



# Paperless Hospital Record Management System (PL-HRMS)

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**Abstract**— The Paperless Hospital Record Management System (PL-HRMS) is a digital solution aimed at replacing traditional paper-based patient record systems in healthcare facilities. This system addresses key challenges such as data inaccessibility, record mismanagement, administrative inefficiencies, and lack of interoperability between healthcare providers. PL-HRMS leverages web technologies, including a React.js frontend, Node.js backend, and MySQL database, to provide secure, real-time access to patient data. It integrates role-based access control, data encryption, and audit trails to ensure privacy and compliance with standards like HIPAA and GDPR. Through modular design, it supports scalability, user engagement via a patient portal, and future integration with mobile apps and AI analytics. This paper presents the system's architecture, implementation strategy, and findings from a study on its potential impact. Results indicate improved workflow efficiency, reduced errors, and enhanced patient participation. The project highlights the importance of a sociotechnical approach, emphasizing user-centered design, staff training, and institutional support for successful adoption.

**Keywords**—PL-HRMS, Hospital, Patient Record Digitization, Data Security in Healthcare, React.js in Health Application, Data Security in Healthcare

## I. INTRODUCTION

Healthcare institutions worldwide continue to rely heavily on paper-based systems for managing patient records, despite the increasing availability and benefits of digital technologies. These traditional approaches are fraught with inefficiencies, including delayed access to information, frequent misplacement of records, increased administrative burden, and vulnerabilities in data security. Such limitations

not only compromise the quality of patient care but also hinder operational efficiency across medical departments.

The Paperless Hospital Record Management System (PLHRMS) is developed as a digital solution to address these challenges by replacing manual record-keeping with an integrated electronic platform. The system offers real-time access to patient data, supports role-based access control (RBAC), ensures data security through encryption protocols, and complies with regulatory standards such as HIPAA and GDPR. PLHRMS is designed to streamline workflows, reduce errors, and improve decision-making capabilities for healthcare professionals.

Built using modern web technologies—React.js for the frontend, Node.js and Express.js for the backend, and MySQL for data storage—the system supports scalability, interoperability, and future enhancements such as mobile access and AI-based analytics. This paper presents the architecture, implementation, and benefits of the PHRMS, along with findings from user evaluations in clinical environments. The goal is to demonstrate how a paperless approach can significantly transform healthcare delivery, improving both provider efficiency and patient engagement.

## II. EASE OF USE

### A. User-Centric Design

The Paperless Hospital Record Management System (PHRMS) has been developed with a strong focus on ease of

use. The system interface is built using React.js, offering a clean, responsive design that adapts seamlessly across devices. It ensures that users—including doctors, nurses, administrators, and patients—can interact with the platform intuitively, reducing the need for extensive training.

**B. Maintaining Workflow Efficiency and System Integrity**

All user roles within the PLHRMS are aligned with predefined access privileges through Role-Based Access Control (RBAC), ensuring that each user can perform only authorized actions. This structured design minimizes errors, enhances security, and maintains the integrity of medical workflows. The system architecture and user interface are intentionally kept simple and consistent, adhering to healthcare usability standards. Users are guided through essential functions such as patient data entry, report generation, and record access without requiring customization or external tools. These deliberate design choices support consistent performance across clinical environments and help maintain uniform system behavior during scaling and integration.

**III. PROPOSED METHODOLOGY**

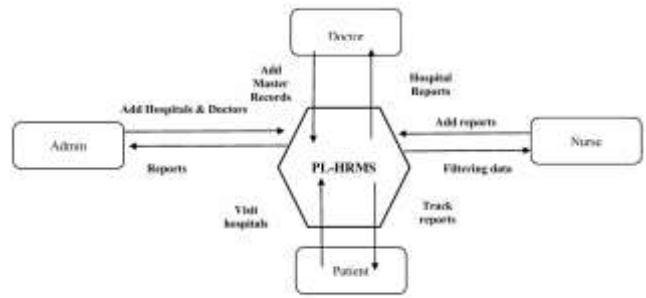
The Paperless Hospital Record Management System (PLHRMS) methodology involved gathering requirements through stakeholder interviews to identify challenges with paper-based records, such as inefficiency, delays, and security concerns. The project goals included digitizing patient records, improving workflow efficiency, enhancing data security, and empowering patients. The system was designed using a client-server architecture, with a React.js frontend for a responsive interface, a Node.js and Express.js backend for business logic, and a MySQL/PostgreSQL database for secure data storage. Key modules developed include patient management, healthcare staff portals, and a patient portal for record access and appointment management.

