ABSTRACT

The **Dental Collaboration Platform for Orthodontics-MGPGIDS (Faculty Vision)** is a web-based platform designed to streamline the management of academic and patient care processes for the Department of Orthodontics and Dentofacial Orthopaedics. The system addresses the challenges of manual record-keeping by automating and digitizing various workflows, including the management of patient cases, academic records, and faculty operations. The system is built using the MERN stack (MongoDB, Express.js, React, Node.js), ensuring a scalable, robust, and interactive experience for users. The platform provides three main user roles: Faculty, Students (BDS and MDS), and Patients.

Faculty members play a pivotal role in managing both academic and clinical operations within the system. They can oversee student attendance, internal marks, and exam schedules for both BDS and MDS programs, ensuring smooth academic management. In addition, faculty members are responsible for reviewing and providing feedback on patient cases uploaded by students, maintaining high standards of accuracy and quality in clinical submissions. They can also upload and share academic resources, including seminar notes and presentations, fostering an enriched learning environment. With full access to all records, faculty can modify both student and patient data as needed, ensuring up-to-date and accurate information across the platform. Furthermore, faculty members can manage their profiles to highlight professional achievements, research contributions, and seminar activities, promoting transparency and collaboration within the academic community.

1. Introduction

The Dental Collaboration Platform for Orthodontics-MGPGIDS (Faculty Vision) is a comprehensive web-based platform designed to streamline and digitize academic and clinical workflows within the Department of Orthodontics and Dentofacial Orthopaedics. The primary aim is to replace manual record-keeping with an automated system that enhances efficiency, accuracy, and accessibility.

The system is built using the MERN stack (MongoDB, Express.js, React, Node.js), offering a robust, scalable, and user-friendly experience. It provides role-based access to three key user groups:

- **Faculty Members**: Manage academic and patient records, oversee student activities, and contribute to clinical case evaluations.
- **Students (BDS & MDS)**: Upload patient case details, access academic materials, and track their academic progress.
- **Patients**: Benefit from structured clinical case management and faculty-supervised treatment plans.

The Faculty Module is a vital part of the system, providing academic and administrative functionalities that enable faculty members to manage students and patient cases effectively. This report will elaborate on the Faculty Module, covering its system analysis, design, implementation, and features.

2. Faculty Module

2.1 Overview

The Faculty Module plays a crucial role in academic and clinical management. Faculty members use this module to handle student records, attendance, and marks, review patient case submissions, and share academic resources. The module ensures seamless coordination between faculty and students, fostering a structured and interactive academic environment. The key functionalities available to faculty include:

- **Faculty Login**: Secure authentication system for faculty members.
- **Faculty Profile Management**: Update personal and professional details, including research contributions and seminar activities.
- **Attendance Management**: Post and manage student attendance records.
- **Marks Management**: Input and maintain internal marks for BDS and MDS students.
- **Patient Case Management**: Review, edit, and approve patient cases submitted by students.
- **Academic Resource Sharing**: Upload and distribute educational materials such as seminar notes, presentations, and research articles.

2.2 System Analysis

2.2.1 Existing System

Before implementing the Dental Collaboration Platform for Orthodontics-MGPGIDS(Faculty Vision), faculty members relied on paper-based methods for attendance tracking, marks entry, and patient case reviews. These traditional methods posed several challenges:

- **Time-consuming processes**: Manually handling attendance and marks consumes significant faculty time.
- **Data loss risks**: Paper-based records are vulnerable to misplacement and damage.

- **Lack of accessibility**: Faculty and students struggle to access information conveniently.
- **Inefficient patient case management**: Reviewing and approving patient cases manually is tedious and prone to errors.

2.2.2 Proposed System

The Faculty Module in the Dental Collaboration Platform for Orthodontics-MGPGIDS(Faculty Vision) automates these processes, ensuring:

- **Digital record-keeping**: Secure, centralized storage of academic and clinical data.
- **Real-time updates**: Faculty can instantly update attendance, marks, and patient cases.
- **Improved accessibility**: Faculty members can manage their tasks from anywhere via a web interface.
- **Better collaboration**: Faculty can seamlessly communicate with students and access academic materials.

