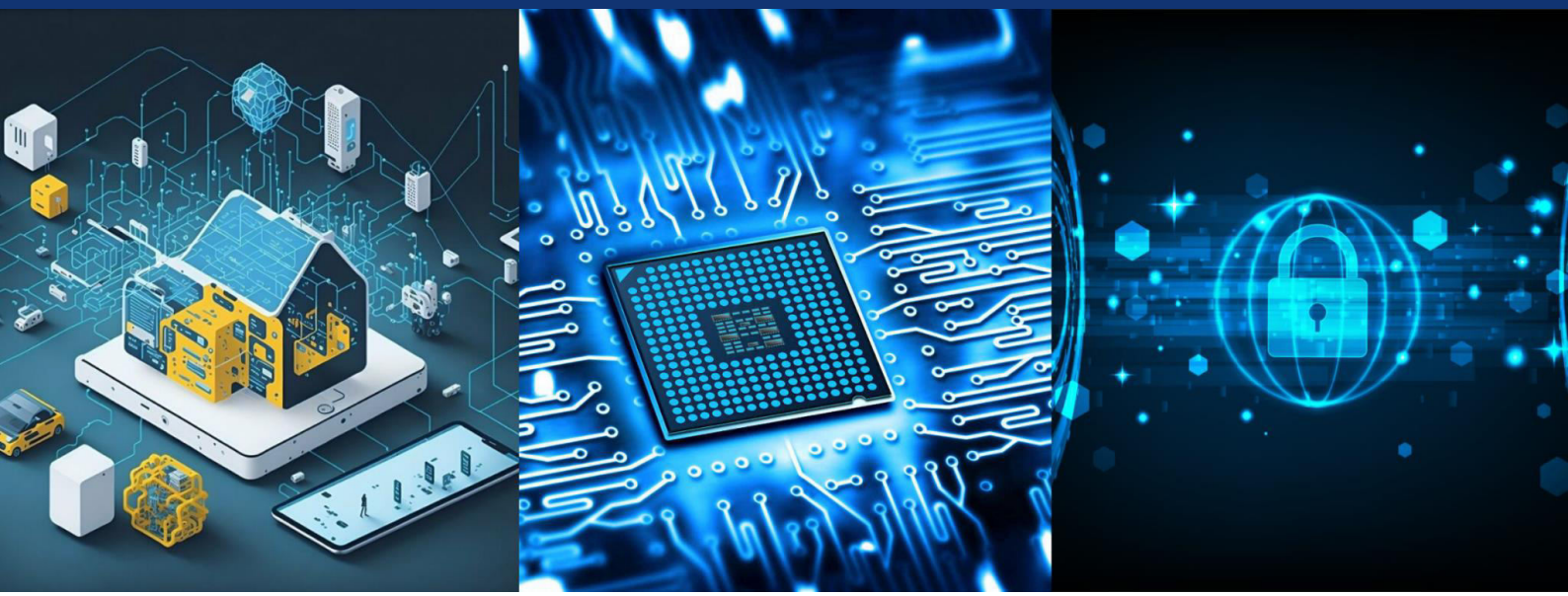
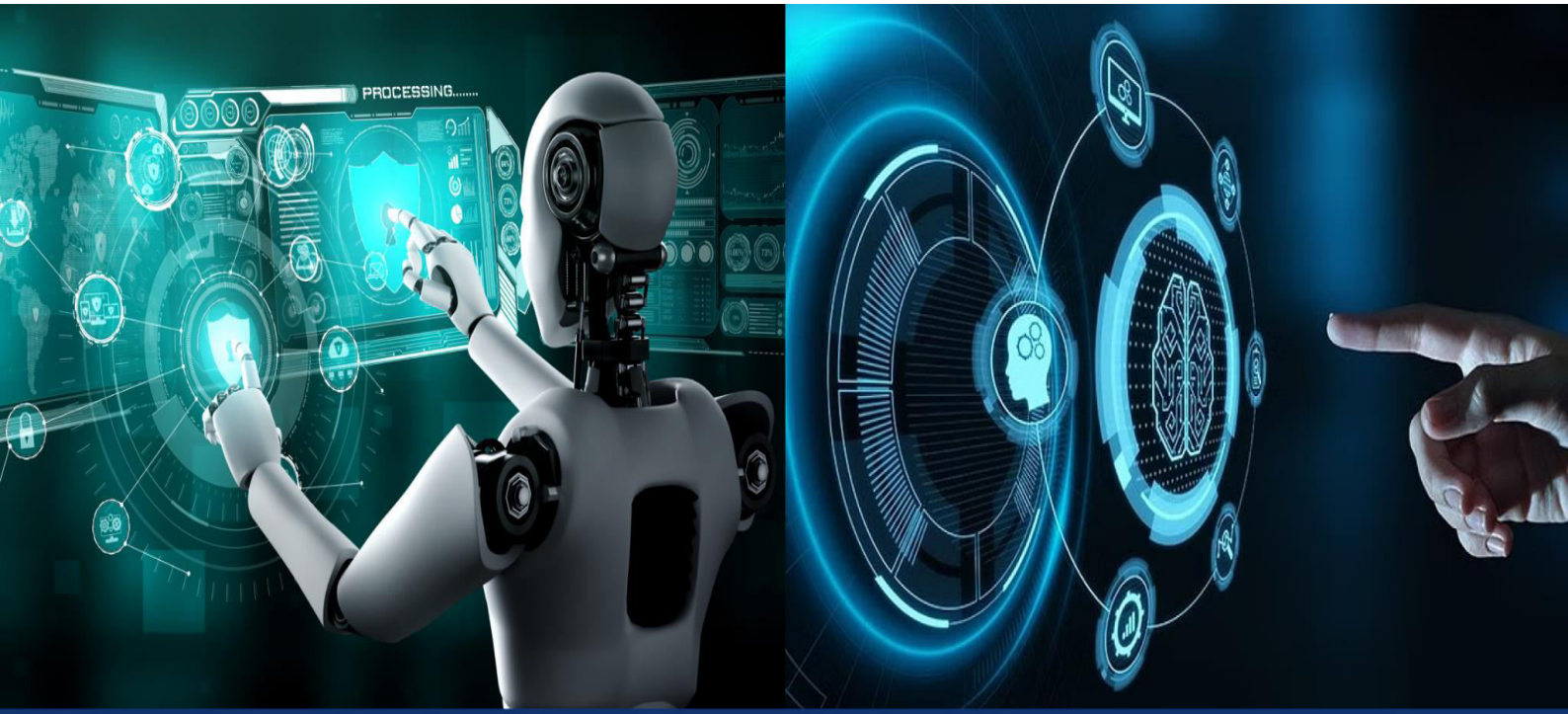
ISSN(O): 2320-9801
ISSN(P): 2320-9798



