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Hospital Management System Design and Implementational

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We anticipate that technology is going to keep to have a significant impact on the healthcare industry and hospitals. For this reason, we worked on this project to promote hospital systems generally and do away with the paper system. We constantly see researchers and programmers working in the area of in-formation technology growing and improving this harmonious relationship between health and technol-ogy. We began developing web apps. And some languages to assist us and grant us flexibility in design, like PHP with the aid of Java script and a straightforward addition of and a potent database of a language to complete an effective and integrated system with many features and advantages to eradicate many issues that exist in paper systems as the issue of time, data volume, the speed and quality of work, and many more. We finished a powerful hospital management system that is free from issues and faults, is characterized by dependability, high performance, and is prepared for the future, among other issues that we tried to tackle in the end.

Keywords: Admin, CSS, Dashboard, Employees, Patient, MYSQL, Web-Based Application.

Introduction

At the outset, we must admit that this project has received a lot of attention from senior programmers and researchers in the field of information technology and computer engineering for a great purpose, which is to establish a relationship between health and technology in order to provide the best health care for society free from errors, fast in performance, short time and higher efficiency. At the present time, the most important thing we have is our health, and with the spread of hospitals, whether in the private or government sectors, or the sector of charitable companies to help people, we must contribute to this project and try to develop the idea or project. If we look at the title, we will see a web-based hospital management system similar to the system The current system based on manual paper is a tired and inaccurate system. If we look at it in terms of speed, it is slow in transferring information and in performance. So we proposed a system that is fast in performance, unmistakable and accurate in information. There is also no delay in it at all. It also has a huge database to save information and data in general. An integrated system, we will talk a little about the system. It consists of two platforms. The first platform is the doctor's platform, and the second platform is the administrator's or manager's platform. He is the employee who has the most powers in the system. Each platform can log in to it through an email and a password. The platform contains a control panel at the beginning. The platform consists of several Sections Each

section contains jobs. In the era of globalisation and cutting-edge technology, the importance of effective record keeping cannot be overstated. For instance, retrieving information and discovering specific information is really challenging. To understand the patient's medical history, the user must sift through a lot of data. This is both inconvenient and a waste of time. Additionally, it requires a great deal of time to properly store data coming from multiple transactions. Making many changes to a patient's identifying information may be difficult due to the documentation required. Manual computations are labour-intensive and subject to inaccuracy, which might produce false results. Creating patient bills that take into account, for example, several drug groups and various sessions this becomes a time-consuming and exhausting activity in addition to gathering information because it is difficult to extract data from several documents. Imagine a world where manual processes and printed instructions have been replaced by electronic technology. In the context of inpatient database management systems, this alternative is possible. The development of patient database management system software would benefit hospital administration since it would allow for secure and convenient data access. Hospitals must save their records for legal reasons. Records that include patient information help to keep the medical record of a patient safe. The medical record must fully reflect the patient's whole medical history. Because the record has various uses, doctors must retain accurate records. It works as a communication tool. Serve as a useful source of information for patients. The requirement to maintain all of these documents is exceedingly unreliable, ineffective, and error-prone. It is likewise neither practical economically nor technically to keep such records on paper. Our project's major objective is to make as many as 85 percent of hospitals paperless. Additionally, it aims to provide present systems with trustworthy, reasonably priced automation. The system provides robust and dependable backup and storage capabilities, as well as excellent data security during every phase of user engagement. The Hospital Management System may be used by any hospital to replace their antiquated manual paper system. The system is intended to offer a whole solution for healthcare facilities and services. The system may be used for any hospital, clinic, diagnostic centre, or pathology lab to record patient data and test results. The programme combines many hospital resources into a single, well-rounded entity. In order to use the hospital administration system for this project, patients must be registered and their data must be stored in the system via a database. The programme may manually save each patient's and the staff's information while also assigning each patient a special identification number. Administrators can use name and ID to check whether doctor and patient data are available. The hospital administration system was developed for multi-specialty facilities and comprises a wide range of administrative and organisational activities for hospitals. Additionally, it aims to provide present systems with trustworthy, reasonably priced automation. The technology provides outstanding data protection during the whole user interaction. Additionally, it provides sturdy and reliable storage options. Each patient may be given a unique identification number on the website, and data on them and the staff is immediately saved. Utilising your username and password, you may access the hospital management web application. The Hospital Management Web Application was developed to provide hospitals with the greatest benefits possible. It is robust, flexible, and easy to use. The hospital management online tool, designed for multi-specialty facilities, covers an array of hospital management and administration processes.

