Mcare

(Integrated Patient & Doctor Healthcare Management System)

A Project Report

Submitted in partial fulfilment of the
Requirements for the award of the Degree of

BACHELOR OF SCIENCE
(INFORMATION TECHNOLOGY)

By

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CERTIFICATE

This is to certify that the entitled, "**Mcare (**Integrated Patient & Doctor Healthcare Management System**)**", is bonafied work of **Bhagat Rajan Vinod** bearing Seat No. **410** submitted in partial fulfilment of the requirements for the award of degree of BACHELOR OF SCIENCE in INFORMATION TECHNOLOGY from University of Mumbai.

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Abstract / Synopsis
Mcare (Integrated Patient & Doctor Healthcare Management System).

Introduction:-

Mcare is a web application designed to improve healthcare by simplifying appointment scheduling, treatment documentation, and medication adherence. It offers a user-friendly interface for patients and providers, addressing key challenges such as managing appointments, maintaining records, and ensuring medication compliance. By leveraging cloud technologies, Mcare enhances the efficiency, accessibility, and security of healthcare services, resulting in improved patient satisfaction and optimized provider workflows.

Objective:-

Mcare improves healthcare by simplifying appointment management, providing secure prescriptions, and automated medication reminders. It supports telemedicine with secure video consultations and centralizes patient records, enhancing efficiency and security for both patients and providers. New features can be added as per requirements.

Scope:-

- Provide a cloud-based platform for streamlining healthcare services.
- Facilitate appointment scheduling, treatment documentation, and medication reminders for patients.
- Enable doctors to manage schedules, treatments, and ensure patient compliance.
- Support telemedicine for secure remote consultations.
- Ensure secure access to health records and patient data.
- Focus on improving healthcare efficiency, accessibility, and patient satisfaction through a user-friendly interface and cloud technologies.

Key Feature:-

- **User Registration and Authentication:** Secure login with role-based access.
- **Appointment Management:** Search doctors, flexible booking, and schedule management.
- **Treatment and Prescription Management:** Electronic prescriptions and access to treatment plans.
- **Medication Reminders:** Automated reminders via SMS, email, or push notifications.
- **Health Records Management:** Centralized records with upload and access for patients and doctors.
- **Telemedicine:** Secure video consultations and integrated messaging.
- **Dashboard Features:**
    - Patient: Manage appointments, records, prescriptions, and consultations.
    - Doctor: Manage schedules, records, prescriptions, and communication.
    - Admin: Oversee usage, roles, security, reports, and feedback

Software Requirements:-

- **Frontend Technologies:** HTML, JavaScript, React.js, Angular.js, Tailwind CSS.
- **Backend Technologies:** Node.js, Express.js, MongoDB
- **Cloud Services:** AWS, GCP, Azure
- Visual Studio Code, Git
- **Database:** MongoDB, RDS, Cloud SQL

Hardware Requirements:-

- Minimum 8 GB RAM or higher.
- Intel core i5 processor.
- Android device for testing and with internet

Advantages:-

- Centralized management of appointments and records.
- Better communication and coordination between patients and doctors.
- Automated reminders for improved medication adherence.
- Secure and scalable cloud infrastructure.
- Support for in-person and telemedicine consultations**.**

Disadvantages:-

- Requires internet connectivity for access.
- Login is necessary to get services from this application.
- Dependency on cloud service providers for uptime and security

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At last but not the least I want to thank all of my friends who helped/treasured me out in completing the project, where they all exchanged their own interesting ideas, thoughts and made this possible to complete my project with all accurate information. I wish to thank my parents for their personal support or attention who inspired/encouraged me to go my own way.

DECLARATION

I hereby declare that the project entitled, "**Mcare Integrated Patient and Doctor Healthcare Management System**" done at **Guru Nanak Khalsa College**, has not been in any case duplicated to submit to any other university for the award of any degree. To the best of my knowledge other than me, no one has submitted to any other university.

The project is done in partial fulfilment of the requirements for the award of degree of **BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)** to be submitted as final semester project as part of our curriculum.

Bhagat Rajan Vinod

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CHAPTER 1: INTRODUCTION

1.1 Background

In recent years, healthcare systems worldwide have encountered numerous inefficiencies, particularly in managing appointments, treatment records, and medication adherence. Traditional systems often lack the technological infrastructure needed to support seamless communication between patients and healthcare providers, leading to suboptimal patient outcomes and administrative burdens on medical staff. Additionally, the growing demand for healthcare services has intensified the need for scalable solutions that can accommodate an increasing volume of patients without sacrificing quality of care.

The **Mcare** project is designed as a comprehensive solution to address these gaps. It leverages cloud technology to improve the efficiency and accessibility of healthcare services. **Mcare** simplifies the process of appointment booking, rescheduling, and cancellation, allowing patients to interact with healthcare providers with minimal friction. For healthcare professionals, **Mcare** offers an organized system to manage patient interactions, document treatments, and ensure adherence to prescribed medication regimens. A central feature of **Mcare** is its dashboard system, which offers tailored interfaces for patients, doctors, and administrators, ensuring an optimized and efficient experience for all users.