International Journal of Innovative Research in Computer and Communication Engineering

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 8.771 **Volume 14, Issue 4, April 2026**

© 2026 IJIRCCE | Volume 14, Issue 4, April 2026| DOI: 10.15680/IJIRCCE.2026.1404125

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 8.625| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

Universal Health Record System Using QR Code: A Digital Solution for Secure and Instant Healthcare Access

Samruddhi Ashutosh Lad, Atharva Ashutosh Lad, Harshada Samadhan Patil,

Vishal Digambar Sonawane

Department of Electronics and Computer, Shreeyash Collage of Engineering and Technology, CHH. SambhajiNagar, India

ABSTRACT: Efficient management of patient medical records is a major challenge in modern healthcare systems. Patients often visit multiple hospitals, resulting in fragmented and inaccessible medical histories. This paper presents the design and development of a Universal Health Record (UHR) System using QR Code technology to provide secure, fast, and universal access to patient data. Each patient is assigned a unique QR code that links to their digital health records stored in a cloud database. Healthcare providers can scan the QR code to instantly retrieve medical history, improving diagnosis accuracy and emergency response. The proposed system is simple, cost-effective, and suitable for both urban and rural healthcare environments.

KEYWORDS: Universal Health Record, QR Code, Healthcare System, Digital Health, Cloud Storage, Patient Data Management

I. INTRODUCTION

In today's healthcare environment, patients often receive treatment from multiple hospitals, clinics, and diagnostic centers. This results in fragmented and scattered medical records, making it difficult for healthcare providers to access a complete and accurate patient history at the time of treatment. Due to the lack of a unified system, doctors may face delays in diagnosis, repetition of medical tests, and increased chances of medical errors, which can negatively impact patient care and increase overall healthcare costs.With the rapid advancement of digital technologies, there is a growing need for a centralized and efficient healthcare information system that enables seamless access to patient data anytime and anywhere. A unified digital platform can significantly improve the quality of healthcare services by ensuring that accurate and up-to-date patient information is readily available to authorized medical professionals. This not only enhances decision-making but also improves coordination among different healthcare providers.

The proposed Universal Health Record (UHR) system addresses these challenges by providing a secure, cloud-based solution for storing and managing patient medical records. In this system, each patient is assigned a unique Quick Response (QR) code that acts as a digital identifier linked to their health records. By simply scanning the QR code using a mobile device or scanner, doctors and healthcare staff can instantly retrieve patient information such as medical history, prescriptions, test reports, and allergies.Furthermore, the use of QR code technology ensures fast, reliable, and cost-effective access to medical data, making the system suitable for both urban and rural healthcare environments.

II. LITERATURE REVIEW

Various digital healthcare systems have been developed to manage patient data effectively. **Electronic Health Record (EHR)** systems allow hospitals to maintain digital records and reduce paperwork; however, they are generally limited to a single organization, making data sharing between hospitals difficult.

Cloud-based healthcare systems improve accessibility by allowing data to be stored and accessed from multiple locations. Despite this advantage, they often face challenges related to security and lack quick identification methods during emergencies.

© 2026 IJIRCCE | Volume 14, Issue 4, April 2026| DOI: 10.15680/IJIRCCE.2026.1404125

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 8.625| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

QR code-based systems have been used for patient identification due to their simplicity and low cost. However, most existing systems do not fully integrate QR codes with complete health record management.

The proposed system combines **QR code technology with cloud storage** to provide a fast, secure, and universally accessible solution for managing patient health records.

III. RESEARCH METHODOLOGY

3.1 System Overview

The Universal Health Record system is designed as a web/mobile-based application that stores patient data securely and allows instant retrieval using QR codes.

3.2 Software Components

- Frontend: HTML, CSS, JavaScript / React Native
- Backend: Firebase / Node.js
- Database: Cloud Firestore / MySQL
- QR Code Generator & Scanner

3.3 Working Methodology

- The system follows a simple process:

1. Patient registers in the system
2. Unique QR code is generated
3. Medical records are stored in cloud database
4. Doctor scans QR code
5. Patient data is retrieved instantly

3.4 System Architecture

- The system architecture shows how patient data flows from registration to storage and retrieval.

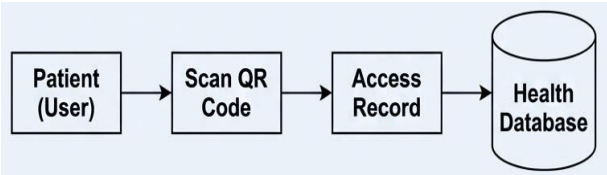


Fig 3.4: System Architecture of UHR System

3.5Workflow Diagram

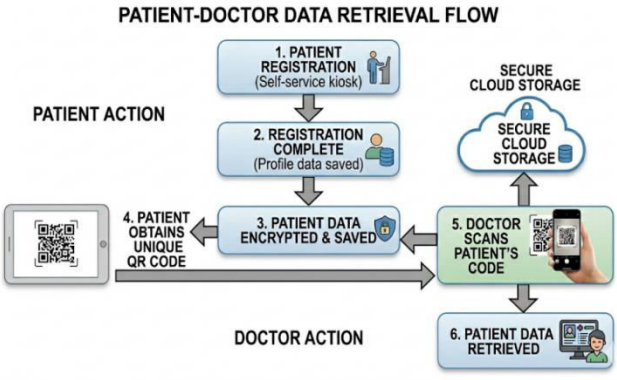


Fig 3.5: Workflow of UHR System

© 2026 IJIRCCE | Volume 14, Issue 4, April 2026| DOI: 10.15680/IJIRCCE.2026.1404125

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 8.625| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

3.5 Data Flow Diagram

- The Data Flow Diagram (DFD) represents how data moves within the Universal Health Record (UHR) System.
- It shows the interaction between different components such as patient, system, database, and healthcare provider.
- The process begins when the patient enters personal and medical details during registration.
- The system processes and stores this data securely in the cloud database.
- A unique QR code is generated for each patient, which is linked to their stored records.
- The doctor scans the QR code to access patient information.
- The system retrieves the data from the database and displays it for viewing or updating.
- The DFD helps in understanding data movement, system workflow, and interaction between entities.

