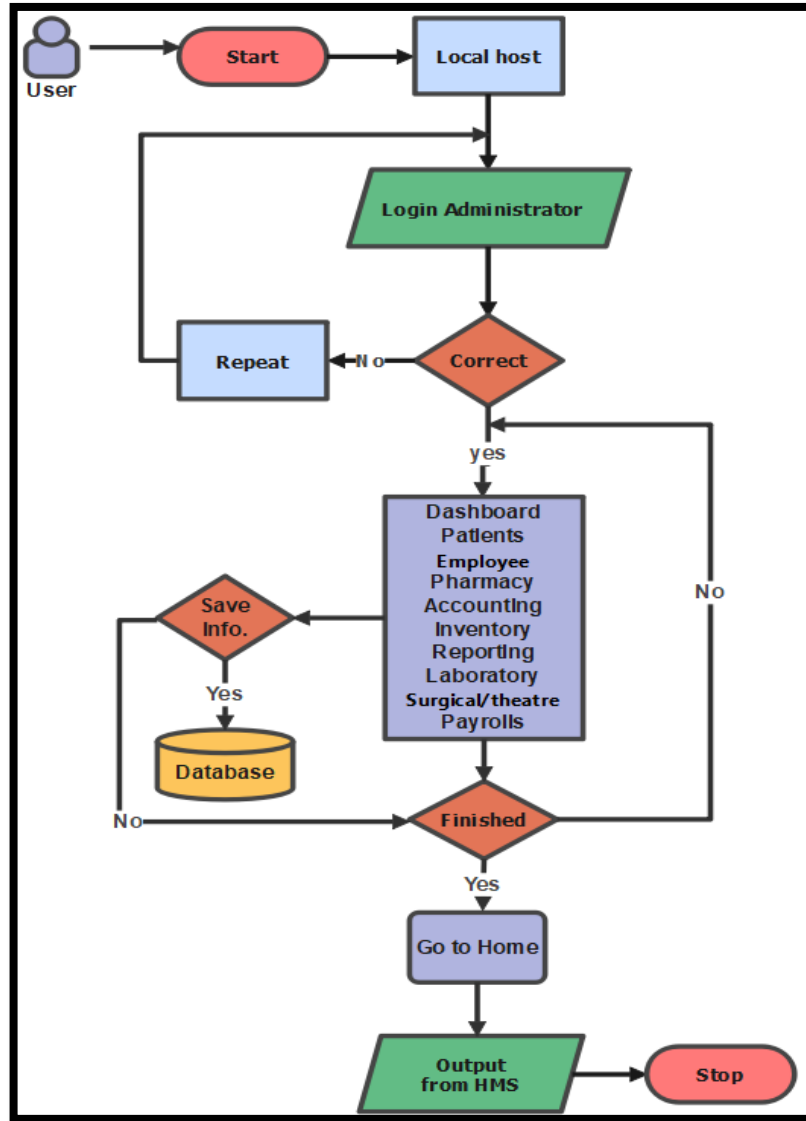
Figure (6): Flowchart of HMS

7.   COMPATIBILITY CHECKING

This section of the research focuses on the system's operational environment, which is composed of two key components:The current machine ran a 64-bit operating system and had 2GB of RAM, making PHP code able to execute on it, which is the web browser for browsing the project interfaces of images, texts, files, and the Apache server, where it deals with the database that was equipped using the MySQL program by creating the tables and then You enter the web browser based on specific permissions for users, according to their job training, and the full authority of the director or supervising doctor.

Table:1 Server PC Compatibility Checking Results

System	Windows 7	Windows 10	Windows 11
Hospital Management System	Windows 7,8 X64- bit or X32-bit	Windows 10 X64- bit or X32-bit	Windows 11 X64- bit or X32-bit
	✅	✅	✅

8. DESIGN GUI

As shown in Figure No. (7), the main page of the proposed system includes three fundamental options: first, Home, Doctors access, and Managers access. Graphical user interfaces were designed and implemented using the PHP environment in conjunction with HTML and CSS, and they were easily integrated with MySQL in the Apache server environment.

