# Revolutionizing Hospital Operations: A Comprehensive Analysis of Hospital Management System Implementation

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**Abstract**: *Hospital Management System (HMS) technology will transform hospital operations. This summary summarizes HMS implementation's main components, goals, advantages, and drawbacks. Patient registration, appointment scheduling, EMR, billing, inventory management, and analytics are integrated into the HMS. Its main goal is to improve hospital efficiency, automate operations, and centralize information management. Implementing an HMS improves patient care by providing rapid access to precise information, operational efficiency, financial procedures, and data accuracy. The challenges include comprehensive staff training, strong data security, and smooth healthcare system connection. Healthcare organizations are developing digitally, making the hospital administration system essential for patient outcomes and hospital administration.*

**Keywords:** Hospital Management System, healthcare technology, operational efficiency, data security, healthcare administration

## I. INTRODUCTION

Effective and efficient hospital operations in today's ever-changing healthcare management environment are only possible with technology. The HMS, or Hospital Management System, is the brains behind this change; it is an all-inclusive system that will improve patient care, optimize resource utilization, and simplify administrative work. The many problems that healthcare organizations confront, including managing patient records, appointments, and payments, as well as keeping tabs on Inventory, make HMS so important. The HMS is essential in transforming contemporary healthcare procedures by centralizing the management of many hospital activities.

The HMS allows for the easy gathering and maintenance of patient demographic information, essential for patient registration and other aspects of healthcare administration. Accurate data retrieval and effective record-keeping are the cornerstones of patient-centered care. Another important function that the HMS streamlines is appointment scheduling, which helps optimize resource use and minimize patient waiting times. Hospitals can boost operational efficiency and increase patient satisfaction by automating appointment scheduling operations.

The HMS relies on EMR management to digitize patients' medical records, which include their diagnoses, prescriptions, and treatment plans, as well as their medical histories and other related information. Better data accessibility, more multidisciplinary cooperation, and more informed clinical decision-making are all benefits of EMR integration. In addition, the HMS streamlines and automates other billing tasks, such as handling insurance claims and financial transactions, promoting precise revenue cycle management and transparency.

The HMS allows hospitals to keep tabs on their medical equipment and supplies in real-time, greatly improving inventory management. Reducing stockouts and waste and ensuring key resources are available when needed may help hospitals improve patient care and operational efficiency. Patient outcomes, financial performance, and resource utilization may be better understood using the analytics and reports generated by the HMS. Thus, healthcare administrators are equipped with data that can be used to make educated decisions and achieve continual improvement.

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Literature review, internet research, interviews with healthcare experts, study of industry reports, and synthesis of results are all components of this report's methodology. The purpose of this paper is to provide a thorough analysis of HMS implementation, difficulties, and factors to consider in modern healthcare settings by using various sources of information. When it comes to keeping up with the demands of patients and changing regulations, the Hospital Management System is a game-changer. Hospitals are adopting technology solutions that optimize operations, increase accuracy, and improve patient outcomes to traverse the intricacies of today's healthcare system and provide data-driven, patient-centered care. The HMS is leading the charge in healthcare's digital transformation, which will reshape healthcare delivery in the future via the convergence of innovation and technology.

## II. LITERATURE REVIEWS

This endeavor is referred to as the Hospital Management System. Modules such as patient accounts, doctor accounts, and admin accounts serve as main users as most work is done via computer systems. Patients can schedule appointments online, saving them the trouble of physically going to the hospital. A patient's medical history, financial information, available doctors and medications, available beds, and much more are all stored in this app. Hospital management systems have indeed transformed the healthcare system. Easily adapt it to meet the evolving demands of the healthcare industry by including new features as they become necessary. [1]