Through features such as seamless appointment management, secure treatment documentation, and telemedicine support, Mcare aims to improve the quality and accessibility of healthcare services. Additionally,

it ensures the secure and centralized storage of patient health records, enhancing coordination between healthcare stakeholders.

1.2 Objective

The objective of the Mcare project is to create a comprehensive cloud-based healthcare management platform. This platform will streamline the management of healthcare services, including the booking, rescheduling, and cancellation of appointments, and support appointment scheduling for doctors. It will also provide secure treatment documentation, medication reminders, and telemedicine support. It Provide a secure platform for doctors to prescribe treatments and medications. The primary aim of the project is to provide patients and healthcare providers with an efficient and user-friendly solution that facilitates easy appointment management, secure medical reports, effective treatment documentation, and seamless telemedicine interactions, ensuring improved healthcare experiences for all users.

1.3 Purpose, Scope and Applicability

1.3.1 Purpose

The purpose of the Mcare project is to create a cloud-based healthcare management platform that addresses inefficiencies in traditional systems. This platform is designed to enhance patient engagement by providing a user-friendly interface for managing appointments, accessing medical records, and receiving medication reminders. It aims to streamline clinical workflows by offering a centralized system for healthcare providers to manage patient interactions, document treatments, and ensure adherence to medication regimens. Additionally, Mcare seeks to improve telemedicine

capabilities with secure video consultations and integrated messaging. The platform will ensure secure and scalable data management to maintain the confidentiality, integrity, and availability of patient health records. Ultimately, Mcare strives to improve the quality, accessibility, and efficiency of healthcare services, leading to better patient outcomes and provider satisfaction.

1.3.2 Scope

The Mcare project aims to improve inefficient manual healthcare systems by developing a comprehensive cloud-based clinic management platform, replacing manual data storage and paper forms with a more efficient solution.

The scope includes developing a user-friendly platform for patients to manage appointments, access records, and receive medication reminders, while providing healthcare providers with a centralized system for managing interactions, documenting treatments, and monitoring medication adherence. It will also feature a telemedicine module for secure video consultations and messaging.

The project will create a secure, scalable cloud infrastructure for managing patient health records, ensuring data confidentiality, integrity, and availability. It will feature patient registration and authentication, appointment and treatment management, medication reminders, health records management, and a dashboard for all users.

1.3.3 Applicability

The Mcare project has a wide range of applicability in the healthcare industry, particularly in clinics and hospitals in India. The project's

automated administration and management system can be applied in various settings, including:

- **Clinics**: The project can be implemented in clinics of all sizes, from small private clinics to large multi-specialty clinics.
- **Hospitals**: The project can be applied in hospitals, including government and private hospitals, to improve the efficiency of their administration and management systems.
- **Rural Healthcare**: The project can be particularly useful in rural areas where access to healthcare is limited and manual systems are still prevalent.
- **Telemedicine**: The project's telemedicine feature can be applied in various settings, including remote healthcare services, online consultations, and telehealth services.
- **Healthcare Chains**: The project can be implemented in healthcare chains, including multi-specialty hospitals and clinics, to standardize their administration and management systems.

CHAPTER 2 : SURVEY OF TECHNOLOGIES

2.1 Introduction

In day to day life, we will need to visit hospitals or clinics for various medical purposes. It may be for doctor's appointments, medical check-ups, or to purchase medicines. Nowadays, it is really hard to get some time to visit hospitals or clinics due to busy lifestyles or long waiting queues. In order to solve this, Clinic Management Systems like Mcare have been developed. Using these systems, patients can manage their medical records, book appointments online, access medical services digitally, and even consult with doctors remotely through telemedicine. Moreover, doctors can also use the system to schedule appointments, provide digital prescriptions, and share medical reports with patients, making healthcare more accessible, convenient, and efficient.

2.2 Existing System

Currently, many healthcare clinic or hospital centers use manual systems to manage and store essential data. This approach involves numerous paper forms and scattered databases throughout the facility. Data often becomes fragmented and fails to adhere to management standards. In many healthcare centers ,hospital or clinic traditional manual systems are still used to manage and store patient data. These systems rely heavily on physical documents and manual processes, which can lead to various inefficiencies and challenges. Forms are frequently misplaced during transfers between departments, necessitating thorough reviews to ensure no information is lost. Multiple copies of the same data lead to inconsistencies across various records.

Patients and healthcare providers face difficulties due to fragmented data, lost or misplaced documents, and inconsistent records across different departments. Manual systems often lead to inefficiencies, such as longer wait times, higher chances of errors, and delays in accessing critical information. Additionally, these systems struggle with data security and require extensive administrative effort to manage and process information.