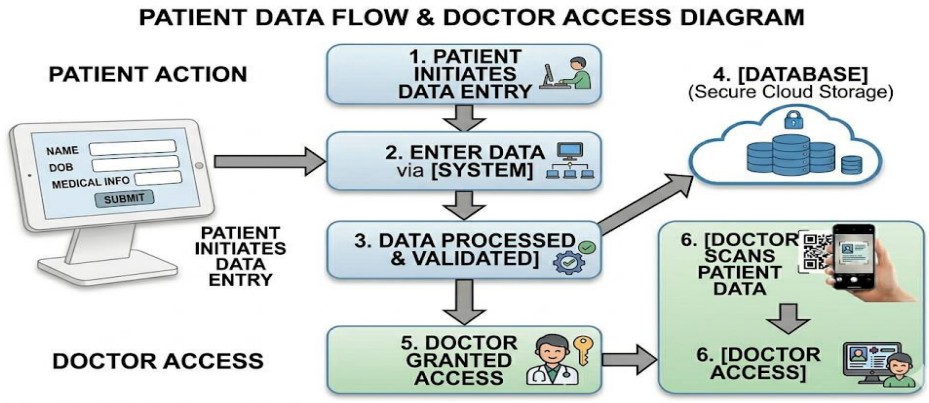


Fig 3.6: Data Flow Diagram of UHR System

IV. RESULTS AND DISCUSSION

- The system was tested under different scenarios such as patient registration, QR scanning, and data retrieval.

Parameter	Observation / Result
QR Code Generation	Successful
Data Storage	Secure and Reliable
Data Retrieval	Fast and Accurate
User Interface	Easy to Use
System Performance	Stable

Table 4.1: System Performance Evaluation

- The results show that the system performs efficiently and allows quick access to patient records. It reduces manual effort and improves healthcare service quality.

V. APPLICATIONS

- **EmergencyHealthcare Access:**

Enables doctors to quickly access patient details such as blood group, allergies, and medical history during emergencies.

- **Hospital Patient Management:**

Helps hospitals efficiently store, update, and manage patient records in a centralized system.

- **Medical History Tracking:**

Allows continuous tracking of patient health records, including previous diagnoses, prescriptions, and reports.

- **Rural Healthcare Systems:**

Provides easy access to patient data in remote areas where maintaining physical records is difficult.

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 8.625| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

- **Digital Health Identification:**

Acts as a unique digital identity for patients using QR codes, ensuring quick and secure identification across healthcare centers.

VI. CONCLUSION

This project presents the design and implementation of a Universal Health Record (UHR) System using QR Code technology, aimed at improving the way patient medical data is stored, accessed, and managed. The proposed system provides a centralized digital platform where patient health records are securely maintained and can be retrieved instantly using a unique QR code assigned to each individual. This ensures quick access to accurate patient information, helping healthcare providers make better and faster decisions.

One of the major advantages of this system is its ability to eliminate traditional paper-based records, which are often prone to loss, damage, and mismanagement. By digitizing medical information and linking it to QR codes, the system ensures that patient data is always available, up-to-date, and easy to access. This significantly reduces administrative workload, avoids duplication of medical tests, and improves overall hospital efficiency. Additionally, the system enhances emergency response by enabling instant retrieval of critical patient details.

Overall, the proposed solution offers a simple, secure, and efficient approach to modern healthcare data management, contributing to improved patient care and better healthcare services.

