

Hospital Management System

Spoorti K¹ Srusti P² Srusti V³ Vishkha G⁴ Prof. Mallangouda⁵

^{1,2,3,4,5}Department Of Computer Science and Engineering
^{1,2,3,4,5}Sharanbasav University, Kalaburagi, Karnataka, India

Abstract — Hospital Management Systems have become essential for improving the efficiency and quality of healthcare services. Traditional hospital administration relies heavily on manual record-keeping, which often leads to data redundancy, delays, and human errors. This paper presents the design and development of a Hospital Management System (HMS) developed using Java Swing and MySQL. The system integrates various hospital functions such as patient registration, doctor management, appointment scheduling, laboratory management, prescription handling, billing, ward management, and staff administration into a single platform. The proposed system provides secure data storage, fast information retrieval, and efficient hospital resource management. Experimental evaluation demonstrates that the system significantly reduces paperwork, improves operational efficiency, and enhances patient service quality.

Keywords: Hospital Management System, Java Swing, MySQL, Healthcare Management, Database Management, Hospital Automation

I. INTRODUCTION

Healthcare institutions generate a large volume of information related to patients, doctors, appointments, prescriptions, billing, and medical records. Managing these records manually is time-consuming and susceptible to errors. Hospitals require an efficient and reliable information management system that can automate administrative and clinical operations.

A Hospital Management System (HMS) is an integrated software solution designed to streamline hospital workflows and improve healthcare service delivery. The proposed HMS automates various hospital activities including patient registration, doctor scheduling, appointment booking, laboratory management, billing operations, and record maintenance.

The system is developed using Java Swing for graphical user interface design and MySQL as the backend database. The objective is to provide a user-friendly, secure, and scalable solution for hospital administration.

II. LITERATURE REVIEW

Hospital Information Systems have evolved significantly with advancements in software engineering and database technologies. Several studies have highlighted the importance of digital healthcare systems in improving patient care and administrative efficiency.

Electronic Health Record (EHR) systems have enabled healthcare providers to maintain patient information digitally, reducing data loss and improving accessibility. Researchers have also developed integrated hospital systems capable of managing appointments, prescriptions, laboratory reports, and financial transactions.

Despite these developments, many healthcare institutions still face challenges related to data consistency, user management, and system integration. The proposed

Hospital Management System addresses these issues through a centralized database and modular architecture.

III. OBJECTIVES

The main objectives of the Hospital Management System are:

- To automate hospital management processes.
- To maintain accurate patient records.
- To simplify appointment scheduling.
- To improve billing efficiency.
- To reduce paperwork and manual errors.
- To provide secure and centralized data storage.

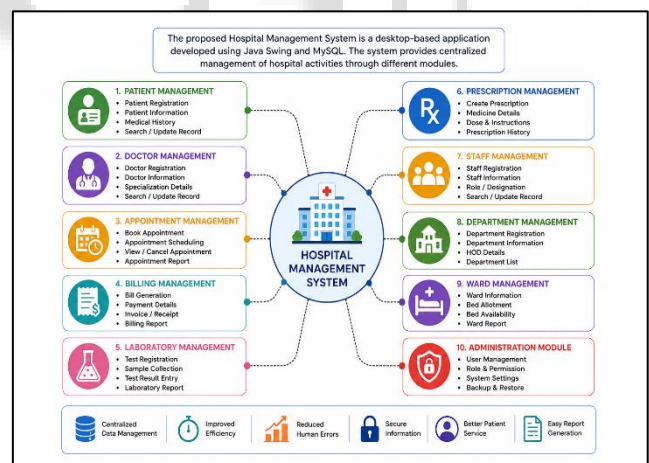
IV. EXISTING SYSTEM

In traditional hospital environments, records are maintained manually using paper-based files and registers. Such systems suffer from the following limitations:

- Large amount of paperwork.
- Data redundancy and inconsistency.
- Difficulty in retrieving patient information.
- Increased chances of human error.
- Poor coordination among departments.
- Limited data security.

These challenges create the need for an automated Hospital Management System.

V. PROPOSED SYSTEM



The proposed Hospital Management System is a desktop-based application developed using Java Swing and MySQL. The system provides centralized management of hospital activities through different modules.

A. Main Modules

- 1) Patient Management
- 2) Doctor Management
- 3) Appointment Management
- 4) Billing Management
- 5) Laboratory Management
- 6) Prescription Management
- 7) Staff Management

- 8) Department Management
- 9) Ward Management
- 10) Administration Module

VI. METHODOLOGY

The system follows the Software Development Life Cycle (SDLC) methodology.

A. Requirement Analysis

The requirements of hospital administration were collected and analyzed. Functional requirements included patient registration, appointment scheduling, doctor management, billing, laboratory services, and staff management.

B. System Design

The system architecture and database schema were designed using modular principles. Each hospital function was implemented as an independent module connected to a centralized database.

