CHAILD

SYNOPSIS

MCA (Data Science)

Semester - III

Submitted by

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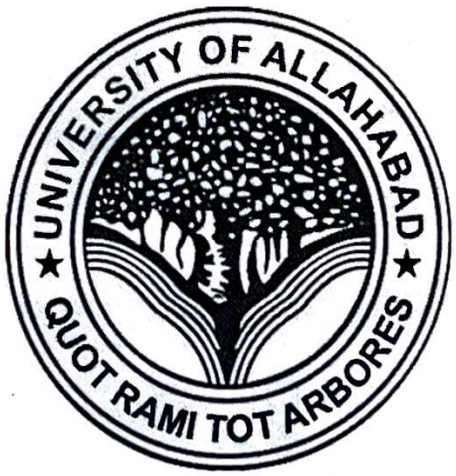
Batch Year – 2021-2026

Enrollment No. – U2144066

PROJECT GUIDE – Ms. SUNITA TRIPATHI



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1 INTRODUCTION

Project Title: ChAlid

Category: Full Stack

The ChAlid project addresses the critical need for accessible, reliable childcare support for Indian parents, especially those from low-income and rural backgrounds. With challenges such as language barriers, limited healthcare access, and fragmented information, many parents struggle to provide timely and effective care during their child's early developmental years.

ChAlid leverages advanced AI technologies, including multilingual natural language processing and personalized health tracking, to deliver tailored advice, vaccination reminders, and healthcare navigation. The system integrates secure child profile management, AI-powered chatbot assistance, and location-based healthcare services to empower parents with actionable, trustworthy guidance.

This project aims to build a user-friendly, inclusive platform that overcomes traditional barriers, improves early childhood health outcomes, and builds trust in digital childcare resources through personalized, context-aware support.

1.1 PROBLEM DEFINATION

Early childhood is a critical stage for growth, nutrition, and cognitive development, yet millions of Indian parents especially those from low-income and rural backgrounds—struggle to access timely, reliable, and understandable childcare information. While government health programs and grassroots workers (like ASHAs and ANMs) play an important role, gaps still exist in awareness, accessibility, and follow-through.

As a result, issues such as missed vaccinations, preventable diseases, poor nutrition practices, and delayed developmental milestone recognition remain widespread. These challenges are further compounded by limited literacy, language barriers, and the growing problem of misinformation circulating through informal media channels.

Key Challenges

1. **Language and Literacy Barriers:** Many parents cannot fully access health resources due to limited literacy or lack of materials in their regional language. Traditional apps and websites often fail to deliver information inclusively.
2. **Fragmented and Static Information Sources**: Parents rely on scattered sources health workers, neighbors, or social media that may be outdated, contradictory, or inaccurate. Current solutions rarely personalize guidance to the child's age or family's context.
3. **Missed Preventive Care**: Critical health milestones such as immunizations, nutritional interventions, and routine checkups are often overlooked because parents lack timely reminders and awareness of schedules.
4. **Limited Access to Local Healthcare**: Even when parents seek professional help, many remain unaware of nearby Primary Health Centres (PHCs) or ASHA workers who provide free or affordable care. Lack of easy navigation and directory access worsens this gap.
5. **Trust and Privacy Concerns**: Parents may hesitate to use digital tools due to concerns about how family or child data are stored and shared, especially when it involves sensitive health records.

1.2 MOTIVATION

The motivation for developing ChAlid comes from the need to provide reliable childcare support during the critical early years of child development. Many parents in low-income and rural communities lack access to trustworthy, clear, and timely information on health, nutrition, and milestones. Missed vaccinations, poor nutrition practices, and reliance on misinformation lead to preventable illnesses and long-term setbacks.

ChaIld aims to close this gap by offering a multilingual, easy-to-use tool that gives parents personalized guidance, secure health tracking, and timely reminders. By empowering families with accurate information and simple access to local healthcare resources, ChAlid reduces preventable risks, improves early childhood outcomes, and builds trust in digital health support.

2. OBJECTIVE

This project aims to develop ChAlid, a multilingual and user-friendly childcare support system that helps parents track their child's health, growth, and vaccinations while providing personalized guidance, reliable information, and easy access to local healthcare services.

3 REQUIREMENT ANALYSIS AND SPECIFICATION

3.1 Functional Requirements

1. **Baby Profile Management:**
   - i. Allow parents to create and manage individual profiles for each child.
   - ii. Store health details such as date of birth, weight, vaccination history, and growth milestones securely.
2. **Multilingual AI Chatbot:**
   - i. Provide personalized childcare advice and health guidance in multiple regional languages.
   - ii. Answer queries using a curated knowledge base aligned with trusted healthcare sources.
3. **Vaccination and Health Reminders:**
   - i. Send timely alerts for upcoming vaccinations, checkups, and important health milestones.
   - ii. Deliver reminders in the parent's preferred language via simple, easy-to-understand notifications.
4. **Article and Resource Library:**
   - i. Provide access to curated, multilingual articles on nutrition, parenting, and common childcare practices.
   - ii. Enable personalized recommendations based on the child's age and health profile.
5. **Healthcare Locator:**
   - i. Integrate with GIS mapping to identify nearby Primary Health Centres (PHCs) and ASHA workers.
   - ii. Provide directions and contact details in local languages.
6. **Privacy and Security:**
   - i. Ensure secure storage of all profiles and medical data with encryption.
   - ii. Allow users full control over their information with privacy-by-design features.