This project primarily aims to build a system for the famous hospital Zone. This technology allows most of the hospital's routine tasks to be performed electronically. The principal users of the system are patients, pharmacists, lab assistants, and human resources managers. A system consisting of five modules is used to organize the work of this hospital. That is how medical practices are organized. Other systems can handle healthcare, human resources, reservations, and pharmacies. With these modules, the majority of the tasks are automated. Managing the delivery process and pharmacy information is only one example; other examples include regulating medical information, organizing the scheduling of lab tests, and monitoring patient information. Several requirements, including reporting on laboratory tests, patient appointments, pharmacy data, etc., may be met by the system's precision. Using the search function, this system streamlines the process of sorting information. Every basic duty in a hospital has an answer in the system. An efficient means of storing information for the upkeep of medical records is the primary function of this system. The most important aspect of the system is its capacity to assist the firm with data backup. [2]

The website and tablet-specific software may be accessed through this web-based application. There will be a considerable improvement in patient care efficiency, effectiveness, and timeliness. The patient will not need to lug about bulky X-rays, MRI films, and other reports since everything is already in the system; physicians and patients will have simple access to the data and reports. There is no need to fill out an emergency form since the patient details are already available in the database after registration. The doctors can access patient records online, write prescriptions with a single click, and automatically send them to the pharmacist. This saves time because the pharmacist already knows which medications to stock. Additionally, communication between the Doctor and patient is improved because the patient can access as much help as they need online. Time, money, and effort spent on manual labor will all be reduced. [3]

According to earlier studies, healthcare companies have invested significantly in process orientation, management, and improvement initiatives. They have also used maturity models to enhance learning and structure. Adapting Morton's (1994) organizational dimensions analysis model for hospital organizations, this work aims to review prior research on hospital management maturity models. This analysis used many databases, including Scopus, BDTD, Spell, and the Web of Science. The 305 publications were indexed using the keywords "Maturity Model" and "Hospital management" and published between 2005 and 2019. As far as data extraction and analysis are concerned, forty-one papers met our criteria. Organizational strategy, structure, decision-making, technology, and people comprise the five categories the surveys fall into. Among the organizational dimensions, the technology management dimension was more prevalent in 25 studies. Although several models of hospital management maturity exist, research has shown that most models created for hospital organizations superficially connect to their technical and operational domains. This research adds to the growing knowledge of hospital management and maturity models. [4]

According to the Municipal Corporation's development plan for Mumbai from 2005 to 2025, the city would become a world-class metropolis if more than 400 hospitals and clinics adopt a hospital management information system (HMIS).

With Wave 1 of Phase 1 having achieved a "go-live" status on June 21, 2018, this case study follows a methodology centered on adopting HMIS. The pilot project was started at Film City's Hospital in Mumbai. The e-tender process resulted in the selection of HardSystems and Solutions Limited for hardware implementation and SoftSolutions India Private Limited for software implementation. The findings indicate that several obstacles makemaximizing patient registration into HMIS difficult. These include slow networks and systems, inadequate training after observation, a shortage of data entry operators, and discrepancies in numbering systems in departments such as the blood bank. Although the city's first centrally hosted HMIS in the cloud offers clinical and managerial advantages, management has a considerable problem overcoming employee opposition to technology. As a result, theoretical change models for organizational development must be used. To preserve confidentiality, this instructional case study masks the names of stakeholders, organizational details, and particular events; it also offers unique insights into the application of HMIS in large-scale public healthcare services.[5]

This research launched the hospital administration system, which replaces the present way of sorting, managing, searching, and keeping hospital data. This finishes the essential nature of the computer and its use in the hospital. The database targeted eliminating paperwork in the reception area to decrease the time lost by patients waiting for their files to be retrieved. This also minimized the spacing occupied by the files and gave enough protection for the patient's medical records. Based on the conclusion of this research, the design of hospital patient database records will solve the issue encountered by the existing manual technique of storing patient medical records. The research has critically identified the relevance link with adopting an electronic in storing hospital records to avoid lost files and promote rapid retrieval of patient information. The administration of General Hospital North Bank has decided that the manual technique of storing patient data should be transformed into computerized hospital records, which would assist them in decreasing the inefficiencies connected to the manual system. Through the exhausting investigation and analysis performed in this research, it was proposed that the General Hospital and another medical center providing health care services should have an automated system for successful operation. [6]

