

Hackathon Submission Report

Executive Summary

Our team has developed a comprehensive maternal health monitoring solution that bridges the gap between expectant mothers and healthcare providers. The system offers a holistic approach to pregnancy care through a mobile application that integrates prenatal tracking, postnatal support, and remote monitoring capabilities. By leveraging portable ECG technology and intuitive tracking features, we aim to improve maternal health outcomes, especially in underserved communities.

We have already developed several mobile applications for the doctors of Saveetha University Hospital, based on the specific requirements of each department. These applications are available on both the Play Store and App Store for use by doctors and patients. We now propose to integrate all these features into a unified master project, with a focus on addressing prenatal and postnatal health issues, particularly for rural populations. This initiative will leverage AI integration to enable local offline access, ensuring better healthcare delivery in resource-limited settings.

Key Features Implemented

Comprehensive Pregnancy Monitoring

Our system provides a full suite of pregnancy monitoring tools:

- Weight tracking with trend analysis
- Fetal movement (kick) counter with daily targets
- Contraction timer for labour preparation
- Automated alerts for abnormal patterns
- Customizable reminders for medications and appointments

Fetal Growth Tracking

We've developed an interactive fetal growth chart that allows mothers to visualize their baby's development throughout pregnancy. The system:

- Tracks key developmental milestones by week
- Provides personalized growth charts based on initial measurements
- Compares growth metrics against standard percentiles
- Offers educational content about fetal development stages
- Alerts healthcare providers to potential growth concerns

Technical Implementation

The application architecture follows a user-centric design with multiple interconnected modules:

1. **Registration System** - Supports both online self-registration and offline registration with health worker assistance
2. **Authentication & Login** - Secure access to personal health information
3. **Document Verification** - Medical history validation and demographic data collection
4. **Dashboard** - Central hub for all monitoring features
5. **Support Systems** - Including chatbot assistance and emergency SOS functionality
6. **Telemedicine Integration** - Direct communication with healthcare providers

Healthcare Impact

Our solution addresses several critical challenges in maternal healthcare:

- **Accessibility:** Enables remote monitoring for patients in rural areas
- **Early Detection:** Identifies potential complications before they become critical
- **Continuous Care:** Maintains patient-provider connection between appointments
- **Education:** Empowers mothers with knowledge about their pregnancy
- **Mental Health Support:** Includes screening tools and resources for postpartum depression

Future Enhancements

While our current prototype demonstrates significant functionality, we plan several enhancements:

- Integration with additional wearable devices beyond ECG
- Machine learning algorithms for predictive analytics
- Integration with hospital electronic health records

Portable ECG Integration

A standout feature of our solution is the integration with portable ECG devices for remote monitoring:

- Enables real-time ECG data transmission to healthcare providers

- Allows for early detection of cardiac abnormalities
- Supports continuous monitoring for high-risk pregnancies
- Includes automated analysis to flag potential concerns
- Stores historical data for trending and comparative analysis

Project Status

The healthcare screens are currently in active development. Core functionality for fetal growth tracking and ECG integration has been implemented, with user testing underway. The complete application is projected to be ready for pilot deployment within the next development sprint.

Conclusion

Our Maternal Health Monitoring System represents a significant advancement in pregnancy care technology. By combining traditional monitoring methods with cutting-edge portable ECG technology and intuitive mobile interfaces, we're creating a solution that can improve maternal health outcomes while reducing the burden on healthcare systems. We believe this project has tremendous potential to make pregnancy safer and more manageable for women worldwide.