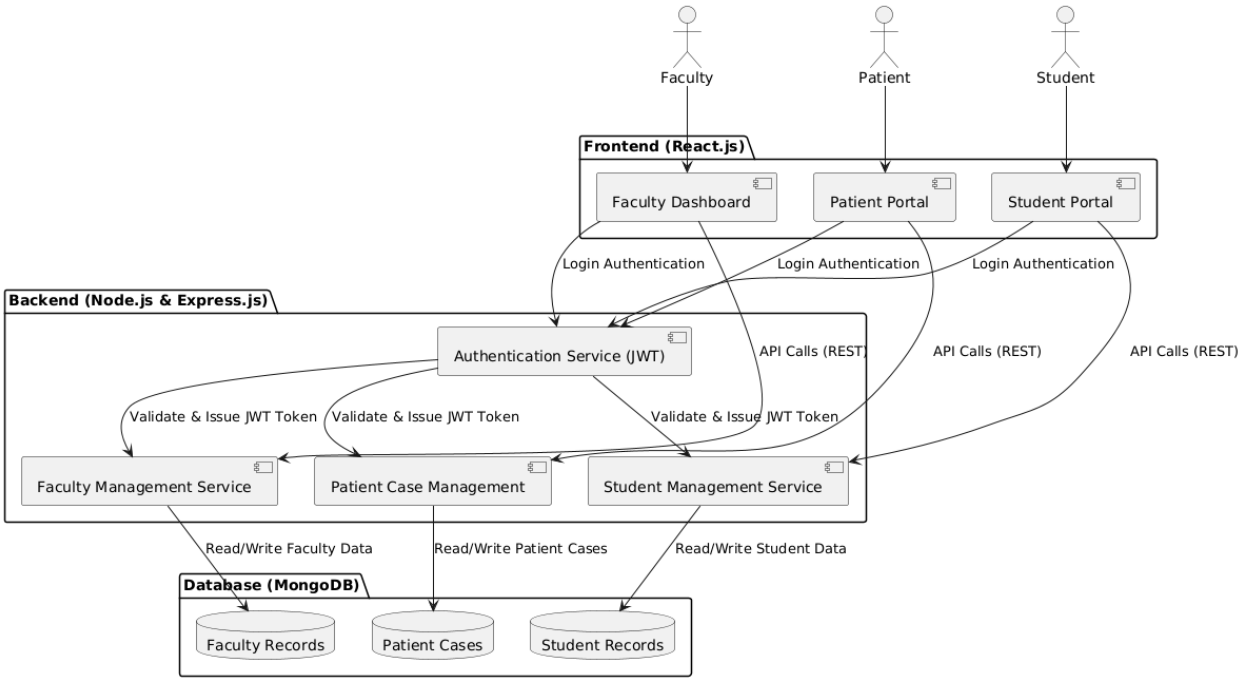
2.3 System Design

2.3.1 Architecture

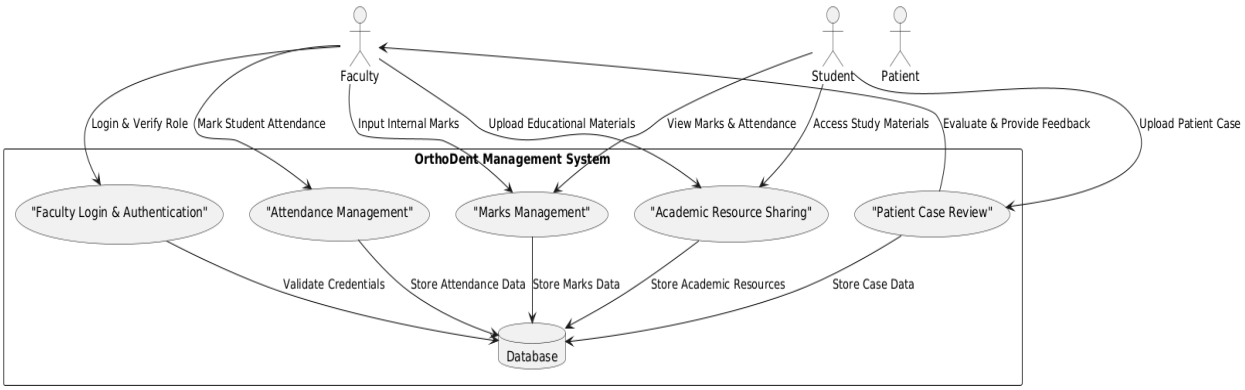
The Faculty Module follows a structured multi-tier architecture consisting of:

- **Frontend**: React.js is used for an intuitive and interactive user interface.
- **Backend**: Node.js and Express.js handle faculty-related operations.
- **Database**: MongoDB securely stores faculty profiles, student records, and patient cases.
- **Security**: Authentication is managed using JWT (JSON Web Token) for secure role-based access.

