Vivekanand Education Society's Institute of Technology

Department of Computer Engineering

Group No.: 18

Date:- October 11, 2024

Project Synopsis (2024-25) - Sem VII

MEDIACCESS CARD

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Sustainable Goal

Good Health and Well Being

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CHAPTER 01: INTRODUCTION

1.1 Introduction to the Project

The MediAccess Card project aims to revolutionize patient data management in healthcare settings through the integration of Near Field Communication (NFC) technology. This innovative solution enables healthcare professionals to access and update patient records efficiently, promoting seamless information exchange. By providing a secure and portable means for patients to manage their medical information, the MediAccess Card enhances the overall quality of healthcare delivery.

1.2 Motivation for the Project

The increasing complexity of healthcare data management and the growing demand for real-time access to patient information have underscored the need for an efficient solution. Traditional systems often rely on paper records and manual data entry, leading to delays, errors, and compromised patient care. The MediAccess Card seeks to address these challenges by utilizing NFC technology, enabling instant access to critical medical information. The motivation stems from a desire to improve healthcare outcomes, enhance patient engagement, and streamline administrative processes.

1.3 Drawbacks of the Existing System

Existing healthcare data management systems typically face several drawbacks:

- Inefficiency: Reliance on manual processes leads to delays in accessing and updating patient information.
- Errors: Human error in data entry can result in inaccurate medical records, potentially jeopardizing patient safety.
- Fragmentation: Patient data is often scattered across different systems, making it difficult for healthcare professionals to obtain a comprehensive view of a patient's history.
- Limited Accessibility: Many systems do not provide real-time access to data, hindering timely decision-making in clinical settings.
- Lack of Patient Engagement: Traditional systems often do not empower patients to access their own health information easily.

1.4 Problem Definition

The primary problem addressed by the MediAccess Card project is the inefficiency and inaccessibility of patient data in current healthcare systems. Healthcare professionals require immediate access to accurate patient information to make informed decisions, while patients need a straightforward way to manage and understand their medical records. The lack of a unified, secure, and user-friendly solution hampers the delivery of quality healthcare and compromises patient engagement.

1.5 Relevance of the Project

The relevance of the MediAccess Card project is underscored by the ongoing shift towards digital health solutions. As healthcare providers

increasingly adopt technology to enhance patient care, the demand for secure and efficient data management tools continues to grow. The MediAccess Card aligns with trends in telehealth, patient-centered care, and the increasing importance of data privacy and security in healthcare. By integrating NFC technology, the project not only improves operational efficiency but also fosters better communication between patients and providers, ultimately leading to improved health outcomes.

1.6 Methodology Used

The methodology for the MediAccess Card project follows a structured approach to ensure thorough development and implementation:

1. Research and Analysis: Conduct a comprehensive analysis of existing healthcare systems and identify user needs through surveys and interviews with healthcare professionals and patients.
2. System Design: Develop a detailed architecture for the MediAccess Card, incorporating NFC technology, a mobile application, and a backend server for data management.
3. Development: Utilize agile development practices to build the system iteratively, allowing for continuous feedback and improvement.
4. Testing: Implement rigorous testing protocols, including functional, performance, and security testing, to ensure the system meets all requirements.

5. Deployment: Roll out the MediAccess Card in a controlled environment to gather user feedback and address any issues before full-scale deployment.
6. Evaluation: Post-deployment, assess the system’s impact on patient data management and gather feedback for future enhancements.

CHAPTER 02: LITERATURE SURVEY

CHAPTER 03: REQUIREMENTS OF PROPOSED SYSTEM

3.1 Functional Requirements

1. User Registration:
    - Users (patients and healthcare professionals) can register and create accounts.
    - Patients can link their MediAccess Card to their hospital records.
2. NFC Integration:
    - The system must support NFC technology for data retrieval.
    - Users can access patient records by tapping the MediAccess Card on compatible devices.
3. Data Management:
    - Healthcare professionals can view, update, and manage patient records securely.
    - Patients can view their medical history and treatment plans.
4. Real-Time Synchronization:
    - The system must synchronize data in real-time between the MediAccess Card and hospital servers.

