

Computer based Hospital Management

¹Manas Tripathi,

¹Department of Computer science Engineering, R. D. Engg. College, Duhai, Ghaziabad, U. P.
India-201206

Corresponding author-manastripathi@gmail.com

ABSTRACT

The hospital's operations are managed and automated by the abstract hospital management system, which is a sustaining system. It deals with gathering patient data, including diagnosis specifics, etc. The system's primary purpose is to register, store, and retrieve patient and doctor information as needed, as well as to change this information in a useful way. While system output is to display these details on the screen, system input contains patient and diagnosis-specific information. With the use of a login and password, one can access the Hospital Management System. A receptionist or an administrator can access it. They alone are able to add data to the database. The information is simple to retrieve. The processing of personal data is made possible by the data's high level of security. A hospital or healthcare facility's internal healthcare operations can be streamlined and automated with the use of hospital management systems (HMS), which are computer-based information management systems. An outline of HMS's advantages, difficulties, and potential solutions is given in this study. Patient registration, admission, discharge, billing, inventory management, medical records management, and appointment scheduling are just a few of the features integrated within the comprehensive HMS system. The technology increases hospital operations' efficiency, lessens paperwork, and eliminates errors, resulting in better patient care. HMS offers patients and healthcare professionals a number of advantages. It makes it easier for doctors to quickly and accurately retrieve patient information so they can decide how best to treat their patients. Additionally, the system optimises patient safety, fosters collaboration among healthcare professionals, and provides a platform for data analysis.

Keywords- Hospital management, Healthcare facility, Dealing patients

INTRODUCTION

A hospital's everyday operations are managed and maintained by a software programme called a hospital management system (HMS). In order to provide effective and efficient management of the hospital's resources, the system assists in managing the medical, administrative, financial, and legal aspects of a hospital. The HMS has a number of modules, including ones for staff management, pharmacy management, appointment scheduling, medical billing and coding, patient records management, employee management, inventory management, and many

others. The centralization of information, which makes patient data easier to access and administer, is one of the main advantages of an HMS. This guarantees that all medical records, diagnoses, prescriptions, and other pertinent data are kept in a safe, orderly manner, and are only available to authorised staff.

A computerised system called a hospital management system (HMS) aids healthcare organisations in more effective management of their daily operations. The system offers resources for handling a number of hospital operations-related tasks, such as patient registration, appointment scheduling, medical record administration, billing, and inventory management. HMS is intended to improve patient care by streamlining a hospital's daily operations. It connects many divisions, such as administration, financial, medical, and support services, to produce a holistic system that improves a healthcare organization's overall effectiveness. The system seeks to increase the standard of patient care, decrease wait times, and cut down on billing and medical record inaccuracies. The ability of an HMS to manage patient data electronically is one of its main advantages.

Various administrative, clinical, and financial components of a hospital or healthcare institution can be automated and managed by a software programme called a hospital management system. This approach contributes to improved efficiency, better patient care, and hospital operations that are streamlined. A hospital management system's main objective is to enhance patient outcomes by giving patients, staff members, and medical professionals fast and accurate information. Additionally, it enhances patient safety, lowers medical errors, and streamlines hospital operations. Additionally, it offers a safe and dependable platform for handling patient data and facilitating interprofessional collaboration.

Each module in the hospital management system is created to target a particular area of hospital operations. Patient registration, appointment scheduling, electronic medical records, and pharmacy are some of these modules. Patient registration, appointment scheduling, electronic medical records, pharmacy administration, laboratory management, invoicing, and inventory management are some of the modules that fall under this category. The technology offers administrators a dashboard where they can view and measure the hospital's performance in real-time.

The capability to store and access patient data in real-time is one of the major advantages of a hospital management system. This data consists of test outcomes, treatment schedules, and other pertinent data as well as medical history. This enables medical professionals to make wise choices and give patients prompt, accurate care. To ensure that patients receive the best treatment possible, the system can also provide notifications and reminders for visits, prescription schedules, and other crucial events. The automation of administrative activities is a key advantage of a hospital management system.