Fig. (7) Home Page

Fig. (8), (9) shows, In the second stage, the doctor enters his own number and password, then logs into the system, and after clicking on it, the main screen of the system appears, which contains patient information, the pharmacy, the stored laboratory, ... etc.
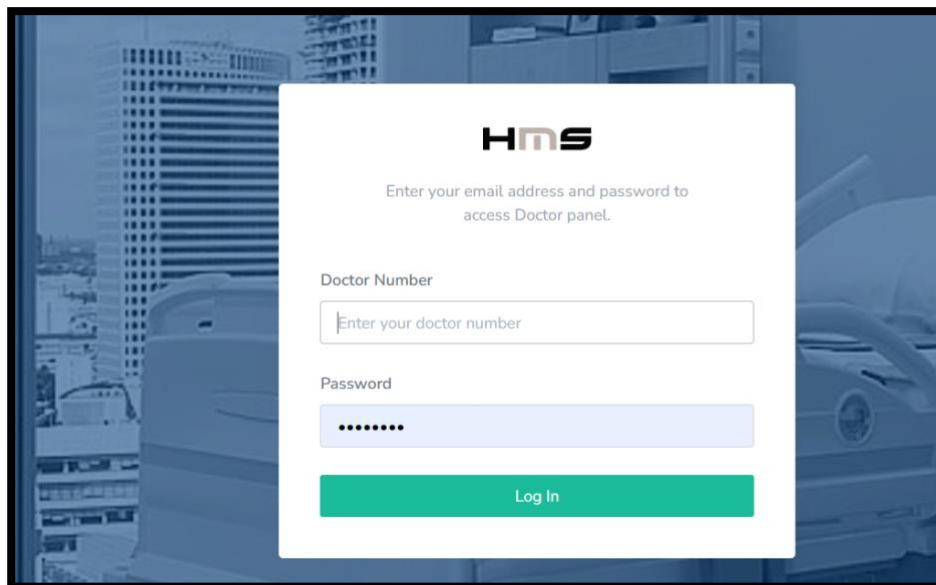
Fig. (8): Login Page
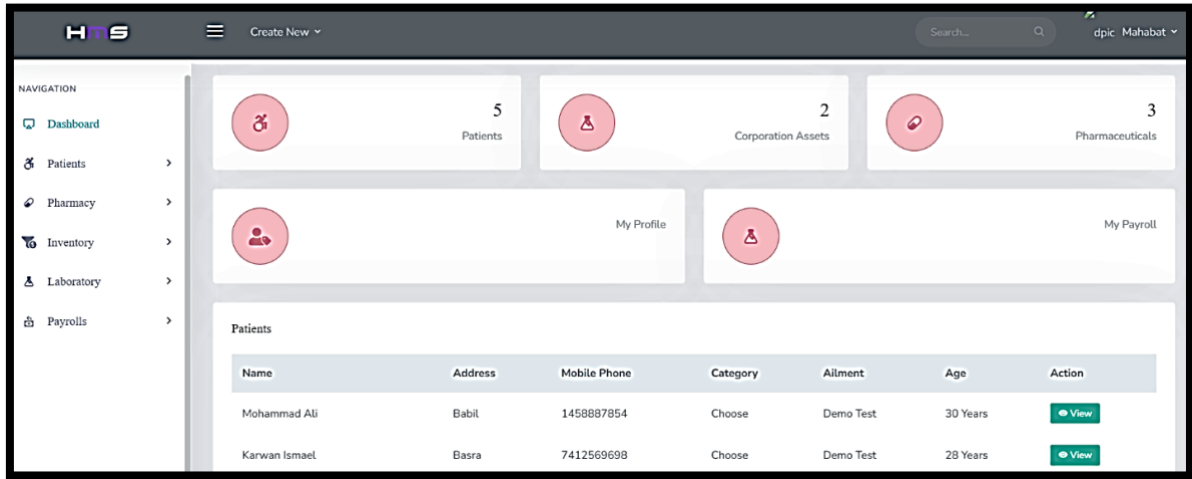
Fig. (9): Dashboard Page