2.3.2 Architecture Diagram



2.3.3 Data Flow Diagram (DFD)



A structured data flow ensures seamless faculty operations:

- **Faculty Login & Authentication** → Secure login process with role verification.
- **Attendance Management** → Faculty marks student attendance, and records are stored in the database.
- **Marks Management** → Faculty inputs internal marks, which students can view later.

- **Patient Case Review** → Faculty evaluates student-uploaded cases and provides feedback.
- **Academic Resource Sharing** → Faculty uploads and manages educational materials.

2.4 Implementation

The Faculty Module is implemented using the following technologies:

- **Frontend**:
    - React.js for the user interface.
    - Material-UI for an improved UI/UX experience.
- **Backend**:
    - Node.js and Express.js for faculty-specific API development.
- **Database**:
    - MongoDB with Mongoose for structured storage of faculty, student, and patient data.
- **Security Features**:
    - JWT authentication for secure faculty logins.
    - Role-based access control for different user permissions.

2.5 Faculty Module Features

2.5.1 Faculty Profile Management

- Update personal details, research contributions, and seminar activities.
- Maintain an organized professional profile for academic transparency.

2.5.2 Attendance Management

- Faculty can mark and update student attendance.
- Real-time tracking and reporting of attendance records.

2.5.3 Marks Management

- Faculty can enter and manage internal marks for BDS and MDS students.
- Digital record-keeping ensures accuracy and accessibility.

2.5.4 Patient Case Review

- Faculty can review, edit, and provide feedback on patient cases.
- Ensures quality and accuracy in clinical submissions.

2.5.5 Academic Resource Sharing

- Faculty can upload seminar notes, presentations, and research materials.
- Enhances student learning through easily accessible resources.