    - Any updates made in the hospital's database should reflect immediately on the card.
5. Security:
    - Implement encryption for data stored on the MediAccess Card.
    - Ensure secure access protocols for healthcare professionals.
6. User Interface:
    - Provide a user-friendly interface for both patients and healthcare professionals.
    - Ensure accessibility features for users with disabilities.
7. Notifications:
    - Send notifications to patients for appointments, reminders, and updates on their medical records.

3.2 Non-Functional Requirements

- Performance:
    - The system should support at least 100 simultaneous users without performance degradation.
    - NFC data retrieval should occur within 2 seconds.
- Scalability:
    - The system must be scalable to accommodate future enhancements, such as integrating additional medical facilities.
- Usability:
    - The interface should be intuitive and easy to navigate for users of all ages.
- Reliability:
    - The system should have a 99.9% uptime to ensure continuous access to patient records.
- Compliance:
    - Adhere to healthcare regulations and standards (e.g., HIPAA) for patient data protection and privacy.

3.3 Constraints

1. Technology Limitations:
    - NFC technology may not be universally supported by all devices.
    - Dependence on internet connectivity for real-time synchronization.
2. Budget Constraints:
    - Limited budget for development and deployment of NFC-enabled cards.
3. Regulatory Compliance:
    - Must comply with healthcare regulations, which may limit design choices.
4. User Adoption:
    - Potential resistance from healthcare professionals accustomed to traditional systems.

3.4 Hardware & Software Requirements

Hardware Requirements:

- NFC-enabled devices (smartphones, tablets).
- Server infrastructure to host the application and database.
- MediAccess Card with embedded NFC chip.

Software Requirements:

- Backend server (Node.js, PHP, etc.).
- Database management system (MySQL).
- Mobile application (iOS/Android).
- Security software for data encryption and secure access.

3.5 Techniques Utilized Till Date for the Proposed System

1. Data Encryption: Utilizing AES (Advanced Encryption Standard) for securing patient data.

2. RESTful API Development: For communication between the mobile application and backend server.
3. NFC Technology: Implementing NFC standards for data transfer and access.
4. Real-Time Data Synchronization: Using WebSocket or similar technologies for real-time updates.

3.6 Tools Utilized Till Date for the Proposed System

1. Development Tools:
    - Integrated Development Environment (IDE): Visual Studio Code, Android Studio.
    - Version Control: Git and GitHub for collaboration and code management.
2. Database Tools:
    - MySQL Workbench or similar for database design and management.
3. Security Tools:
    - OpenSSL for encryption and secure communication.
    - OWASP ZAP for security testing.
4. Project Management:
    - Trello or Jira for task management and progress tracking**.**

3.7 Project Proposal

Project Title: MediAccess Card: Revolutionizing Patient Data Management

Introduction: The MediAccess Card project aims to enhance patient data management in healthcare by integrating NFC technology. This innovative solution allows healthcare professionals to access and update patient records securely and efficiently, ensuring better healthcare delivery.

Objective: To provide a secure, portable, and user-friendly solution for managing patient information, enabling seamless access and updates of medical data.

Scope:

- Development of an NFC-enabled card for patient data access.
- Creation of a mobile application for healthcare professionals.

- Implementation of a backend system for data management and synchronization.

Expected Outcomes:

- Improved efficiency in accessing and managing patient data.
- Enhanced accuracy of medical records.
- Increased patient satisfaction through timely updates and notifications.

Budget and Timeline:

- An estimated budget for development, testing, and deployment.
- A proposed timeline with milestones for each phase of the project.

Conclusion: The MediAccess Card has the potential to transform the way patient data is managed in hospitals, ensuring secure and efficient access to vital medical information. By leveraging NFC technology, we aim to improve the overall quality of healthcare services.

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