**A. Module Design**

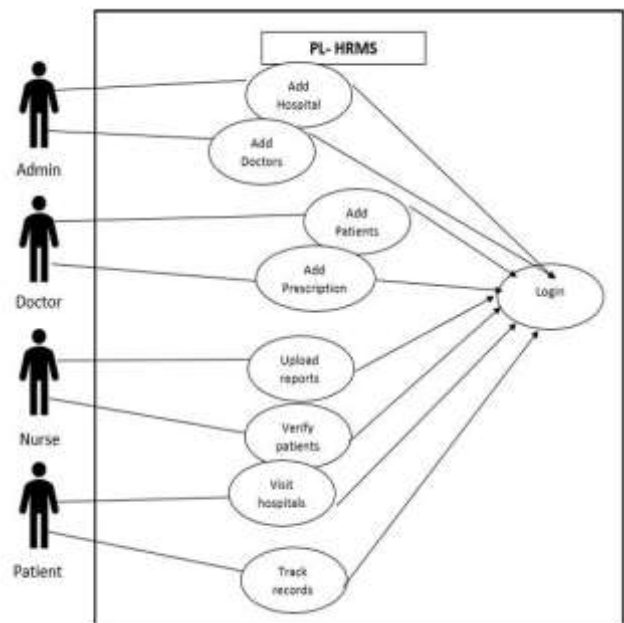
The Paperless Hospital Record Management System is structured into distinct modules to streamline functionality and user access.

- The Doctor and Nurse Portals provide healthcare professionals with tools to update diagnoses, generate prescriptions, and monitor patient progress in real-time.
- The Patient Portal allows patients to securely view their medical records, track appointments, and receive notifications.
- Admin Panel facilitates user management, role assignments, and system monitoring. These modules work cohesively within the client-server architecture to ensure seamless data flow and robust security.

**B. Data Flow Diagram**



**C. Use Case Diagram**

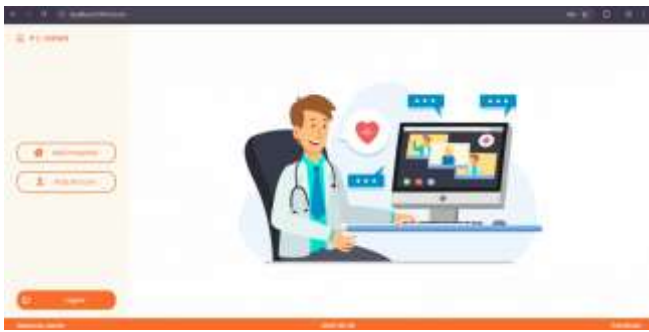


**IV. RESULT AND CONCLUSION**

- Login Page



- Admin Dashboard



• Doctor Dashboard



• Generating Patient Card



• Patient Profile



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REFERENCES

- [1] B. Buntin, M. Burke, M. Hoaglin, and D. Blumenthal, "The benefits of health information technology: A review of the recent literature shows predominantly positive results," *Health Affairs*, vol. 30, no. 3, pp. 464–471, Mar. 2011.
- [2] Y. Li, J. Tan, and R. Wang, "The role of information and communication technology in smart hospitals," *Health Informatics Journal*, vol. 25, no. 3, pp. 1058–1070, Sep. 2019.
- [3] T. Kim, J. Yoo, and S. Kim, "The digital hospital: Transitioning from paper to electronic records," *International Journal of Medical Informatics*, vol. 72, pp. 113–121, 2003.
- [4] M. I. Harrison, K. Koppel, and S. Bar-Lev, "Unintended consequences of information technologies in health care—An interactive sociotechnical analysis," *Journal of the American Medical Informatics Association*, vol. 14, no. 5, pp. 542–549, Sep. 2007.
- [5] C. Shan, H. Zheng, and Y. Luo, "Impact of electronic health record systems on workflow efficiency and patient care: A review," *Journal of Healthcare Engineering*, vol. 2016, Article ID 1830953, pp. 1–8, 2016.
- [6] M. Garcia, L. Lopez, and A. Torres, "Patient-centered care and the use of paperless medical record systems," *BMC Health Services Research*, vol. 17, no. 1, pp. 1–9, Jan. 2017.