A communication and information technology system, the Hospital Management Information System (SIMRS) integrates and processes the whole flow of hospital service processes through a network of reporting, coordination, and administrative procedures. The goal is to help hospitals improve their existing services. The. To improve efficiency and effectiveness, information systems may assist a company in doing various tasks with greater precision, high quality, and punctuality. An evaluation must be conducted to discover the true state of an information system's implementation. This assessment is useful for determining what an information system's implementation accomplished and what more must be done to improve it. This literature review outlines how the Hot-Fit approach was used to assess the effectiveness of hospital management information systems in outpatient services. In keeping with the issues, this study strategy employs a literature evaluation combining descriptive and observational approaches with fourteen relevant research publications. Searching journals using Researchgate and Google Scholar. [7]

A computerized system for hospital administration that addresses the issues with manual methods, such as user authentication and authorization. Data assessment, filtering, record updating and removal, and sensitive information access management are just a few of the numerous manual system issues this system can tackle. Nevertheless, the system needs features that allowadditional staff members, physical assets, and laboratories to be administered. Consequently, future research will focus on developing an electronic hospital administration system that can handle various staff members, laboratories, and physical assets. [8]

With the implementation of several healthcare and Hospital Management Information Systems (HMIS), medical institutions throughout India are quickly transforming the healthcare sphere. However, data interoperability and integration of these separate systems into a single platform for exchanging patient electronic health records (EHR) are prerequisites for the possibility of aggregation and analytics on standardized healthcare information. Problems arise when integrating systems inherently different from one another, either because of operational or policy constraints. Furthermore, the suggested design allows primary healthcare institutions to conduct local, independent installations tailored to their specific needs while syncing critical information to the central node to enable analytics. In addition to improving administration and governance via improved monitoring and control of available resources, implementing this distributed architecture has made healthcare service delivery more consistent and transparent.[9]

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Understanding the resources (such as personnel, beds, and services) at one's disposal is crucial for efficiently operating healthcare institutions and hospitals. In addition, having a dependable interchange information system is essential for responding quickly during crises. One piece of software that came out of the SAFE CARE project, which the European Union sponsored, is the Hospital Availability Management System (HAMS). The primary objective of HAMS is to update internal personnel and first responders (e.g., firemen, paramedics, civil protection, etc.) on the present state of a healthcare institution so that patient flow may be appropriately managed. The HAMS may take data inputs from hospital-deployed event detection systems and immediately update availability statistics after cyber and physical incidents. It considers data from a hospital's typical operations and the spread of consequences among linked assets. Finally, HAMS facilitates open and interoperable data exchange by using the OASIS EDXL-HAVE standard. [10]

The term "smart hospital" has not been definitively defined, although it refers to healthcare facilities that incorporate cutting-edge ICT technologies into their operations. This research aimed to identify the various kinds of smart hospital services, define smart hospitals, and examine smart hospital instances. Here are some ways that smart healthcare services are categorized: Services that utilize location recognition and tracking technology to measure and monitor an object's location data through short-range communication; Internet of Things (IoT) services that link physical items equipped with sensors and communication capabilities to the web; services that use ultra-fast communication networks built on cutting-edge wireless communication technologies; Health services that make use of mobile devices, such as smartphones, tablets, and wearables; Robotic medical assistant services; medical practice that makes use of extended reality to implement hyper-realistic immersive technologies; AI-powered illness prediction and diagnostic services; and distant medical care using electronic networks. By developing and quantitatively assessing certain indicators using data gathered from current hospitals, "smart" hospitals may shape health and healthcare policy while producing new medical value. To promote and enable smart hospitals, businesses must engage actively, consolidate multidisciplinary research, and provide suitable government incentives. [11]