LIMITATIONS

The hospital system is essential to the community's access to healthcare services. Although medical technology and healthcare procedures have advanced, the hospital system still has a number of constraints that lower the level of care they can offer. We will talk about some of the hospital system's drawbacks in this article. The lack of qualified medical personnel is one of the hospital system's major drawbacks. The need for healthcare services is increasing, but there are not enough doctors, nurses, and other medical personnel to fulfil the need. Due to the lack, patients must wait a long time for appointments and the current medical staff is under stress, which lowers the standard of service and causes burnout. The absence of resources, such as medical supplies and equipment, is another restriction. Medical equipment for hospitals can range from basic supplies like bandages to sophisticated devices like MRI scanners. These supplies and equipment can be expensive to buy, maintain, and upgrade, especially for smaller hospitals. Due to equipment shortages, hospitals may be forced to ration supplies or postpone required treatments, which can have an impact on the quality of care given to patients.

The hospital system also faces financial challenges that may hinder their capacity to deliver high-quality healthcare. In addition to having to cope with budget cuts from the government and insurance companies, hospitals must also deal with the rising prices of healthcare services like prescription drugs and medical equipment. This financial strain may result in staffing cuts, put off equipment upgrades, or even force certain hospitals to close. Patients might have to travel far to access healthcare services as a result, which can be difficult for people who live in rural or remote places. The management of patient flow and bed capacity is another difficulty for the hospital system. Because of this, patients may have to wait a long time to obtain care or be moved to other institutions. Hospitals are frequently at capacity. This problem is particularly difficult when there is a spike in demand, like during flu season or a pandemic. Treatment delays, longer wait times, and worse patient outcomes might result from a lack of beds and resources. The standard of treatment provided in hospitals can also be impacted by information silos and communication breakdowns. A lack of coordination or communication among healthcare personnel who work in separate departments or shifts may result in medical mistakes, delays, and gaps in patient treatment. Additionally, it may be challenging for medical personnel to obtain crucial data in a timely and coordinated manner because patient data may be kept in several systems or files.

A vital part of every healthcare system is the hospital system. It is in charge of giving patients with a range of illnesses, injuries, and problems medical care. Hospitals play a significant role in healthcare, but despite this, there are a number of obstacles that prevent them from providing high-quality care effectively. Inadequate finance is one of the system's biggest weaknesses. To maintain their facilities, machinery, and staff, hospitals need a lot of money. But a lot of hospitals, especially those in low-income areas, suffer with inadequate funding, which

restricts their ability to deliver quality care. This frequently leads to a lack of vital medical supplies, a lack of staff, and subpar conditions. Patients may experience lengthy wait times and be denied access to specialised medical care as a result of inadequate financing. In conclusion, there are a number of constraints on the hospital system that lower the level of care they can offer. These restrictions include a lack of qualified medical personnel, a lack of funding, problems with patient flow and bed capacity, and communication breakdowns. Healthcare professionals, hospital executives, and lawmakers must work together to address these issues.

METHODOLOGY

A hospital's many administrative and operational tasks are managed by a software programme called a hospital management system (HMS). An effective HMS must be developed using a technique that is clearly defined and guarantees that the system will suit the needs of the hospital and its stakeholders. The following is a process for creating a hospital management system:

1. **Gathering requirements:** Collecting requirements from the hospital's stakeholders is the first stage in designing an HMS. This entails determining the various responsibilities that individual users should have, the various functions that the system should carry out, the data that it should acquire and store, and so forth.
2. **System design:** Following the collection of the requirements, the system must be designed. This include drawing up a blueprint of the user interface, database structure, and system architecture.
3. **System implementation:** After the system design has been put in place, the system must be put into action. This entails creating the software, setting up the hardware, and fusing together all of the system's many parts.
4. **Testing:** The system must be tested after it has been put into place to make sure it functions as planned. This include developing test cases, running them, reporting and fixing any discovered flaws.
5. **Deployment:** The system must be deployed after it has been tested and any flaws have been fixed. This entails setting up the system on the hospital's servers and giving the users training.
6. **Maintenance and support:** The system needs to be maintained and supported after it is put to use. This include keeping an eye on how it functions, figuring out and fixing any problems that crop up, and offering assistance to users.