Disadvantage of current existing manual system of healthcare:

2.1 Time-Consuming The existing system is tedious, with a significant amount of time wasted in searching and organizing patient data.

2.2 Poor Security and Data Protection The system lacks adequate security measures, putting patient data at risk of unauthorized access and compromising confidentiality.

2.3 File Mismanagement There is a high degree of scattering of patient files, making it difficult to locate and retrieve information when needed.

2.4 Long Wait Times Patients are forced to wait for longer periods due to the inefficiencies of the manual system.

2.5 Data Inconsistencies The manual system is prone to errors, miscopying, and inconsistencies in data entry, which can lead to inaccurate diagnoses and treatment plans.

2.6 Limited Data Sharing and Patient Services The existing system hinders effective data sharing and patient services, leading to poor healthcare outcomes.

2.7 Lack of Security The system lacks adequate security measures, putting patient data at risk of unauthorized access and compromising confidentiality.

2.8Data Duplication The manual system leads to redundant data entry, resulting in data inconsistencies and errors.

2.3 Market Survey

The healthcare industry is witnessing a significant shift towards digitalization, with various clinic management systems emerging to cater to the needs of patients and healthcare providers. However, many of these systems have limitations and drawbacks. The market for healthcare management systems is diverse, with various systems available across different price ranges and from numerous providers, including Practo, Zocdoc, Healthgrades, and others. Many alternative systems lack a comprehensive dashboard, making it difficult for patients, doctors, and administrators to manage appointments, records, and communication. Additionally, existing systems often fail to provide secure prescription management, putting patient data at risk of unauthorized access. Furthermore, automated medication reminders are often absent, leading to poor medication adherence. Finally, few systems integrate telemedicine capabilities, limiting the scope of remote consultations.

The following key points were observed during the market survey:

Alternative Systems and their Problems

1. **Manual Systems**: Manual systems are still prevalent in many healthcare centers, relying on physical documents and manual processes. These systems are time-consuming, prone to errors, and lack data security.
2. **Existing Digital Systems**: Many existing digital systems are fragmented, with limited features and functionalities. They often lack user-friendly interfaces, making it difficult for patients and healthcare providers to navigate.
3. **Telemedicine Platforms**: Telemedicine platforms are limited in their scope, focusing primarily on video consultations and lacking comprehensive features for clinic management.

Alternative Websites in market and their Disadvantages

1. **Practo**:
    - Disadvantages: Limited features for clinic management, no integrated telemedicine, and no secure prescription management.
    - Features Missing: Comprehensive dashboard, automated medication reminders, and secure prescription management.
2. **Zocdoc**:
    - Disadvantages: Primarily focused on appointment scheduling, lacks comprehensive clinic management features, and no telemedicine integration.
    - Features Missing: Secure prescription management, automated medication reminders, and integrated telemedicine.
3. **Healthgrades**:
    - Disadvantages: Limited features for clinic management, no telemedicine integration, and no secure prescription management.
    - Features Missing: Comprehensive dashboard, automated medication reminders, and integrated telemedicine.

The existing healthcare management systems have several limitations, including the lack of comprehensive dashboards, secure prescription management, automated medication reminders, and integrated telemedicine capabilities, which can lead to inefficiencies, errors, and poor patient outcomes.

2.4 Proposed System

To remove all the disadvantages of conventional methods, **Mcare** is a system is proposed which is a comprehensive cloud-based healthcare management platform. The purpose of **Mcare** system is to improve the efficiency and accessibility of healthcare services, reduce wait times, and enhance patient engagement. One can access medical records, schedule appointments, and receive medication reminders online. This system can save time and improve healthcare outcomes because it provides a centralized and automated management system for healthcare providers and patients.

This platform offers seamless access to health records, appointment scheduling, and secure online communication for both patients and healthcare professionals. The project also ensures data security and confidentiality, providing a user-friendly interface for administrators to manage clinic operations.

Mcare application provides various features such as

- **Appointment Management:** Schedule, reschedule, and manage appointments.
- **Treatment and Prescription Management:** Document treatments and issue electronic prescriptions.
- **Medication Reminders:** Automated reminders for medication adherence.
- **Health Records Management:** Access and manage medical records securely.
- **Telemedicine:** Secure video consultations and integrated messaging.
- **Comprehensive Dashboard:** Centralized interface for patients, doctors, and administrators to manage their activities.

Advantages of Proposed System

- Enhanced patient care through online appointments and medication reminders.
- Secure access to patient health records for both doctors and patients.
- Telemedicine feature allows for remote consultations, improving healthcare accessibility.
- Reduces paperwork and administrative delays.
- Streamlines clinic operations, improving efficiency and reducing human errors.
- Real-time access to patient information, ensuring better decision-making.
- Ensures data security, privacy, and compliance with healthcare standards.
- Supports multi-user roles (patients, doctors, and administrators) with personalized dashboards.