A computerized system that is structured and programmed to handle the day-to-day operations and management of the activities of a hospital is known as a hospital management system. The software can handle everything from inpatient and outpatient records to database treatments, status illnesses, lab and pharmaceutical billings, and more. Additional data stored at the hospital includes ward IDs, chief medical officers, and department heads. These days, patients need help getting their reports following consultations since many hospitals keep them in their system, but patients can only access them inside the office. The ability to save the report to a database and access it from any location is an additional feature that will be implemented in this project.[12]

The administrative portion of this system allows for the management of users, pharmacy systems, health program administration, appointment scheduling, and lab test booking. This approach allows the admin to customize reports to meet his requirements [7]. A separate module might track the hospital pharmacy's medication inventory; another may handle the admission bills and pharmaceutical payments. Because hospitals are involved with people's everyday lives and routines, manual records managementcould be more efficient and error-prone, which is a problem. This project aims to bring routine tasks online or automate them. Scientists could better plan the study's development and execution thanks to the steps taken at each stage. Finally, the study's authors concluded that the method could increase hospital staff's efficiency and output. It may also provide reports for hospitals, giving users a snapshot of all the transactions that took place during a certain time frame. Additionally, it allowed the receptionist module to search for the patient's data when they inquired. Due to the system's potential to lessen hospital burdens, management and productivity might improve. Better improvement of hospital transactions was the overall outcome of the investigation. Someone has suggested that theywork on the system's front end.[13]

Since it is founded on linking living and nonliving objects together via computer technology, the Internet of Objects (IoT) permeates almost every aspect of existence. Connecting real-world items over the web is its job. There has to be a major push to modernize the healthcare and hospital industries' antiquated documentation practices into SMART management systems. To improve the standard of treatment for patients, it is crucial to examine health records. Egypt is beginning to replace its antiquated governmental processes with computerized SMART technology, reflecting its status as a developing nation. Internet of Things (IoT) devices send data to the cloud for further processing and storage. Hospitals use the Internet of Things (IoT) to gather, transmit, and analyze patient data, drawing many researchers. Consequently, there is a growing need for healthcare service arrangements that are both smarter and more cost-

effective. When applied to healthcare data, the Internet of Things (IoT) presents several issues, including privacy and security, device connectivity, and data collecting and administration. So, to get the most out of it, a reference model for creating SMART hospital management systems must be built. All the many parties participating in the hospital management system have their functional and non-functional needs taken into account by the model. [14]

With the implementation of several healthcare and Hospital Management Information Systems (HMIS), medical institutions throughout India are quickly transforming the healthcare sphere. However, data interoperability and integration of these separate systems into a single platform for exchanging patient electronic health records (EHR) are prerequisites for the possibility of aggregation and analytics on standardized healthcare information. Problems arise when integrating systems inherently different from one another, either because of operational or policy constraints. Through electronic health record (EHR) sharing and aggregating standardized data for analytics and visualization, this study introduces a distributed HMIS architecture that allows the integration of several standalone HMIS on a single platform, hence facilitating interoperability. Furthermore, the suggested design allows primary healthcare institutions to conduct local, independent installations tailored to their specific needs while syncing critical information to the central node to enable analytics. In addition to improving administration and governance via improved monitoring and control of available resources, implementing this distributed architecture has made healthcare service delivery more consistent and transparent. [15]

In rural locations, there is a need for more competent medical professionals, which has a direct impact on the hospital administration system. People, in general, are also having trouble getting to health screenings because of the current COVID-19 pandemic issue. According to a recent analysis, The doctor-to-patient ratio in India is far lower than the World Health Organization recommends. According to the World Health Organization, one Doctor for every thousand patients is the recommended ratio in healthcare facilities. According to the most recent data, India has a ratio of 1:1445. In addition, medical professionals are legally required to have personal protective equipment (PPE) while dealing with coronavirus patients. The Indian ordnance manufacturers are still unable to produce enough personal protective equipment kits, which is a major problem for India. One possible solution to this problem is an Internet of Things (IoT) based system that might help alleviate the scarcity of doctors in certain healthcare settings. The Internet of Things system is a wearable gadget that patients may use to track their vitals, including their temperature, heart rate, and oxygen saturation levels. Any Internet of Things (IoT) server, such as Thingspeak, or any other server, such as Adafruit, may receive and store the data in the cloud. [16]