By using this process, hospitals may create powerful HMSs that boost patient care, increase operational effectiveness, and offer superior overall service to their stakeholders.

LITERATURE REVIEW

Two of the major issues that current hospital management systems must address are operational efficiency and wait times for various operations, departments, and patients. In order to address these issues with current systems, this paper proposes a framework for location and information management based on RFID (Radio Frequency ID) and wireless sensors, which enables real-time tracking of hospital assets, staff, and patients as they move through pre-established procedures as part of daily operations of the hospitals. Users of the system can assess existing operations and make the required adjustments to increase process efficiency and service levels. The system also provides visual simulation.

Numerous programmes that offer tracking systems and anti-theft features have recently been launched. These programmes do, however, have some functional restrictions. For instance, a smartphone application designed for patients that manages their vital statistics data and transmits medical information to healthcare providers is missing elements like cabin reservations and user-friendly hospital statistical data. Only Alzheimer's sufferers can use another smartphone application designed to help doctors track their patients' prescription regimens. Similar to this, a patient's own healthcare system for diabetes cannot get services from a specific doctor and can only push blood glucose readings to a Google sheet. All things considered, the suggested reference data model can assist in lowering the expenses associated with the initial planning, requirement gathering, and design phase of new HIS development projects. To create mobile applications that meet the requirements of users with various medical conditions and provide a wider variety of functionalities, additional research must be done in the interim.

Many company efforts are routinely abandoned as a result of a number of unknowable circumstances and the large costs connected with the preliminary planning, demand gathering, and design phases. Lack of subject matter expertise, understanding of multiple healthcare industry activities, and involvement of pertinent stakeholders may be responsible for the increasing costs in this phase. This issue is addressed by suggesting a reference data model as a generic starting point for any future Health Information System (HIS) development initiatives. By doing away with the need to investigate and evaluate the current situation in order to discover gaps and add-on needs, this model saves money. The hierarchical described approach allows the choice of complete or partial implementation depending on the demands.

MAIN BODY OF PAPER

The process of managing and organising the different tasks and operations of a hospital or healthcare facility is referred to as hospital management. In addition to guaranteeing the effective use of employees and resources, the main objective of hospital administration is to guarantee that patients receive high-quality care and treatment. The primary elements of hospital management and the main difficulties faced by hospital managers will be covered in this essay.

Strategic planning is one of the most important aspects of hospital management. Creating a long-term vision and plan for the hospital's future while considering elements like patient demands, personnel capabilities, and technological improvements is required for this. A carefully crafted strategic plan ought to steer the hospital's decision-making, give guidance for resource allocation, and aid to maintain the hospital's competitiveness in a rapidly evolving healthcare environment.

Financial management is a crucial component of hospital management. Hospitals are intricate organisations that need a lot of resources to run efficiently, including personnel, buildings, supplies, and equipment. Creating and implementing budgets, keeping tabs on expenses, finding ways to save costs, and maximising revenue streams are all essential components of effective financial management. The capacity of the hospital to offer patients with high-quality care while simultaneously preserving financial stability depends on having a reliable financial management system.

A crucial element of hospital management is human resource management. To provide treatment for patients, hospitals rely on a wide variety of professionals, including doctors, nurses, office workers, and support staff. Recruiting and retaining exceptional employees, offering ongoing training and development opportunities, ensuring employee safety and health, and managing performance are all components of effective human resource management. For staff retention and providing patients with high-quality care, a friendly and encouraging work atmosphere is crucial.