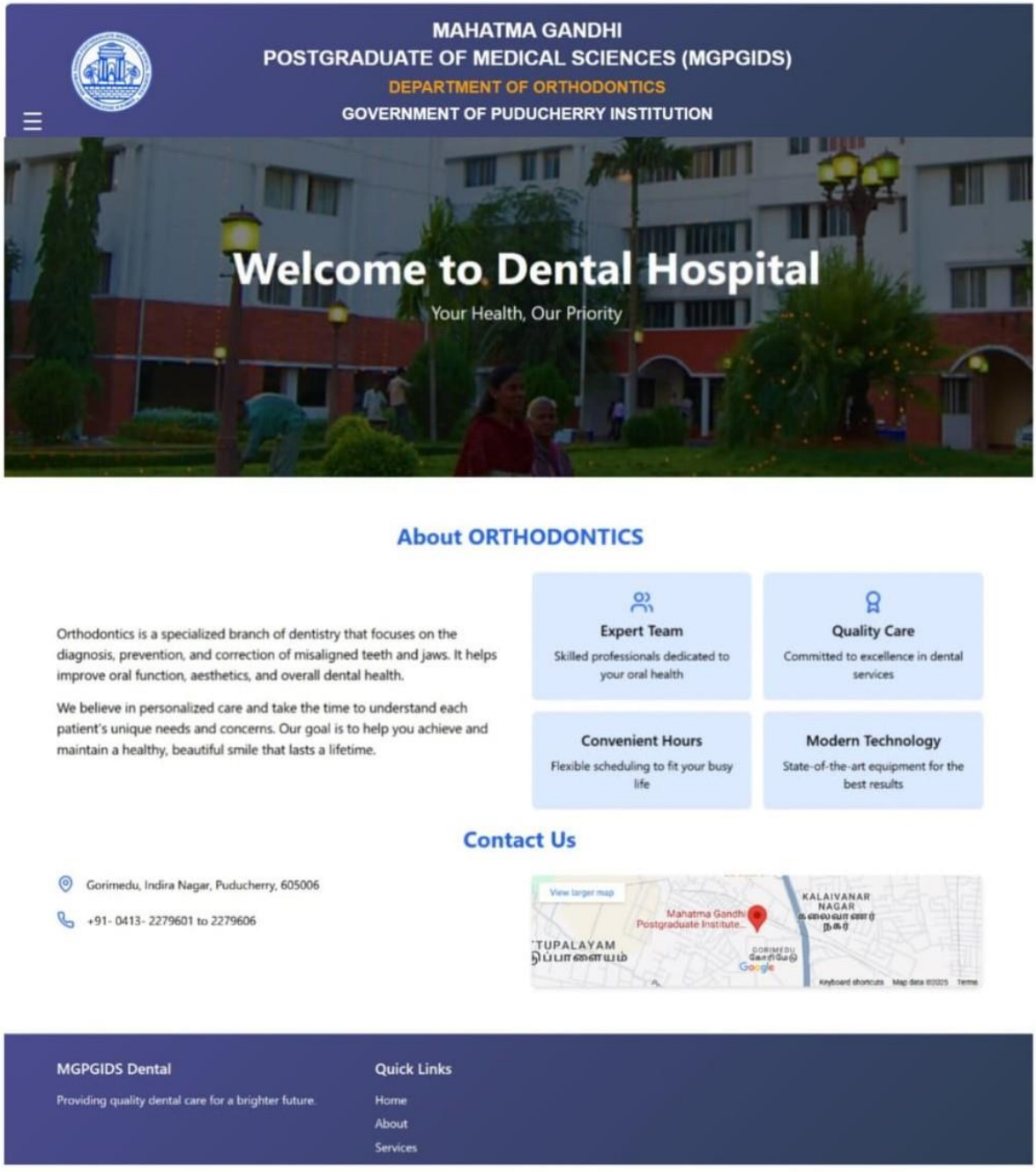
3. Objectives

The Faculty Module aims to:

- **Automate faculty operations**: Reduce manual workload by digitizing academic and clinical processes.
- **Ensure data accuracy**: Centralized and secure storage of student and patient records.
- **Enhance accessibility**: Faculty can manage their tasks from any location.
- **Improve collaboration**: Facilitate better faculty-student interactions through resource sharing.
- **Promote transparency**: Allow faculty to update and manage academic records efficiently.