Patient registration page is shown in Figure (10). When a patient comes to the hospital for the first time, the registration staff member fills out the form with the necessary data. Each patient is given a unique number to ensure that their records are not jumbled up.
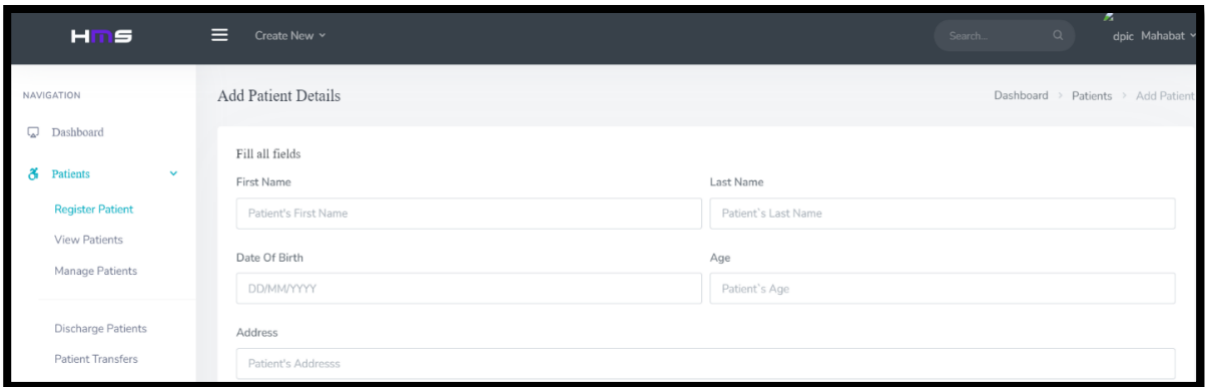
Fig(10): Add new patient page.

Figure No. (11), (12) fill out the special form for the drugs that are stored in the hospital pharmacy as adding a new request and verify the quantity of the drug in addition to entering the information of the pharmacist's barcode and information about the drug seller and verifying the quantity of the drug in the hospital's drug store.
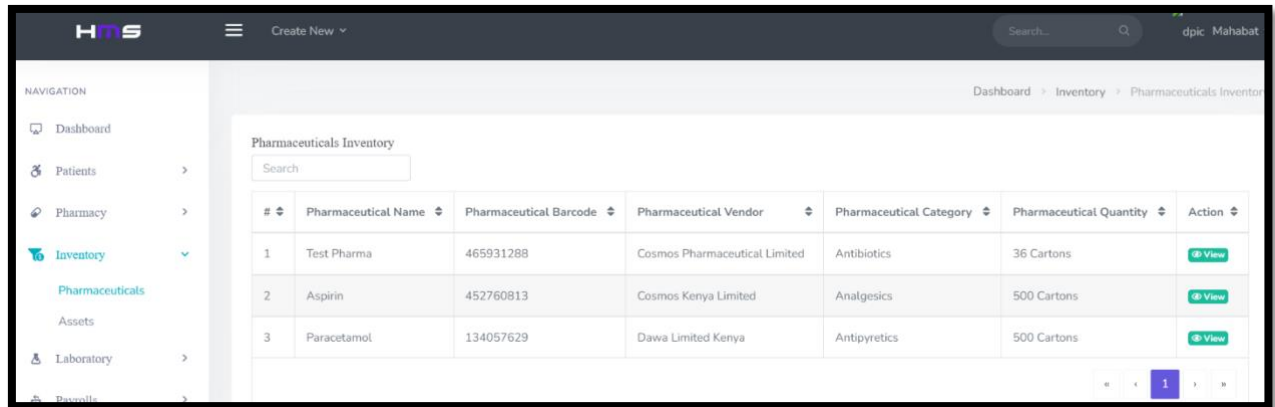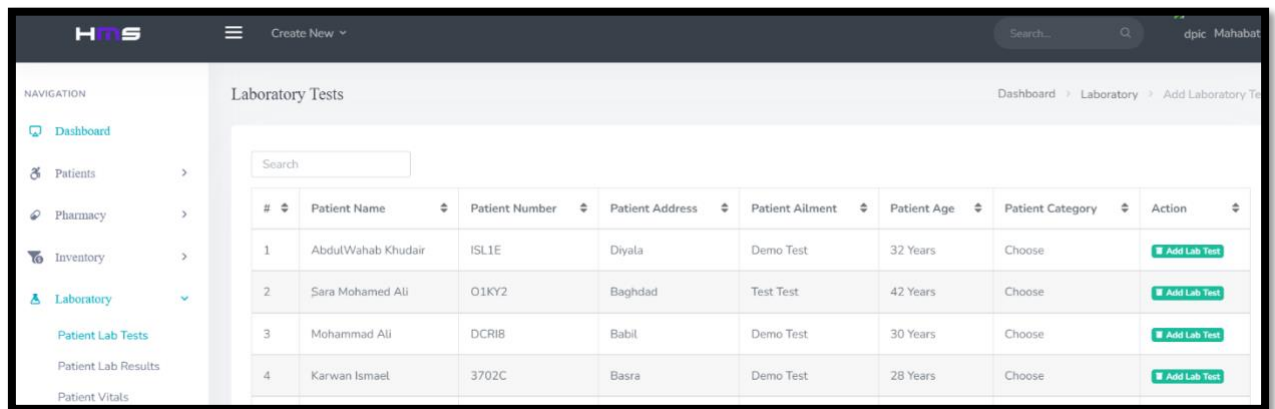

