

International Islamic University Chittagong

Department of Computer Science and Engineering



Project Report On

Postpartum Depression Management App

Submitted to

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1. Executive Summary

Postpartum depression (PPD) is a significant, yet often underrecognized, mental health disorder affecting new mothers. It can lead to severe consequences, including difficulties in bonding with the child, long-term emotional issues for the mother, and developmental delays for the child.

This report outlines the development of the PPD Management App, a mobile application designed to provide early detection, continuous monitoring, and support resources for mothers suffering from PPD. The app integrates AI-powered assessments, telehealth features, and peer support networks to provide comprehensive mental health care.

2. Introduction

Postpartum depression (PPD) affects a significant percentage of new mothers worldwide.

Symptoms include persistent sadness, anxiety, fatigue, and emotional detachment, which can severely hinder the mother's ability to care for herself and her child. The PPD Management App aims to bridge the gap in mental healthcare by offering a solution that allows for early screening, continuous symptom tracking, and timely interventions.

3. Problem Statement

Despite its prevalence, PPD remains largely undiagnosed and untreated, especially in resource-limited settings. Many mothers, like Kentlee and Sadia (as presented in the case studies), struggle with overwhelming emotions and suicidal thoughts without appropriate support. Traditional healthcare models fail to provide timely screenings and interventions, which often leads to serious mental health complications for both mother and child.

4. Project Objectives

The objective of this project is to create an innovative mobile application that addresses the challenges posed by PPD by providing:

Early Detection: AI-powered assessments to detect symptoms of postpartum depression.

Self-Help Resources: A variety of coping tools such as guided meditation, cognitive behavioral therapy (CBT) techniques, and personalized diet plans.

Professional Support: Direct access to healthcare professionals via telehealth integration.

Family Engagement: Daily health reports sent to the mother's guardian or spouse for greater family involvement.

Peer Support: A community forum for mothers to share experiences and find emotional support.

5. System Design & Architecture

5.1 3-Tier Architecture

The app follows a 3-tier architecture to ensure separation of concerns and scalability:

- **Presentation Layer:** The mobile app interface built using Flutter allows smooth interaction between the user and the system.
- **Application Layer:** Handles all business logic, such as AI-based screening, data processing, and alerts.
- **Data Layer:** MySQL database stores all the data related to user profiles, assessments, daily reports, and professional profiles. Firebase is used for real-time synchronization of user data.

5.2 Tools and Technologies Used

Frontend:

Flutter: A cross-platform mobile framework to ensure seamless operation on both Android and iOS.

Backend:

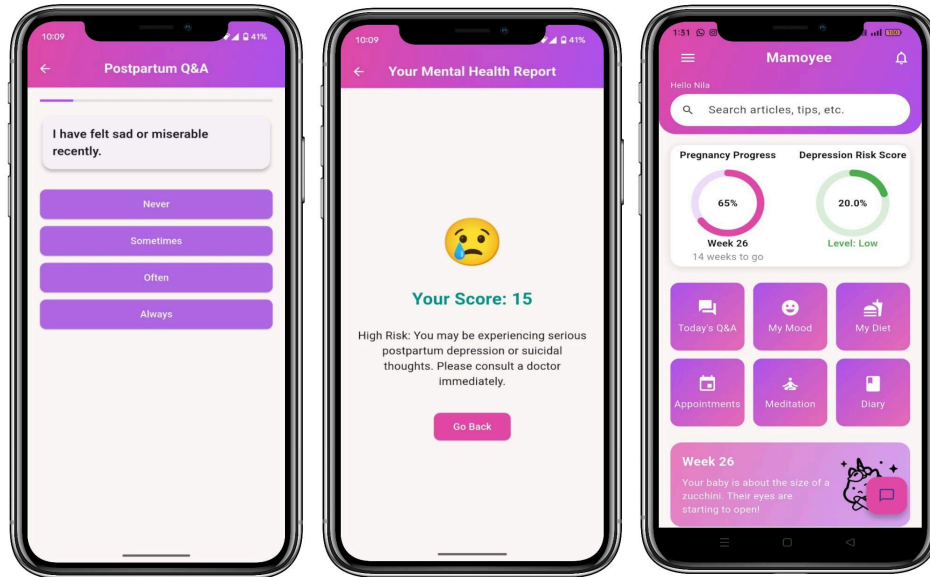
Node.js for handling server-side logic.

MySQL database to store and manage user data, assessments, and reports.

Firebase for authentication and real-time data synchronization.

AI Integration:

Machine learning algorithms for assessing symptoms and recommending interventions.



Flow of detection:

Types or Conditions of Postpartum Mental Health Disorders



Baby Blues

Postpartum Depression

Postpartum Psychosis

6. Flow of User Actions

6.1 User Interaction

The user journey begins when the mother logs in, takes an assessment, and receives daily reports. Below is a breakdown of the flow:

Login: User logs into the system via Firebase authentication.

Mental Health Screening: AI-powered questionnaire assesses the risk of PPD.

Daily Health Tracking: The app asks for daily updates on mood, sleep, and other symptoms.