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1. Literature Review

Here, many web-based technologies provide the Internet serving almost every field. He can do almost anything online which helps reduce task size, cost and effort. This study effort suggested a Web-based HMS utilizing a mobile application, making it widely available and reasonably priced. The three main parties involved in the health industry – patients, medical personnel, and management: a tool for button-click-based, efficient communication [1]. A comprehensive variety of hospital management and administrative processes are covered by the Hospital Management System, which is developed for multispecialty facilities. It is an integrated end-to-end hospital management system that offers pertinent data across the hospital to enable efficient decision making for patient care, hospital administration, and crucial financial accounting, in a smooth flow [2]. It's certain that our current systems don't provide us the ability to search for information pertaining to hospital records and other crucial papers like prescriptions and test results. We can possibly have some serenity if these documents are nearby. We don't have to fret about lugging those reports anymore, and it will definitely assist us avoid losing those important papers and getting into trouble. Both the benefit and the alleviation will be enormous. Hoping this will provide the advantages we anticipate [3]. Created to help doctors/medical professionals maintain an eye on all patient medical information, including diagnoses, recommended medications, admissions and discharges, etc. In short, this will increase the management's efficiency in everyday work as it can deliver necessary records on time. The new system will handle the care of the drawn-out procedures and tedious labor involved in tracking and obtaining a patient's record in the previous system [4]. The system resolved the issues brought on by the previous manual system. Since authentication is required in order to access the system, security is also improved. The system does not, however, notify the pharmacy of medicine expiration dates. Additionally, the design does not take into account departments like security and assets. Consequently, creating an HMS that can manage all hospital departments and inform pharmacists of the medicine expiration date at a particular moment [5]. It aids in keeping track of and managing the hospital's daily operations and operational efficiency. In addition, it aids in meeting the hospital's urgent needs. By automating complicated tasks and facilitating access to the appropriate information, hospital management systems free up employees to devote more time to patient care. The Hospital Management System was created specifically to fulfil the needs of large and medium size hospitals worldwide [6]. The goal of system design is to specify each component that should be included in the system as well as how those components work together to generate the desired outcome. Producing a representation or model of a system that may be used to create that system later is the aim of the design process. The created model is referred to as the system design [7]. For the purpose of keeping track of information regarding doctors, patients, hospital employees, etc., a hospital management system is crucial. It is anticipated that once the Hospital Management Project was put into action, activity at the hospitals would run smoothly and efectively [8]. The Hospital Management System (HMS) is a computerized system designed to streamline various hospital operations. To provide patients with effective services, the system takes care of all the needs of various institutions. Additionally, it keeps records of the patients' information for a long time [9]. The notion of a web-based platform is discussed in the article, which might be essential for implementing the capability of online medical management. This platform would allow for the online performance of many hospital and medical operations using Web networking technologies.