Fig. (11): Medicine part.

Fig. (12): Adding new medicine.

In this part, samples taken from patients are tested in order to examine them and give accurate results about the patient through laboratory examination, where the following information about the patient is entered, such as his number, name, address, type of disease, and age of the patient, in addition to the experimental tests that were carried out on the sample that was taken from the patient, as shown in Figure No. (13)

Fig. (13): Adding examination of the patient.

9. RESULT AND DISCUSSION

The paper discusses the development of a hospital management system using PHP framework, which focuses on managing medical-related records within a hospital, including tracking medical reports, displaying employees and patients, and aggregating inventory and pharmacy records.

The system aims to improve hospital operations by providing a centralized system for managing patient information, treatment records, and sales. It can help hospital administrators make data-driven decisions, improve patient care by providing easy access to information for doctors and nurses, and automate manual processes to reduce errors and improve accuracy.

The main menu page, registration form interface, admin login page, patient data input interface, doctor data input interface, user data input interface, diagnosis data input interface, referral patient data input interface, and report interface are just a few of the components that make up the system's interface design.The paper also highlights the potential of implementing blockchain technology to enhance data security, patient control over their data, interoperability, and efficiency in hospital information systems.

The system has been found to be effective in governmental and private hospitals, with easy-to-use graphical interfaces that reduce human efforts and paperwork.

Overall, the hospital management system discussed in the study has the potential to enhance the effectiveness, precision, and caliber of hospital operations, resulting in improved patient outcomes.

10. CONCLUSIONS

This paper presented a proposal for managing hospitals within and outside the city of Khanaqin, based on a hospital management system using web interfaces.

The system contained two main parts: the database that was created using MySQL, and the graphical user interfaces that were created using website programming languages such as PHP, HTML, and CSS.

The purpose of using the database is to reduce the repetition of the entered data, increase the consistency between them, accept large data, reduce errors and try to avoid them as much as possible by improving access to data by users using the query language.

A password was set to protect information from unauthorized persons, and the graphical interfaces that were designed in the system provided ease of management by users, even if they were not programmed.

The proposed system was tested, recording and entering patient information, issuing medicines, and keeping them in the stores and warehouses of the proposed hospital.

Where the system achieved fewer errors and more effective procedures, which can be summarized in the following points:

  - The possibility of using the system in an effective way in governmental and private hospitals

  - Graphical interfaces are easy to use, which achieves the reduction of human efforts and paperwork (exhibition of loss and damage).

  - The low material cost of the system works accurately and quickly in completing the work compared to the manual system

The system requires an efficient computer and an internet connection in addition to training courses on the use of the system by the hospital staff, including doctors and employees

ACKNOWLEDGEMENTS

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