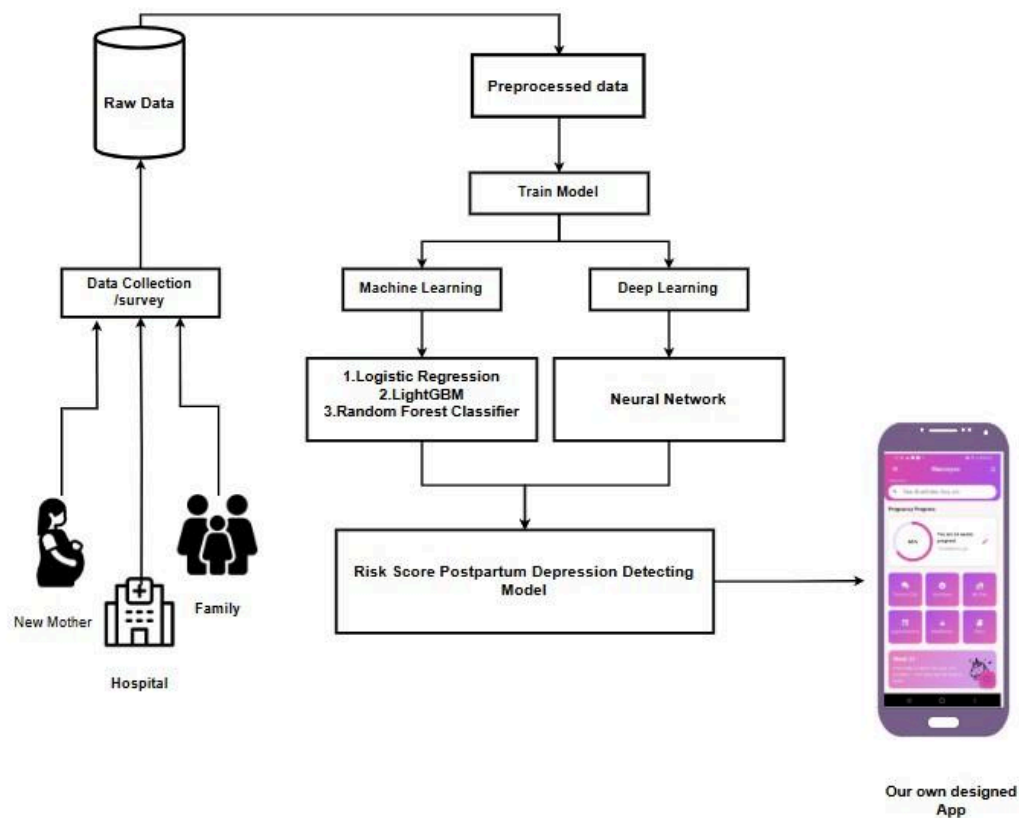
Generate Reports: Based on the daily input, the system generates reports and sends them to family members.

Connect with Professionals: If the symptoms are severe, the app connects the user to a professional for telehealth consultations.

Community Support: Users can participate in the community forum to engage with other mothers.

Flowchart:

(Attached flowchart showing the step-by-step process from user login to daily report generation.)



7. System Models

7.1 Class Diagram

The app's structure is modeled using class diagrams, which detail the relationships between:

User (mother, professional, guardian)

Assessment (screening results and responses)

Report (daily mood, symptoms, and alerts)

Professional Profile (mental health professionals)

Forum Post (community engagement)

7.2 Sequence Diagram

For a typical user interaction, such as daily mood reporting:

User inputs mood/symptoms.

The system stores the data and triggers AI analysis.

Based on severity, the system generates and sends reports to the family or professional.

Alerts are sent if symptoms exceed a threshold.

7.3 State-Machine Diagram

User State:

Initial State: Registered

State 1: Profile Completed

State 2: Assessment Taken

State 3: Report Generated

Final State: Connected to Support

8. Economic Feasibility

Initial Development Cost: BDT 500,000 – 850,000, covering:

Development resources: software engineers, designers, and project management.

Cloud services, Firebase, and security compliance (HIPAA).

Marketing and outreach to target users.

Revenue Model:

Subscription fees, advertisements, and partnerships with healthcare professionals.

Ongoing Costs:

Monthly server and cloud maintenance (BDT 20,000).

Security and compliance upgrades (BDT 5,000 – 10,000/month).

9. Technical Feasibility

Platform Compatibility: The app is designed to be cross-platform, using Flutter for frontend and Firebase for backend.

Scalability: The app uses cloud services, ensuring that the infrastructure can scale as the user base grows.

Security: The app adheres to data protection regulations (HIPAA, GDPR), ensuring secure handling of sensitive user data.

10. Conclusion

The PPD Management App provides a comprehensive solution to managing postpartum depression. By leveraging cutting-edge technologies like AI, cloud storage, and real-time data synchronization, the app offers users early detection, self-help tools, professional support, and community engagement—all in one platform. This project stands to significantly improve the mental health care of mothers, bridging gaps in existing healthcare systems.

11. Recommendations

Future Integration: Incorporate additional mental health resources and increase the app's accessibility through language localization and further professional integrations.

Awareness Campaigns: Use social media platforms and healthcare partnerships to increase the reach and adoption of the app.