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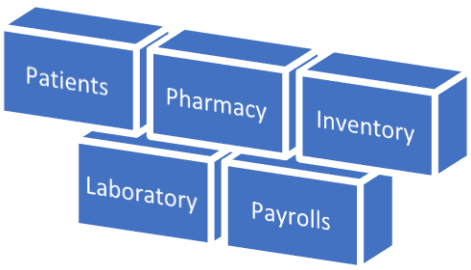
The oversight of doctor schedules, the handling of patients, and the upkeep of patient data that is accessible through the hospital's online patient information storage, leadership, interaction, examination, and update will all benefit from this. Therefore, many things that would take time and be inconvenient may be completed by using this web-based tool [10]. Healthcare is one of these industries where information should be digitized quickly and effectively. This research targets that specific area and sets the path for the development of software that facilitates a simple transition from paper-based to electronic documents. The paper outlines a concept for a web-based platform that would replace the need for paper prescriptions in hospitals and propose E-Medical Management, which would improve patient management efficiency, doctor scheduling efficiency, and provide universal access to patient data throughout the hospital [11]. Pervasive computing anticipates more mobility and geographical transparency for information accessing anytime, anyplace by fusing mobile computing with Web Services technology. However, due to the verbose nature of XML and the physical constraints of mobile computing, a direct integration of two technologies imposes performance limits. We offer a mobile-based hospital administration system that is useful for scheduling medical appointments. The test results highlight the architecture's performance benefit when a session composes a series of messages [12].

As we talked about earlier, there are two platforms, the first is for the administrator, and the second platform is for the doctor. We will talk about the first platform, which consists of several sections, which are the patients and employees department, as well as the pharmacy, accounting department, warehouse, laboratory, health reports department, and other departments, as shown in the figure



This platform is private only for the doctor, and it is the second platform in the system that contains sections that the doctor can access and edit, such as the patients section, the pharmacy section, the store section, the laboratory section, and the payroll section

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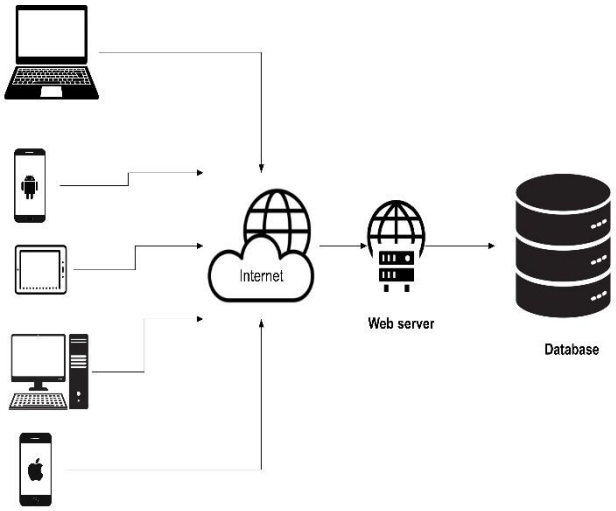
2. MATERIALS AND METHODS

We started by making an integrated, strong, error-free hospital management system, fast and smooth, but now we will talk about the technologies used in our project. In the beginning, we worked on the web-based application technology because there are many reasons for using it. The first of them is that the system can be opened by any browser or web browser. Through any device, whether a computer or mobile phone, etc. Secondly, all users of the system can use the same version and are not forced to install it on the device's memory. Thirdly, this technology has highly customizable interfaces and is adaptable to all circumstances and devices used. Fourthly, it contains a strong, huge, and impenetrable database. Fifthly In terms of maintenance, it is not difficult and easy to update and modify the system.



The way web-based applications work is to first deal with smart devices, then transfer data to the Internet, then transfer data to a web server, and then save the data in a database. As shown in the figure

If we look at these applications, we will see that we use them daily, such as Microsoft Outlook, Google Docs, online payment systems, currency exchange rates systems, Amazon, and many other applications. Now we will come to the backend, and here you should think about your database and how you can contain and maintain it. We chose the MYSQL database because it is the most common and also in terms of source, it is open and can hold huge data with many features and characteristics that suit us in general. For development and expansion sixth, it is very famous and used in all well-known applications such as FLICKR - TWITTER GOOGLE and many other applications seventh and last it is very safe and has high data protection in addition to a quick end in remedying problems. In this section, we will talk in detail about the front-end and the languages that we used in the interface directly. The front-end means the interface that will appear to the user. We used several languages more. PHP was dealt with, the basic language, JavaScript, and also CSS, as well as the Bootstrap framework. We will speak to all of the language completely. We will start with PHP, which is the language through which you can create a lot of websites, and do not forget that it is open source from time to time. Developers discover the additional advantages of it from its advantages. First, it is fast to use. Second, it has a low cost compared to other languages. Third, it is versatile and does not restrict you to a system or browser. Fourth, it is easy to use, smooth, and simple to learn. Fifth, it is understanding and cooperative with all databases, including MYSQL. Sixth, in terms of fame and popularity, most social networking sites