VII. FUTURE SCOPE

The proposed Universal Health Record (UHR) System using QR Code can be further enhanced by integrating advanced technologies and additional features to improve its efficiency, security, and usability:

- **AI-based Health Prediction**:

Artificial Intelligence and Machine Learning techniques can be integrated to analyze patient medical history, symptoms, and reports. This can help in predicting potential diseases at an early stage, suggesting preventive measures, and supporting doctors in accurate decision-making.

- **Integration with Government Systems**:

The system can be connected with national healthcare platforms and digital health ID systems to enable seamless sharing of patient data across public and private hospitals. This will ensure better coordination, standardized records, and improved healthcare accessibility at a large scale.

- **Biometric Authentication**:

Advanced authentication methods such as fingerprint scanning or facial recognition can be added to ensure that only authorized individuals can access sensitive patient information. This will significantly enhance data privacy and prevent unauthorized access.

- **Blockchain-based Security**:

Blockchain technology can be used to store medical records in a decentralized and tamper-proof manner. This ensures data integrity, transparency, and security, reducing the risk of data manipulation and cyber threats.

- **Offline QR Code Access:**

The system can be improved to allow storage of essential patient information such as blood group, allergies, and emergency contacts directly within the QR code or local storage. This ensures accessibility of critical data even in areas with poor or no internet connectivity.

- **Integration with Wearable Devices:**

The system can be connected with wearable health devices such as fitness bands and smartwatches to collect real-time health data like heart rate, activity levels, and sleep patterns. This will enable continuous health monitoring and better patient care.

- **Mobile Application Enhancement:**

A more advanced and user-friendly mobile application can be developed with improved interface design, notifications, and easy navigation for both patients and healthcare providers.

- **Multi-language Support:**

Adding support for multiple regional languages will make the system more accessible and user-friendly, especially for people in rural and non-English speaking areas.

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 8.625| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

VIII. ACKNOWLEDGEMENT

We would like to express our sincere gratitude to the **Department of Electronics and Computer Engineering, Shreeyash College of Engineering and Technology, Chh. Sambhajinagar, India** for providing the necessary infrastructure, facilities, and continuous support required for the successful completion of this project. We are deeply thankful to our project guide, **Prof. Shaila Kharde**, for her valuable guidance, insightful suggestions, and constant encouragement throughout the development of this work. Her expertise and support played a crucial role in shaping the direction and quality of this project.

We also extend our sincere thanks to the Head of the Department, **Dr. C. Srinivasa Murthy**, for his support and encouragement. We express our appreciation to all the faculty members of the department for their guidance and for providing a strong academic foundation. We would also like to thank our friends and classmates for their cooperation and assistance during the implementation and testing phases. Finally, we express our heartfelt gratitude to our family members for their unwavering support, motivation, and encouragement throughout this academic journey.

REFERENCES

[1] World Health Organization (WHO), *Digital Health: Global Strategy on Digital Health 2020–2025*, WHO Press, 2021.
[2] Google, *Firebase Documentation*, Available: https://firebase.google.com/docs
[3] A. Kumar and S. Gupta, "QR Code Based Patient Identification System in Healthcare," *International Journal of Computer Applications*, vol. 180, no. 45, pp. 20–25, 2018.
[4] J. Smith and R. Patel, "Electronic Health Record Systems: A Comprehensive Study," *International Journal of Healthcare Technology*, vol. 5, no. 2, pp. 45–52, 2019.
[5] M. Singh and P. Verma, "Cloud Computing in Healthcare: Opportunities and Challenges," *International Journal of Advanced Research in Computer Science*, vol. 9, no. 3, pp. 120–125, 2020.
[6] S. Sharma and R. Mehta, "Secure Data Sharing in Healthcare Using Cloud Technology," *International Journal of Engineering Research & Technology (IJERT)*, vol. 8, no. 6, pp. 234–239, 2019.
[7] N. Jain and K. Shah, "QR Code Based Smart Health Card System," *International Journal of Innovative Research in Computer Science*, vol. 7, no. 4, pp. 55–60, 2021.
[8] Microsoft, *Cloud Computing for Healthcare*, Available: https://azure.microsoft.com

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

INNO SPACE SJIF Scientific Journal Impact Factor

doi cross ref

निस्केयर NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

www.ijircce.com

Scan to save the contact details