According to this research, hospitals can improve their management of people, money, and materials by developing an all-encompassing operation management platform and implementing a novel set of operational management decision-making systems. This will allow the hospitals to handle their complex business data better. When managing a hospital, there are four main areas to focus on: management, HRM, business analysis, and decision-making. This decision-making system aims to optimize the hospital's resources and operation mode by overseeing all aspects of personnel, finances, and materials. In addition to enhancing the hospital's information construction and long-term viability, the system may provide solid assurance for the facility's steady, secure, and healthy financial operation. Ultimately, the goal of successfully improving the hospital's overall operation management, achieving refined management, strengthening the hospital's core competitiveness, and integrating business and finance is accomplished. [17]

## III. PROPOSED SYSTEM

### 3.1 Methodology

the methodology used to deploy the Hospital Management System (HMS) is integrative in nature and aims to improve patient care and organizational operational efficiency across the facility. First, the Admin Module is deployed, which centralizes day-to-day administrative operations ranging from the scheduling of the operation theatre to optimal resource use and smooth surgical workflow. Simultaneously, the Drug Management Module is applied to ensure patients' well-being in terms of pharmaceutical prescription management, control of inventories, and replenishment of supplies to maximize the treatment's efficacy.

Next down the line is the Doctor Management Module, where easy management of provisions and proper scheduling of the patients, physicians, and patient details take place. This module helps the receptionists manage the appointments and details of insurance, and the Doctor manages his calendar, tracksthe patient's diagnoses and keeps the treatment

being provided to the patient effective. At the same time, the Department Management Module coordinates and consolidates functions across the many departments in the hospital, therefore ensuring more collaboration and teamwork in the delivery of processes in the patient care process.

The Patient Module contains the handling of valid information about patients. This enables the creating and storage of respective patient records containing demographic, medical, and other necessary information. This information integrated into a centralized database ensures that health practitioners can easily retrieve such data from patients to improve ways of serving them. Insofar as the diagnosis module is concerned, it stores and manages the diagnostic information that lab results, imaging tests, and many others generate. The diagnostic findings will be associated with the respective patient records, and this generated information will be available to healthcare professionals for diagnosis and follow-up care.

Additionally, the Billing Module is implemented to effectively streamline the billing process of patient care, allowing the management of billing for doctor appointments, accommodation, medications, and lab testing to allow effective and accurate processing of financial transactions. Finally, there is the Receiving Module, an interface of the HMS allowing data exchange among all modules, connecting departments, and informing patients and facility staff on how to use the service.

This comprehensive approach benefits the health facility, including the strategic approach to different HMS modules, given optimized workflow, enhanced patient care outcomes, and operational efficiencies across the organization.

## 3.2 Data Flow Diagrams

A data flow diagram is useful for hospital administrators as it shows how data and operations move across a healthcare facility. Health, healthcare, medical instruments, pharmaceutical tools, transportation, medication, medical icons of people, human anatomy, and many other healthcare-related topics are all represented by the vector pictograms and color samples that make up the design. The diagram's pre-made flowchart components, connections, and arrows further lend it credibility for use in medical workflow design. The main goal of this data flow diagram for hospital administration is to provide a high-level picture of the processes involved in hospital management without going into too much detail.
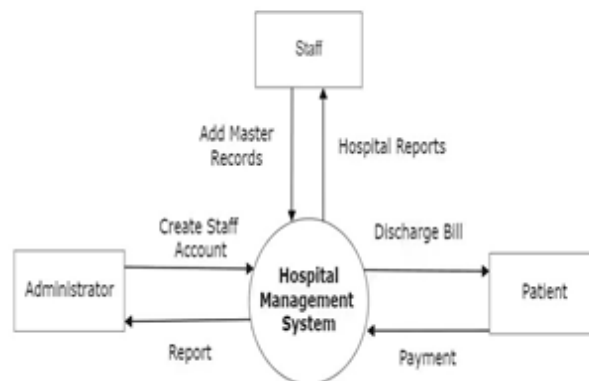


Figure 1: Context Level DFD for HMS

The data flow diagram shows the hospital administration information flow. First-time users include patients, physicians, and administrators. Outside parties start patient registration, appointment scheduling, medical diagnosis, treatment, and billing at the hospital.

