e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:06/Issue:11/November-2024 Impact Factor- 8.187 www.irjmets.com

A QR CODE-BASED HEALTH CARE CARD SYSTEM

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ABSTRACT

Since the healthcare system is one of the main issues facing developing countries, technological advancement has become increasingly important in today's world. In unforeseen situations, such as accidents, and when medical professionals determine that a patient needs immediate care in difficult situations, smart card systems are crucial. Upon birth, a dossier is maintained that includes information such as the baby's blood type, vaccination dates, allergic reaction challenges, and numerous other important details. Today, healthcare technology is becoming more and more significant since the medical system is one of the main issues in emerging economies. The rising costs of social insurance have led to an increase in requests for methods to lower the cost of medical services. One of the few participants of the two sides arguing for the best practice for minimizing costs in the context of human care architecture is the need to coordinate the most recent developments in the capacity and exchange of therapeutic data.

Keywords: MySQL, QR Code, E-Health Card.

I. INTRODUCTION

Over the past ten years, smartphones and computers have advanced significantly, revolutionizing a number of industries, most notably healthcare. For instance, the Quick Response (QR) code-based e-healthcare identification framework provides a complete and effective substitute for patient data storage and expediting medical procedures. An effective electronic health care card system with modules for administrators, super admins, doctors, patients, chemists, laboratories, nurses, and receptionists is the main goal of the endeavor. The electronic healthcare card system makes use of Quick Response (QR) codes, which are multipurpose barcodes with a great capacity for data storage. These codes offer instant access to pertinent information and are easy to read with a cellphone or other specialized scanning devices. The system aims to enhance the efficacy, dependability, and integrity of health care services by transforming medical records and fostering better interpersonal relationships. The administrator module is in charge of managing all facets of system administration, including user roles, authorizations, and database upkeep. The Super admin module keeps a careful eye on how the system is operating and guarantees data confidentiality and consistency. With the help of the doctor component, medical practitioners can get data about patients, medical histories, and treatment plans, enabling accurate diagnosis.

II. METHODOLOGY

In conducting a thorough and impartial literature review, this research considers a selection of ten studies from reputable journals and conferences. Each study contributes unique perspectives to the evaluation of this work.

In [1], the author introduces a cloud infrastructure-based approach utilizing an RFID reader to access and manage patient medical data. This framework enables both medical staff and patients to securely retrieve information, providing a full-spectrum hospital administration solution. Researchers developed an organized model for managing health-related information.

In [2], the author explores innovations, challenges, and opportunities in an Internet of Things (IoT)-connected healthcare network. The technology, based on IoT design, gathers data from wearable sensors on patients. Researchers highlight remote and short-range data transfer solutions, cloud-based infrastructure, and devices that monitor various medical requirements.

In [3], an electronic card with a centralized healthcare access point was developed, forming a portable, machine-based wellness tracking system. Even if a smart card is erased, interactions with the computer's processor can still be tracked, allowing for medical verification via scanning.

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In [4], a biometric-hash-based authentication system is proposed to enhance security. Addressing the vulnerabilities of the Das et al. system, the author demonstrates susceptibility to hacking attempts in login procedures. This framework uses retinal templates to provide an additional security layer, effectively authenticating users.

In [5], the concept of Tell-us Cards is introduced to facilitate patient engagement in healthcare services. Patients use the Tell-us Card—a postcard-sized document—to verbally communicate goals for the following day or before discharge.

In [6], an environmentally friendly healthcare management platform based on RFID technology is presented. This model ensures safe, private management of patient information through radio frequency identification, commonly used in industries like libraries and supply chains. The RFID-based framework demonstrates promising applications for healthcare information systems.

In [7], the author examines the potential of digital currencies in healthcare, supported by blockchain technology. The blockchain allows for the secure, transparent recording of interactions across multiple devices, enhancing data security through immutability. Both public and private blockchain frameworks are evaluated for healthcare, offering rapid data validation and improved security.