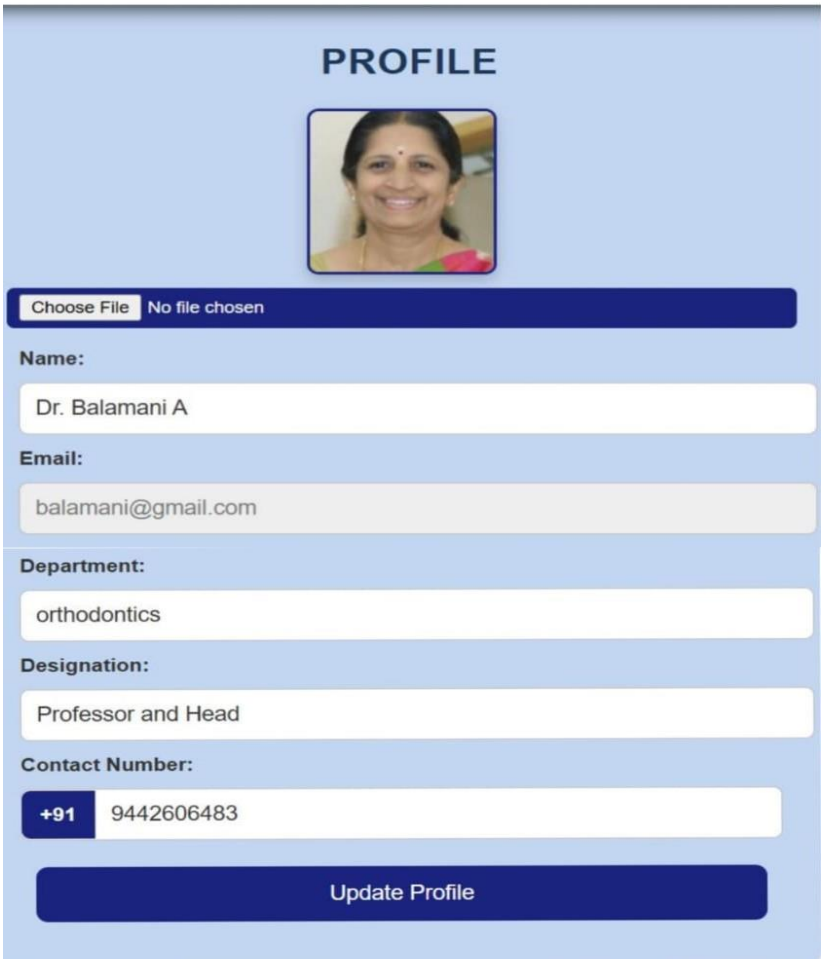
4. APPENDIX- SCREENSHOTS

Home Page



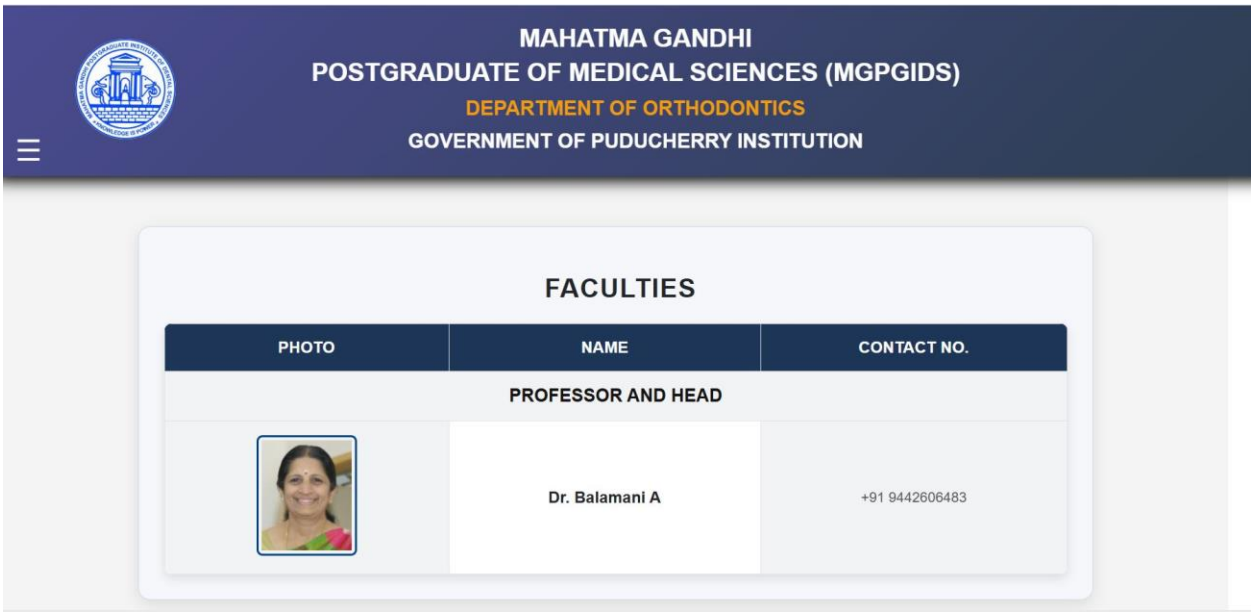
Faculty Dashboard

Faculty Profile

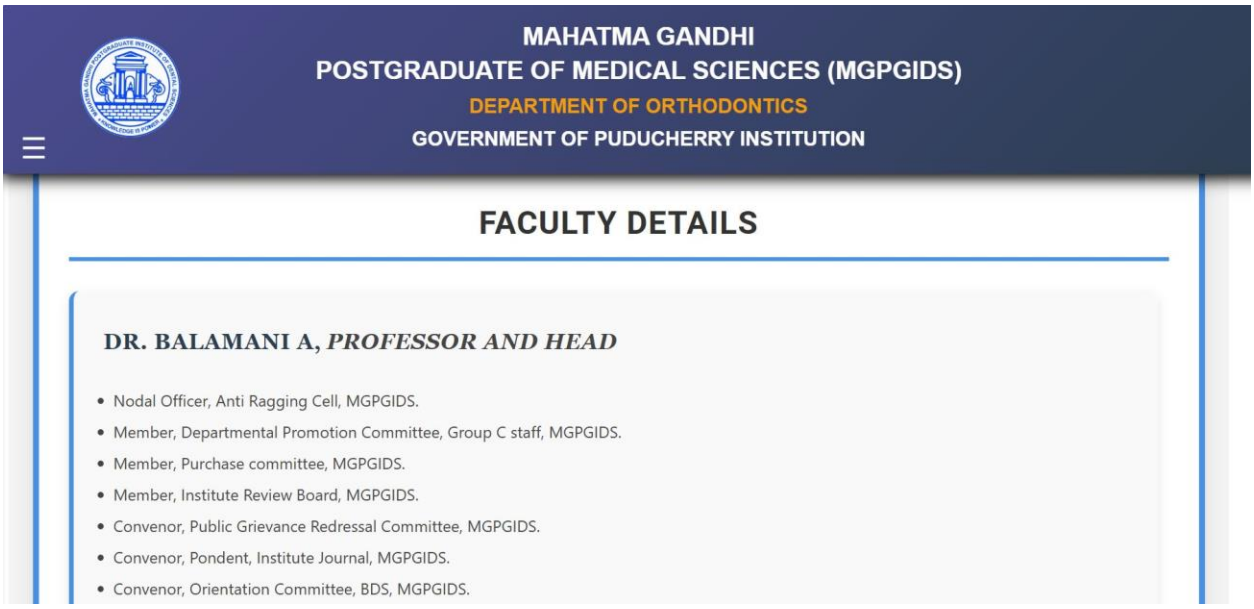


Add Faculty Activities

Faculty Details



Faculty Activities Detials



Students Attendance Entry