use it. As for JavaScript, it helped us secondarily in the destination, modifications, and texts, and if we come to its definition, it is a programming language that can help it implement difficult commands in websites, in addition to that it increases the visitors of the site because it helps in improving the site by adding pictures, videos, and animations and gives an attractive appearance to the site because it deals with colors, and also you can add music to the site, and it is an easy and simple language to learn and use, and this increases its attractiveness to programmers. And now we will touch on CSS, which is one of the distinctive additions to our project that gave the system luster, aesthetics, and high quality in the effects in the interface of the system, and helped us choose the font, background colors, spacing between paragraphs, and screen sizes, and let's not forget that it can modify all pages with the click of a button. As for Bootstrap, it is a framework that makes websites and web pages very smooth and makes them flexible with all kinds of device screens to adapt to them.

3. System design

In the beginning, we proposed our system to be a system that manages all paper and administrative hospital operations and functions with good features, high quality, efficiency in use, reliability in the system, good work accuracy, free of errors and problems, very fast in use and smooth to help reduce wasting time in the hospital, and most importantly of all, to be an alternative to the systems currently used in hospitals. Expansion and development similar to the difficult paper system, either in terms of accuracy, it will be very high and free from errors, and a schedule will be made for everything in the hospital, whether for patients or employees, so the hospital will not be crowded. This gives comfort to the staff and patients. In addition, patient data will be controlled according to demand and need, as well as a special unit for accounting and payment, and many problems that we have overcome. We designed the system with web-based application technology, specifically in PHP, and we needed secondary help for JavaScript, as well as CSS and Bootstrap help in the front end, we made it have a beautiful appearance that attracts the user, in addition to an interactive, branching and comprehensive interface for all additions. We worked on completing a solid, solid database with high reliability and more security, and we can expand and develop it whenever we want. In addition, it is flexible and easy to use for each platform and for each database section. We dealt with MYSQL, as we previously completed about its advantages and what makes it the right choice not only for us, but for all programmers, and it is the most common. In several diagrams, we will describe the duties of every component of the system or the roles played by each employee in the hospital in accordance with the system. We'll start by describing the doctor's abilities as well as what he can influence in the system using the diagrams in the first figure. We shall discuss the administrator's capabilities and the units that he may inspect and alter in the second diagram. Then, we will explain every strategy for the staff and what their roles are in the system, including the staff member of the warehouse section, the staff of the accounting unit, the chemist, and the surgeon.