The hospital management system data flow diagram depicts the interaction between databases, software, and hardware. From the registration desk, the hospital database maintains patient registration information. EMRs, medical technology, and doctors discuss patient diagnoses and treatments.

The data flow diagram links hospital departments, including OPD, IP, medical, nursing, and paramedical services. This example shows how divisions share data and resources to ensure patient coordination and care.

The hospital management data flow diagram, which shows all operations and interactions in a healthcare facility, may help stakeholders enhance patient outcomes, streamline procedures, and identify opportunities for improvement. Its color samples, vector pictograms, and symbols promote clarity and comprehension, making it useful for healthcare workflow management and analysis.
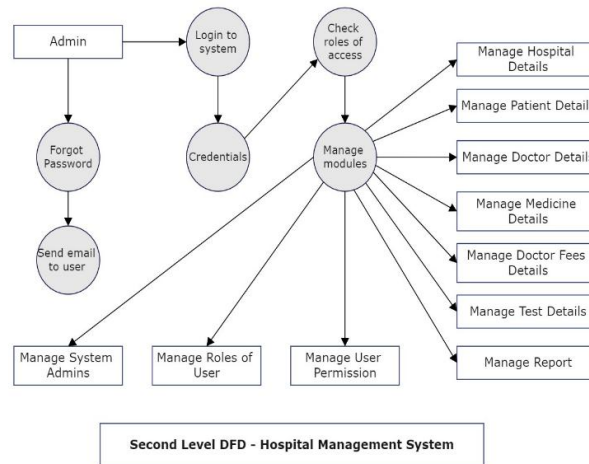


Figure 2: Second-level DFD for HMS

The Hospital Management System's (HMS) second-level data flow diagram (DFD) shows all features and their interactions. The diagram covers user authentication, system administration, module management, user permissions, reporting, and hospital and patient management. System administrators may log in and manage their credentials securely from the start, including password recovery. After verification, administrators may regulate other administrators' responsibilities and permissions, collect patient data, and ensure the hospital runs smoothly. Administrators may also manage system modules for doctors, prescriptions, tests, and fees to ensure accurate and up-to-date information. Permissions are carefully managed to provide employees access to benefits. Report management tools allow administrators to develop and assess critical reports for analysis and decision-making. The second-level DFD details HMS processes and interactions to aid system design, deployment, and administration.

**3.3 Modules of the System**

The hospital used the Hospital Management System (HMS) to improve patient care and operational efficiency. These modules are essential for optimizing healthcare facility-wide workflow, resource management, and enhancing efficiency.

- Admin Module: The administrative module runs the hospital's day-to-day operations. For example, it can be used to see whether operating theaters are available online. Automating operation scheduling optimizes surgical procedure workflow and guarantees effective usage of operating room resources.
- Module on Drug Management: Proper drug management is essential for patients' well-being and their treatments' efficacy. Ensuring patients take their drugs appropriately to achieve the expected therapeutic results is the responsibility of this module, which controls pharmaceutical prescriptions. Its support makes it easier for inventory management, prescription consumption tracking, and timely supply replenishment.

This module of the doctor management system makes it easier to keep track of patients' information, as well as physicians' schedules and appointments. For receptionists, itis a way to manage patient appointments, insurance information, and appointments that go differently than planned. It helps physicians organize their calendars and monitor patient diagnoses and treatments.

Hospital departments handle distinct tasks. This module may better organize and control OPD, IP, Medical, Nursing, and Paramedical. Communication and coordination across departments promote patient care efficiency.

