

Smart Health Camp Management System for the Nadamaadum Maruthuvamanai Initiative in Tamil Nadu

ELAVARASI I

Master of Computer Applications, Nehru Institute of Information Technology and Management,
Tamilnadu, India. Reg. No: 721524622020 | Batch: 2024 – 2026 –

MENTOR – Mr.P.Sivakumar MCA, Asst Professor [Department of computer Applications]

Abstract

In 2026, the demand for equitable healthcare in rural and underserved regions of Tamil Nadu has necessitated the modernization of the Nadamaadum Maruthuvamanai (Mobile Health Unit) initiative. While these mobile units successfully bridge the geographical gap, traditional manual record-keeping often leads to data silos, delayed follow-ups, and inefficient resource allocation. This project proposes a Smart Health Camp Management System—an integrated digital framework designed to streamline mobile medical operations. Rapid digital registration and synchronization with the existing Population Health Registry (PHR) for continuous monitoring. Automated tracking of medical inventory and staff deployment to optimize camp schedules based on regional health trends. Integration of smart diagnostic tools for immediate screening of non-communicable diseases (NCDs), with results instantly uploaded to a centralized Health Management Information System (HMIS). A seamless digital pipeline connecting mobile units to District Headquarters Hospitals and upgraded Primary Health Centres (PHCs) for advanced care.

Keywords:

MERN stack, real-time monitoring, Patient, Module, Medical Services

Introduction

Healthcare accessibility remains a significant challenge in rural and underserved regions, where people often face difficulties in reaching medical facilities due to distance, transportation limitations, and lack of healthcare infrastructure. To address these challenges, the Government of Tamil Nadu has

introduced initiatives such as **Nadamaadum Maruthuvamanai (Mobile Medical Hospital)**, which aims to bring quality healthcare services directly to communities through mobile medical units. These units provide essential healthcare services, including consultations, diagnostic screenings, preventive care, and treatment, at the doorstep of citizens.

The **Smart Health Camp Management System** is designed to enhance the efficiency, accessibility, and management of health camps conducted under the Nadamaadum Maruthuvamanai initiative. Traditional health camp management often involves manual registration, paper-based record keeping, difficulties in patient tracking, and delays in report generation. These challenges can affect service quality and limit the effective utilization of healthcare resources.

The proposed system leverages digital technologies to streamline the entire health camp workflow, including patient registration, appointment scheduling, health record management, medical screening, prescription generation, and data analytics. By maintaining centralized electronic health records and enabling real-time monitoring, the system improves coordination among healthcare professionals and ensures better continuity of care for patients.

Furthermore, the Smart Health Camp Management System supports data-driven decision-making by providing insights into patient demographics, disease prevalence, treatment outcomes, and resource utilization. This contributes to improved healthcare planning and helps authorities deliver timely and effective medical services to remote and vulnerable populations.

Overall, the project aims to modernize mobile healthcare delivery, improve operational efficiency,

reduce administrative burden, and support the vision of accessible and equitable healthcare for all citizens in Tamil Nadu.

Modules

1. User Module

The User Module allows patients and healthcare staff to access the system securely. Users can register, log in, update their profiles, and view relevant information based on their roles. Patients can access their health records, appointments, and notifications through this module.

Functions:

- User registration and login
- Profile management
- Password management
- View personal health information
- Secure authentication and authorization

2. Admin Module

The Admin Module is responsible for managing the overall system. The administrator can manage users, doctors, health camps, appointments, and system data. This module ensures smooth operation and monitoring of all activities within the health camp management system.

Functions:

- Manage users and staff accounts
- Create and schedule health camps
- Manage doctor assignments
- Monitor appointments and patient records
- Generate reports and analytics
- System maintenance and configuration

3. Doctor Module

The Doctor Module enables healthcare professionals to manage patient consultations and medical records efficiently. Doctors can access patient histories, record diagnoses, prescribe medications, and schedule follow-up visits.

Functions:

- View assigned appointments

- Access patient medical history
- Record diagnoses and treatment plans
- Generate digital prescriptions
- Recommend laboratory tests
- Schedule follow-up consultations

4. Notification Module

The Notification Module helps maintain effective communication between patients, doctors, and administrators. It automatically sends alerts and reminders regarding appointments, camp schedules, prescriptions, and follow-up visits.