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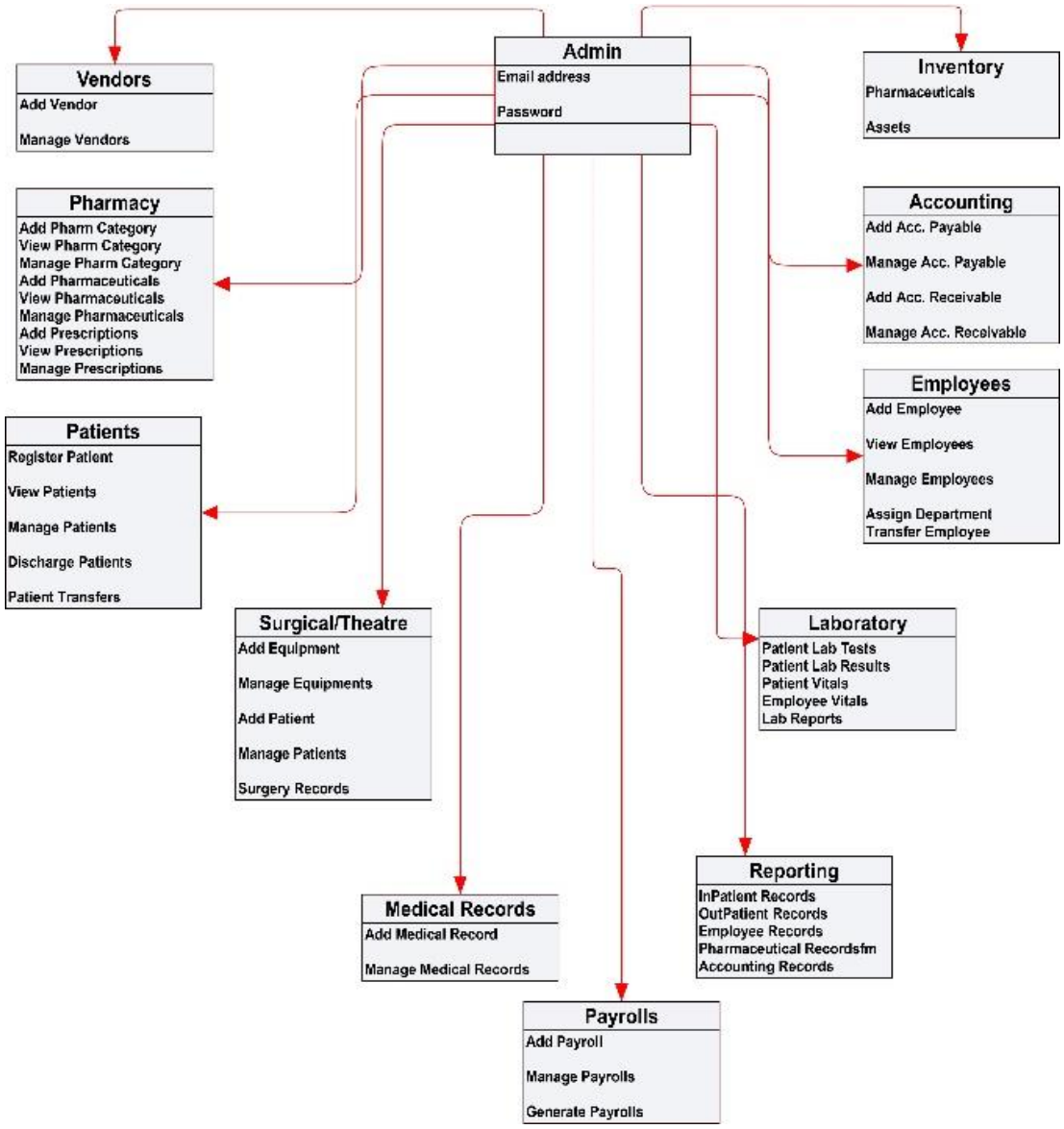

The administrator logs into the system after first entering his credentials, which include his email and password. We shall describe the abilities and capabilities that can be observed and controlled. The parts will eventually be introduced. He can add a staff member, see workers, control employees, and switch staff between a single division to a different one using a way. He can add the payment account in addition to a recipient accounts and handle them using the accounting department's third division. The pharmacy department is the fourth area; here, he may add, view, and handle medications generally as well as modify and regulate prescriptions; next are the section for reports and the shop section. The department in charge of keeping medical records, the laboratory, and all the other departments, as depicted in the plan.