The patient module is essential for accurate patient data management. It may add new patient records and securely preserve demographic, medical, and other data. Healthcare providers may readily access patient data via this module's centralized database, improving patient management.

Diagnosis Module stores and manages lab results, imaging tests, and other diagnostic information. It links diagnostic findings to patient records, providing clinicians with greater data to treat and track patients.

This module simplifies patient care billing, an important hospital administrative task. It bills patients for doctor appointments, housing, medicines, and lab testing. This module ensures timely, transparent, accurate invoicing and financial transaction processing.

The HMS's receiving module controls data transmission between system components. It connects departments and informs patients and staff about each module.The modules enhance hospital administration, patient care, and operations.

## IV. RESULT

The results of the proposed hospital management system are presented in this section.

The system's home page is in Fig. 3. The homepage consists of a tab for Doctors' login and Administrator login.
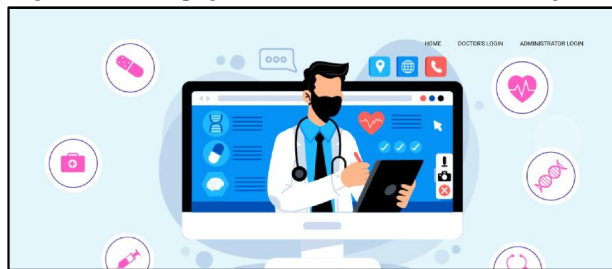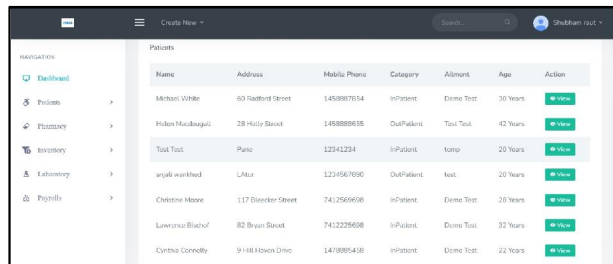


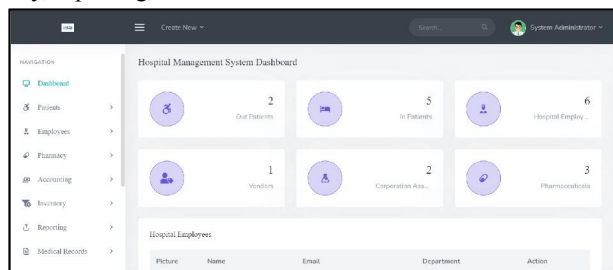Figure: Home page of Hospital management system

In the Doctor's login, the Doctor can see the patient's information, such as name, address, mobile phone, categories (inpatient/outpatient), ailment, age, and action. The Doctor's login page is shown in Fig 4.



Figure: Doctors Login page of the proposed system

The admin page of the Hospital Management system consists of the information onthe Dashboard, patients, employees, pharmacy, accounting, Inventory, reporting, and medical records.



Figure: Admin login page of the proposed system

## V. CONCLUSION

The introduction of the Hospital Management System (HMS) would mean that the health facility has a toe-in in the world of technology and, hence, a sharper incline in management, delivery of patient care, and resource management efficiency. The HMS modules include Admin, Drug Management, Doctor Management, Department Management, Patient, Diagnosis, Billing, and Receiving, which help simplify all processes and hence foster communication and decision-making right from the grassroots of an organization.

By centrality of administrative tasks, maximizing resource utilization, and automating the scheduling process, HMS will greatly help hospitals enhance their day-to-day activities. Other Drug Management and Diagnosis modules will enhance patient care as theyhelptrack and ensure that proper medication and diagnosis information are given to provide clinicians with comprehensive data for treatment.

It indicates that the patient-centric approach that HMS would display through the Patient Module would enable improved management of the patients and their outcomes since there will be accuracy and security brought forth in managing the data that regards the patients. Besides, the transparency and timeliness of the Invoicing Module will guarantee improved financial management of the patients and the hospital.