C. Development

Java Swing was used to design graphical user interfaces. JDBC was utilized for communication between the application and MySQL database. CRUD operations were implemented for managing records.

D. Testing

Each module was tested independently and then integrated for system-level testing. Functional testing ensured correctness of data processing and retrieval.

E. Deployment and Maintenance

The application was deployed on hospital computers and maintained through periodic database backups, software updates, and performance improvements.

F. System Flow

Patient Registration → Doctor Assignment → Appointment Scheduling → Diagnosis → Laboratory Tests → Prescription → Billing → Database Storage

VII. SYSTEM ARCHITECTURE

The architecture consists of three layers:

1) Presentation Layer

Provides graphical user interfaces developed using Java Swing.

2) Application Layer

Contains business logic and validation procedures.

3) Database Layer

Stores all hospital information in MySQL tables.

B. Architecture Diagram

Insert your system architecture figure here.

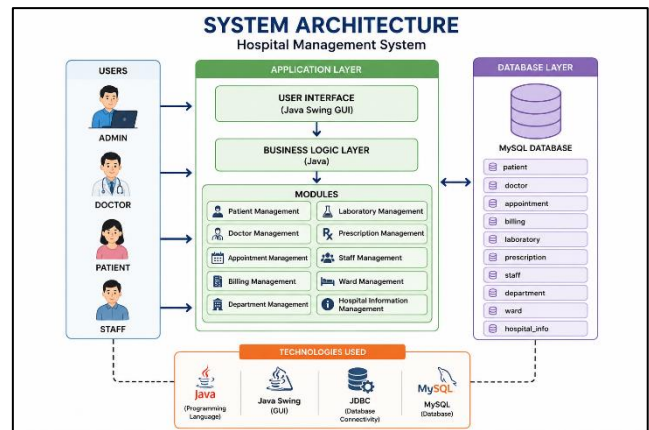


Fig. 1: Hospital Management System Architecture.

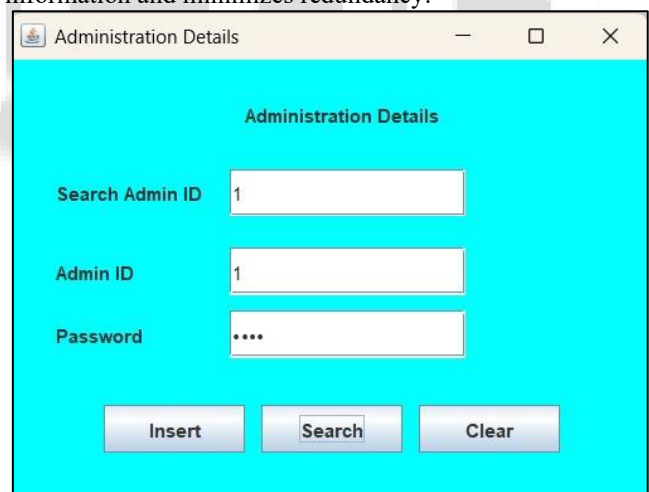
VIII. RESULTS & DISCUSSION

The developed system successfully automates hospital operations.

A. Observed Results

- Faster patient registration process.
- Improved appointment management.
- Accurate billing generation.
- Better record maintenance.
- Efficient laboratory management.
- Reduced manual workload.

The centralized database allows quick retrieval of information and minimizes redundancy.



REFERENCES

- [1] R. Sharma and P. Gupta, "Hospital Information Systems and Healthcare Management," *International Journal of Computer Applications*, vol. 182, no. 14, pp. 12–18, 2023.
- [2] S. Kumar, "Digital Transformation in Healthcare Systems," *International Journal of Advanced Research in Computer Science*, vol. 11, no. 2, pp. 45–51, 2022.
- [3] A. Patel and N. Shah, "Database Applications in Healthcare Management," *International Journal of Engineering Research and Technology*, vol. 10, no. 5, pp. 112–118, 2021.
- [4] J. Smith, "Electronic Medical Record Systems: Challenges and Opportunities," *IEEE Healthcare Conference Proceedings*, pp. 85–91, 2020.
- [5] World Health Organization, "Digital Health and Healthcare Information Systems," WHO Publications, 2024.

The image shows two software windows side-by-side. The top window is titled 'Patient Details' and contains the following fields: Search ID/Name (1), Patient ID (1), First Name (shri), Last Name (patil), Age (17), Gender (male), Phone (3333333331), Address (n r colony), ID Proof (aadhar), Status (not well), and Doctor ID (1). The bottom window is titled 'Doctor Details' and contains the following fields: Search ID/Name (1), Doctor ID (1), Doctor Name (srushti), Specialization (cardio), Qualification (mbbs), Availability (yes), Department (cardio), Phone (2222222221), and Email ID (srushti@gmail.com). Both windows have 'Insert', 'Search', and 'Clear' buttons at the bottom.

Fig. 2: Shows The Software Implementations