Functions:

- Appointment reminders
- Health camp notifications
- Follow-up visit alerts
- Prescription and medication reminders
- Emergency announcements
- SMS, email, or mobile notifications

5. Patient Appointment Module

The Patient Appointment Module manages the booking and scheduling of patient visits during health camps. It helps reduce waiting times and ensures organized patient flow.

Functions:

- Book appointments for health camps
- View available doctors and time slots
- Appointment confirmation and cancellation
- Token and queue management
- Track appointment status
- View appointment history

Form Design

1. User Registration Form

- User Name
- Email
- Password
- Confirm Password
- Phone Number
- Role (Patient/Doctor)

2. Login Form

- Email
- Password
- Login Button

3. Patient Registration Form

- Patient Name
- Age
- Gender
- Address
- Phone Number
- Blood Group
- Submit Button

4. Doctor Registration Form

- Doctor Name
- Specialization
- Qualification
- Availability
- Contact Number
- Save Button

5. Appointment Booking Form

- Patient Name
- Doctor Name (Dropdown)
- Appointment Date
- Appointment Time
- Submit Button

6. Medical Record Form

- Patient ID
- Diagnosis
- Prescription
- Visit Date
- Save Record Button

7. Notification Form

- User Selection
- Notification Message
- Send Button

8. Admin Dashboard

- Total Patients
- Total Doctors
- Upcoming Appointments

- Notifications Summary
- Reports Section

Relationships

- One Admin manages many Doctors and Patients.
- One Doctor can have many Appointments.
- One Patient can book many Appointments.
- One Appointment belongs to one Doctor and one Patient.
- One Patient can have multiple Medical Records.
- One User can receive multiple Notifications.

System Output



Modules

Methodology

The Smart Health Camp Management System is developed using a systematic approach to improve the management of mobile healthcare camps conducted under the Nadamaadum Maruthuvamanai initiative. The methodology follows the Software Development Life Cycle (SDLC) to ensure efficient planning, development, testing, and deployment of the system.

1. Requirement Analysis

The first phase involves gathering and analyzing the requirements of healthcare administrators, doctors, and patients. The challenges in traditional health camp management, such as manual record keeping,

appointment scheduling difficulties, and data management issues, are identified.

2. System Design

Based on the requirements, the system architecture, database structure, user interfaces, and workflow processes are designed. The main modules include User Management, Admin Management, Doctor Management, Patient Appointment Management, and Notification Management.

3. Database Design

A centralized database is designed to store patient records, doctor information, appointment details, notifications, and medical history securely. Relationships between entities are established to ensure data consistency and integrity.

4. System Development

The application is developed using appropriate programming languages, frameworks, and database technologies. Individual modules are implemented and integrated to provide seamless functionality across the system.

5. Testing

Comprehensive testing is conducted to ensure system reliability and performance. Unit testing, integration testing, and user acceptance testing are performed to identify and correct errors before deployment.

6. Implementation

After successful testing, the system is deployed for use in health camps. Administrators, doctors, and patients can access the system according to their assigned roles and permissions.

7. Monitoring and Maintenance

The system is continuously monitored to ensure smooth operation. Regular updates, bug fixes, and enhancements are performed based on user feedback and operational requirements.

Working Process

1. Patient registers in the system.
2. Patient books an appointment for a health camp.
3. Admin manages doctors, appointments, and camp schedules.
4. Doctor views assigned appointments and patient details.
5. Doctor records diagnosis and treatment information.
6. Notifications are sent for appointments, follow-ups, and camp updates.
7. Reports are generated for monitoring healthcare services and camp performance.

This methodology ensures efficient healthcare service delivery, improved patient management, reduced paperwork, and enhanced accessibility to medical services through mobile health camps.

Conclusion

The Smart Health Camp Management System developed for the Nadamaadum Maruthuvamanai initiative provides an effective digital solution for managing mobile healthcare camps. The system simplifies the processes of patient registration, appointment scheduling, doctor consultation, notification management, and health record maintenance through a centralized platform.

References

1. https://www.researchgate.net/publication/401101649_Smart_Health_Camp_Management_System_Using_MERN_Stack
2. <https://ijsrem.com/download/smart-health-camp-management-system-using-mern-stack>
3. <https://www.nhm.tn.gov.in/en/r-c-h/mobile-medical-units-mmu>
4. <https://www.nhm.tn.gov.in/en/r-c-h/mobile-medical-units-mmu>