Modern healthcare facilities depend highly on an HMS for effective patient care and operations. This will enable the institution to use HMS to increase its effectiveness, minimize errors, and improve health care for all patients and providers.

## REFERENCES

[1]. Anuj Tiwari, Saransh Mahajan, Vivek Kumar, Priyanka Behki, "Modern Hospital Management System," Researchgate.Net/Publication, 2023

[2]. K.Nishanthan, S.Mathyvathana, R.Priyanthi, A.Thusara, D.I. De Silva and Dulanji Cooray, "The Hospital Management System," International Journal of Engineering and Management Research, 2022

[3]. PranjaliAnpan, Roshni Udasi, Susneha Jagtap, Shon Thakre, ChalikaKamble, "International Research Journal of Engineering and Technology (IRIET)", 2020

[4]. Luciano Trentin, GérsonTontini, "Hospital Management Maturity Models: Literature Review", Base – Revista De Administração E Contabilidade Da Unisinos, 2021

[5]. Lakshya Arora, Feroz Ikbal, "Experiences of Implementing Hospital Management Information System (Hmis) At A Tertiary Care Hospital, India,"Vilakshan – Ximb Journal of Management, 2023

[6]. Kumaran,Dr.Pusphagaran,KalaiSelvi,Christopher,Deepak, "A Study of Advanced Hospital Management System," IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), 2017

[7]. Ida Herwati, JennylaPuspitaning Ayu, LuthfiyatulMustafidah, ListiyawatiRatna Ningrum, Indah Nur' Aini, Muhasim, LailatulKodriyah, "Evaluation of The Implementation of Hospital Management Information Systems: Literature Review," International Journal of Scientific and Research Publications, 2022

[8]. Jayasiri K.C.N, Thathsarani WRVK, De Silva D.I.3, and Vidhanaarachchi S, "Design and Implementation of An Automated Hospital Management System with Mern Stack," International Journal of Engineering And Management Research, 2022

[9]. Sumit Soman, Priyesh Ranjan & P. K. Srivastava, "A Distributed Architecture For Hospital Management Systems With Synchronized Her,"  CSI Transactions On Ict, 2020

[10]. Francesco Lubrano, Federico Stirano, Giuseppe Varavallo, Fabrizio Bertone &Olivier Terzo , "Hams: An Integrated Hospital Management System To Improve Information Exchange",  Complex, Intelligent And Software Intensive Systems, 2020

[11]. Hyuktae Kwon, Sunhee An, Ho-Young Lee, Won Chul Cha, Sungwan Kim, Minwoo Cho, And Hyoun-Joong Kong, "Review Of Smart Hospital Services In Real Healthcare Environments,"Healthc Inform Res. 2022

[12]. P. K. Yadav and R. Kumar, "Online Hospital Management System,"Ssrn Electronic Journal, 2022

[13]. K.Nishanthan, S.Mathyvathana, R.Priyanthi, A.Thusara, D.I. De Silva, And Dulanji Cooray, "The Hospital Management System," International Journal of Engineering and Management Research, Vol. 12, No. 5, 2022

**[14].** D. Rizk, H. Hosny, S. Elhorbety, And A.-B. Salem, "Smart Hospital Management Systems Based on Internet of Things: Challenges, Intelligent Solutions,and Functional Requirements," International Journal of Intelligent Computing and Information Sciences, Vol. 0, No. 0, 2021,

**[15].** S. Soman, P. Ranjan, And P. K. Srivastava, "A Distributed Architecture for Hospital Management Systems with Synchronized Ehr," CSI Transactions on ICT, Vol. 8, No. 3, 2020

**[16].** Singh, "IOT Enabled Smart Hospital Management System for Covid-19 Patients," Turkish Journal of Computer and Mathematics, 2021

**[17].** X. Luo and C. Jiang, "Design of Hospital Operation Management System Based on Business-Finance Integration,"ComputIntellNeurosci, Vol. 2022

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