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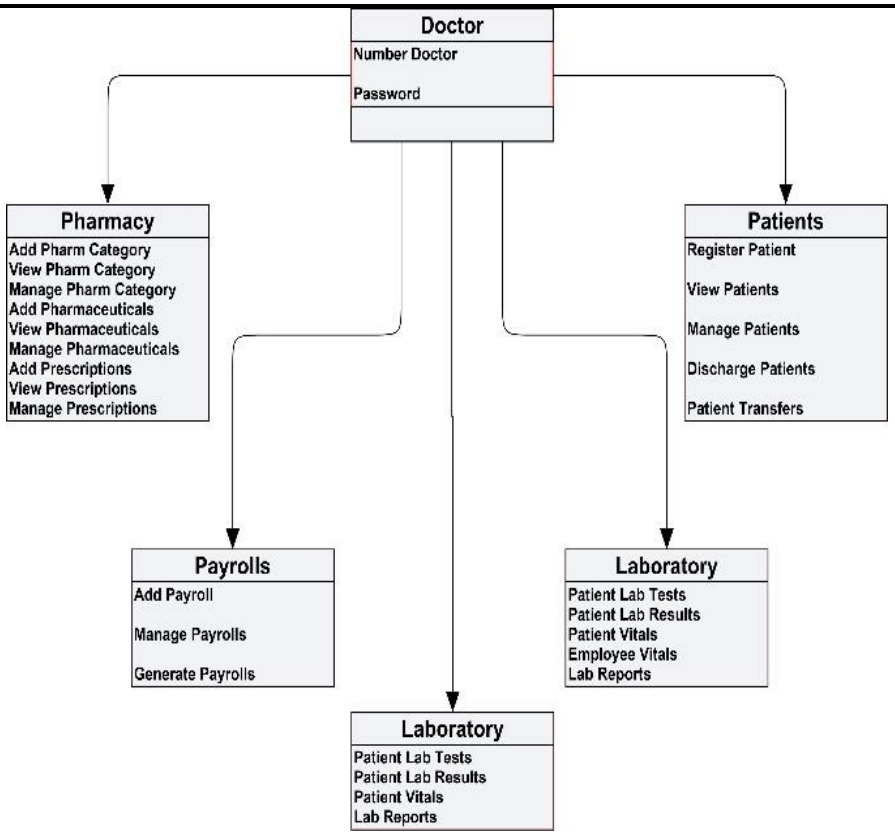

As shown in the diagram at the beginning, any doctor in the hospital can log in to the system through the doctor's ID and his password, and then enter the system and he can access the first section, which is the patients section. He can add a new patient, view all patients, modify them, and change them. The second section is the section Pharmacy, in which he can add, view and manage medicines in general, as well as medical prescriptions, modify and control them. The next section is the laboratory section, which can access the results of all patients' analyses, as well as their vital conditions such as blood pressure, diabetes, and their physical strength. Medicines and the fifth section is the monthly salary section.

4. SYSTEM IMPLEMENTATION AND TESTING

In the implementation, we will see some pictures taken of the system, but at first we must display the system pages, including the home page, and then two login pages pop up, one for the administrator and one for the doctor, and then there are two platforms for the system.

The homepage: The administrator and the doctor are received on this page, which is the initial page in the system. We created a straightforward website with a broad explanation of the system and a summary.

Entry Page: The system has two login sites; the first is for the administrator, and the other one is for the doctor.