In [8], a smartphone-based healthcare card system is proposed to enhance data collection, analysis, storage, and application. This system leverages modern technology to streamline the management of health data, especially useful in developing regions.

In [9], lightweight encryption algorithms are utilized for the development of smart cards, addressing security concerns in electronic card applications. Researchers analyze various studies on verification and data encryption techniques for smart card systems.

In [10], a Portable NFC Smartphone Healthcare Information Architecture is proposed, employing the S-MAPLE (Secure Mobile Access Point with Protected Element) model. This NFC-enabled health card emphasizes a secure architecture, ensuring data integrity within a mobile framework.

III. MODELING AND ANALYSIS

Aim of this project's research is to identify challenges faced by medical professionals in quickly and efficiently accessing patient information during emergencies, especially when patients are in critical condition. The objective is to develop and assess an e-healthcare card solution utilizing quick response (QR) codes. This solution allows healthcare providers to rapidly retrieve patient data by scanning the QR code on the card, thereby expediting the process and enhancing patient care in urgent situations.

Research Objective

The main goal is to assess the potential advantages and limitations of using QR codes for patient information retrieval and to examine the method's impact on healthcare delivery. The system's research objectives to achieve this goal include:

Feasibility Assessment

Effectiveness Evaluation

User Acceptance and Satisfaction

Security and Privacy Analysis

Authentication Function

A hash function is an arithmetic operation that takes an input (or "message") and generates a fixed-length output, commonly called a hash or hash code.

Step 1: Input Message - The hash function begins with an input message, which can vary in length.

Step 2: Hash Function - An algorithm is applied to the input message, performing logical, bitwise, and modular arithmetic operations to produce the hash.

Step 3: Hash Value - The output is a fixed-length string, known as the hash value or hash code, typically represented as an alphanumeric string or binary number.

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System Architecture

The QR-based e-Healthcare Card System is an innovative platform that leverages QR code technology to streamline and accelerate the delivery of medical services. This architecture overview highlights the main features and components of the QR-based e-Healthcare Identification Platform.

System Architecture

The system consists of several key modules, outlined below:

Super Admin: Manages overall system access and oversees administrative functionalities.

Admin: Handles daily administrative tasks and supervises other system modules.

Doctor: Accesses patient information through QR codes and manages patient care.

Patient: Manages personal information and interacts with healthcare providers.

Schedule: Organizes and manages scheduling for patient appointments.

Appointment: Manages booking and tracking of appointments for patients and doctors.

Human Resources: Oversees personnel management and staffing within the healthcare facility.

Medicine: Manages medical inventory, including tracking and dispensing of medications.

Pharmacy Module: Coordinates with the medicine module to ensure proper dispensation of prescriptions.

Prescription: Generates and maintains patient prescriptions.

Lab Tests: Manages ordering, tracking, and results of diagnostic tests.

Features of Digital India: E-Health Card:

1. Mobile Compatibility [Responsive]
2. Easy and fast retrieval of information.
3. Robust database backend
4. Well-designed reports
5. Reduced misidentification

IV. RESULTS AND DISCUSSION

In this paper, we examined the functionality and operational aspects of the e-Healthcare Card system, discussing methods for implementing this technology. The entire e-health card system can be hosted on a centralized platform, allowing for streamlined access to patient information by authorized medical personnel. The figures below depict the full implementation of this system, demonstrating how it efficiently manages patient data and integrates with various healthcare modules.

The hospital administrators and managers are the intended audience for the admin module. Departments, staff, amenities, and resources were only a few of the variables that administrators can control in a medical facility. In addition to allocating funds to various departments and tracking departmental performance, they can create, edit, and delete departments. Administrators may arrange hours for personnel, assign roles and duties, and manage staff accounts. They can also use reporting and analytics tools to evaluate the performance of the hospital as a whole.

The former one is general security features that is visible to all, while the latter one is system level security which covers software, hardware, and network level security. To resolve these security issues, the security risks must be identified first in this regard. In the proposed Health card system, following risks have been identified and analyzed.