An additional crucial component of hospital management is quality control. To guarantee patient safety and satisfaction, hospitals must uphold high standards of care. This entails creating and putting into practise quality assurance programmes, keeping track of and analysing clinical results, and applying evidence-based practises. Continuous improvement, recognising problem areas, and putting out plans to raise the standard of care are all components of quality management.

The problems provided by the rapidly evolving healthcare ecosystem must also be addressed by hospital management. New technology, therapies, and care delivery models are being developed in the healthcare industry at an unprecedented rate. In order to stay on top of things, hospital managers must stay informed about these changes and be ready to adjust their practises swiftly. Hospital management must also handle difficult legal and compliance requirements, like HIPAA and other privacy.

In conclusion, hospital administration is a challenging area with many facets that calls for a variety of knowledge and abilities. Strategic planning, financial management, human resource management, quality management, and the capacity to negotiate the difficulties of a healthcare environment that is rapidly evolving are all necessary for effective hospital management.

Hospital managers should make sure that their organisations offer patients high-quality care while also maintaining financial stability and remaining competitive in the ever evolving healthcare industry by concentrating on five important areas.

CONCLUSION

The study addresses the many benefits and drawbacks of the Quality Management Systems (QMS) that are currently in use as determined by various organisational quality evaluation methods. It is advised to fully leverage established models from the design of managerial elements and framework while creating a QMS for hospitals in China. While the GHGA programme criteria represent particular requirements in Chinese culture, the JCI accreditation standards represent the global trend of healthcare quality issues. While the GHGA standards emphasise the public nature of hospitals, the JCI standards emphasise patient safety and patient orientation. Therefore, when developing the managerial components of a QMS, both standards should be taken into account. The ISO 9000-based QMS places a strong emphasis on systemic process improvement. The detailed processes along the patient pathway from admission to discharge can be designed using the process method in the ISO9000 based QMS. The QMSs in quality award programmes show thorough oversight of the entire system, which can shed light on the relationships and connections between various hospital tasks. The debate of these organisational quality evaluation methods both domestically and internationally prompts some initiatives to find a more secure and effective mechanism for managing the quality of healthcare. An alternative that should be looked into is the integration of various systems for creating a QMS of continuous quality improvement and self-assessment.

HMS has been developed using computers. The existing manual system's issues were resolved by the system. Since authentication is required to access the system, security is also increased. The system does not inform the pharmacist, though, when a medicine is about to expire. Additionally, divisions like security and assets are not represented in the design. Therefore, it will be interesting to conduct research in the future to create an HMS that can handle all hospital departments and warn the pharmacist of the medicine expiration date at a specific moment.

REFERENCES

- I. K. Cincar, "Hospital Management and Scheduling with Multi Agents Approach," 2020 International Conference on e-Health and Bioengineering (EHB), Iasi, Romania, 2020, pp. 1-4, doi: 10.1109/EHB50910.2020.9280281.
- II. Y. Hu, Q. Su and L. Xue, "Research on quality management system design for hospitals," 2014 11th International Conference on Service Systems and Service Management (ICSSSM), Beijing, China, 2014, pp. 1-5, doi: 10.1109/ICSSSM.2014.6943410.

- III. H. K. P. Daksith and U. Hewage, "Total Quality Management & Customer Satisfaction in Public Hospitals in Sri Lanka," 2020 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM), Singapore, Singapore, 2020, pp. 1246-1250, doi: 10.1109/IEEM45057.2020.9309778.
- IV. Tie Hong, Man Dong, Jing Zhao, Xiujuan Fu and Yadan Chen, "The application of information technology in the hospital pharmacy management based on HIS," 2012 International Symposium on Information Technologies in Medicine and Education, Hokkaido, Japan, 2012, pp. 604-607, doi: 10.1109/ITiME.2012.6291379.
- V. Imteaj and M. K. Hossain, "A smartphone based application to improve the health care system of Bangladesh," 2016 International Conference on Medical Engineering, Health Informatics and Technology (MediTec), Dhaka, Bangladesh, 2016, pp. 1-6, doi: 10.1109/MEDITEC.2016.7835358.