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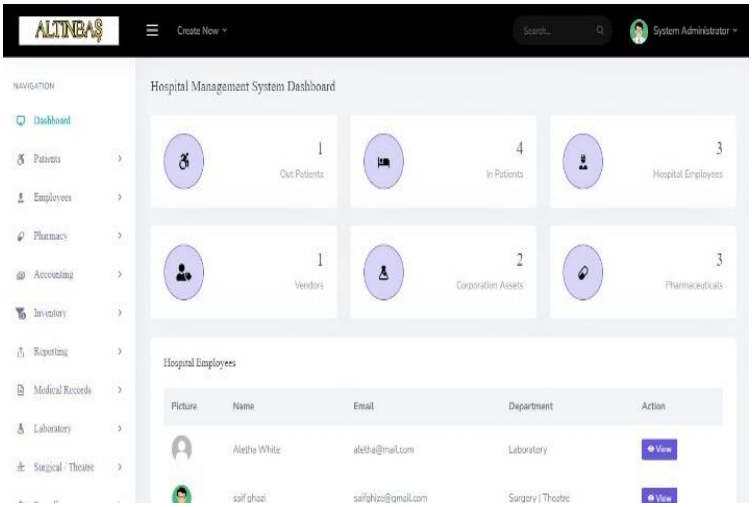
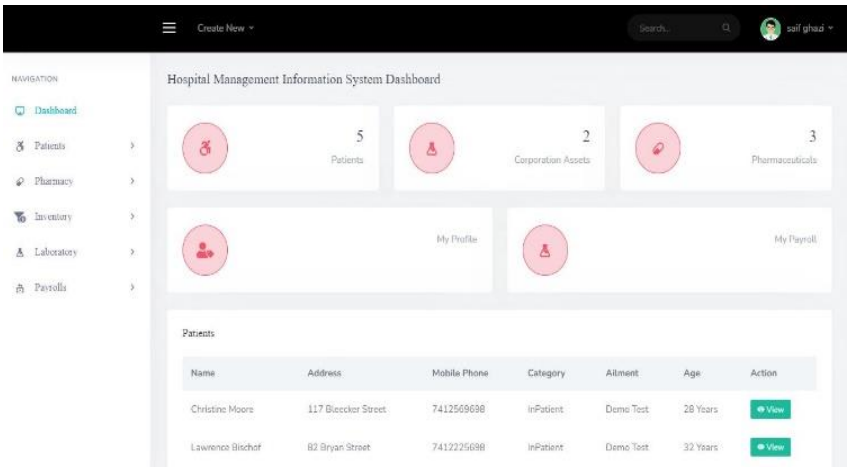


Dashboard for Admins: The admin has more authority than the doctor and has access to all system resources. The administrator oversees all departments and keeps track of all hospital data, including the quantity of patients, staff members, medications, etc. Only he has the authority to add workers, physicians, and surgeons, change their monthly salaries, and oversee them. In addition, he has control over the other divisions, including the shop, pharmacy, and others.



The Dashboard Page for the Doctor: The doctor's abilities and what he may effect in the system are revealed on this page. The hospital metrics also show up when we look at it, although they are not as extended as the administrator. Information about patients can be found in the system. The patients section, the drugstore section, the laboratory and the salary section, the warehouse section, are a few of the parts he has monthly access to.

5. Conclusions

We put in a lot of effort to finish a noteworthy project, from which I learnt a lot and benefitted much. We had numerous obstacles and issues, but we managed to get beyond them. A robust, problem-free, and entirely transparent hospital administration system was eventually constructed. Even if we take into account our time, eliminating of the system of paper and substituting it with an ongoing current technology system is the most significant and difficult challenge. By completing the system to include all hospital departments and working to improve the hospital's

profitability, efficiency, and potential to evolve, we can better align technologies with the health industry as a whole. in regards to safety and dependability in the system, as well as the benefit of expanding the system data.

The lab department, the department of accounting, the warehousing department, the department of pharmacy, and all other sections of the hospital were fully covered. The design and implementation of the hospital management system is the name of our project right now. We began developing front-end web apps in a variety of languages, with PHP being the first. We have included the Java script language to add impacts, 3D graphics, and photos because it is cheap, very quick to use, and compatible with all databases. In addition to using Bootstrap to adjust the website for different screen sizes and device types, we also applied CSS to arrange the design interface and identify the font type. Background MYSQL is chosen as the system's database since it is quite dependable. In order to better treat patients and fulfil all hospital standards, we finally finished the system. The distribution of the system was perfect. When technology is used in the healthcare industry, it will improve job quality, accuracy, and performance while requiring less human labour. I'm hoping that our initiative will contribute to the integration of technology and the healthcare industry, and that we will all be proud of it.

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