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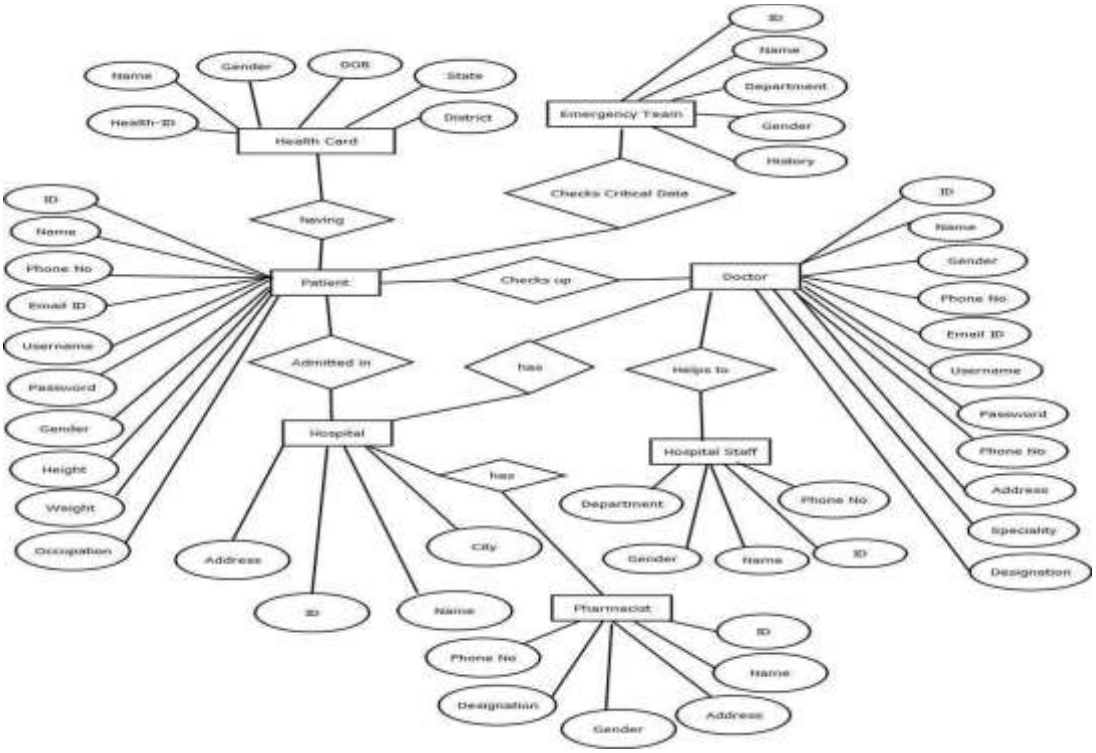

V. RESULT

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VI. CONCLUSION

The implementation of a Health ID represents a significant advancement in the digitization of healthcare. It serves as a secure, efficient, and easily accessible method for managing and accessing health records. By linking the Health ID with Aadhaar or a mobile number, individuals can effortlessly consolidate their medical history, making it readily available whenever needed. This system not only simplifies the process of retrieving lab reports, prescriptions, and diagnoses but also enhances the overall healthcare experience by ensuring that the data is securely shared between verified healthcare providers.

The use of a Health ID addresses several key challenges in healthcare, including accessibility, privacy, and data management. It ensures that patient information is stored in a centralized and organized manner, reducing the chances of lost or misplaced records. Additionally, the ability to access health data digitally increases convenience, especially in emergencies or for patients who require frequent medical attention.

As the system integrates with various healthcare providers, it opens the door to more efficient communication, faster diagnoses, and better-informed treatment decisions. Furthermore, the emphasis on verified providers ensures that data privacy and security are upheld, protecting sensitive health information from unauthorized access.

Ultimately, the Health ID system promises to revolutionize healthcare delivery by improving data accessibility, accuracy, and security, paving the way for a more connected, transparent, and patient-centered healthcare system.

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