3.2 Non Functional Requirements

1. **Performance:** The system should deliver responses quickly, ideally within a few seconds, to ensure a smooth user experience.
2. **Usability:** The interface must be simple, intuitive, and easy to navigate for users of varying technical skills.
3. **Explainability:** Provide clear and understandable explanations of results to help users grasp why specific content is flagged or recommended..

Technical Requirements

1. **Programming Language**: Python for implementing core functionalities, AI integrations, and backend services.
2. **Web/Mobile Framework**: Django or Node.js/Express for backend APIs, and React Native for a mobile-friendly, cross-platform application.
3. **AI Models**: Integration with large language models (e.g., Google Gemma, OpenAI GPT) for multilingual chatbot and personalized guidance.
4. **Vector Database**: Pinecone, Qdrant, or FAISS for semantic search, content recommendations, and efficient knowledge retrieval.
5. **Structured Database**: Firebase or Amazon DynamoDB for secure storage of baby profiles, health records, reminders, and article content.
6. **Cloud Services**: AWS or GCP for scalable deployment, data management, and hosting AI services.
7. **GIS Integration**: Google Maps API or OpenStreetMap services for PHC/ASHA healthcare center mapping.
8. **Security Frameworks**: Encryption protocols, OTP-based authentication, and role-based access control to ensure privacy and data security.

3.3 Software& Hardware Requirements

1. Hardware Required:

Name of Components	Specifications
Processor	Intel Core i3 or higher
RAM	8GB or higher
Storage	500GB HDD OR SSD
Operating System	Windows 10,11

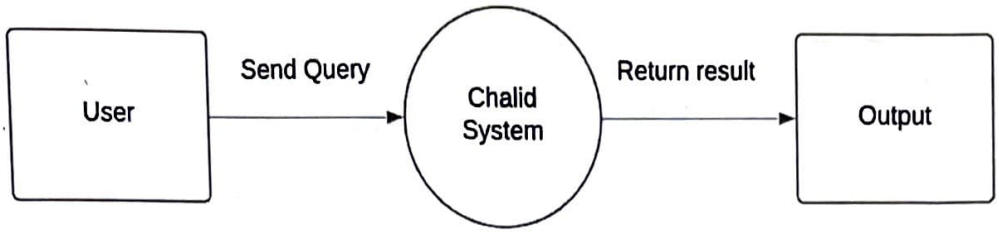
2. Software Required

Name of Components	Specifications
Frontend	React Native / React.js
IDE	VS Code
Browser	Google Chrome, Microsoft Edge
Database	Firebase
AI Service	OpenAI GPT
GIS Integration	Google Maps API / OpenStreetMap

4. SYSTEM DESIGN

System design of **ChAlid** using a Data Flow Diagram (DFD):

Level 0:



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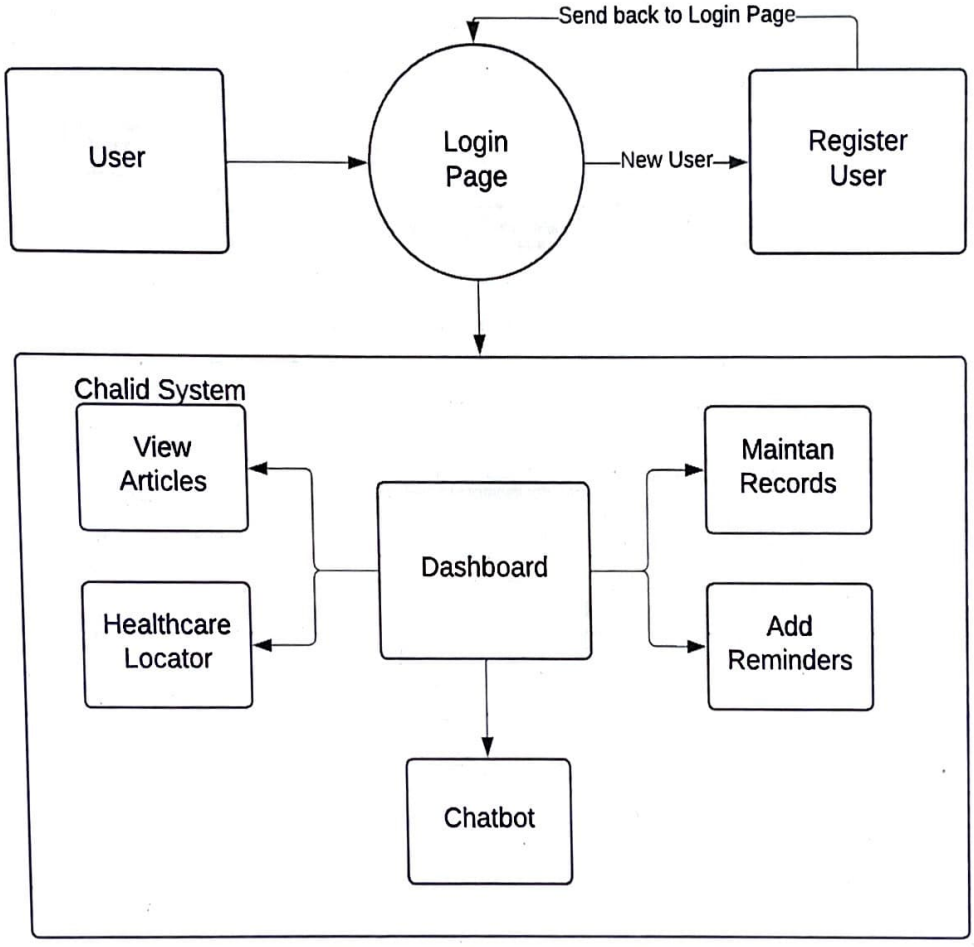

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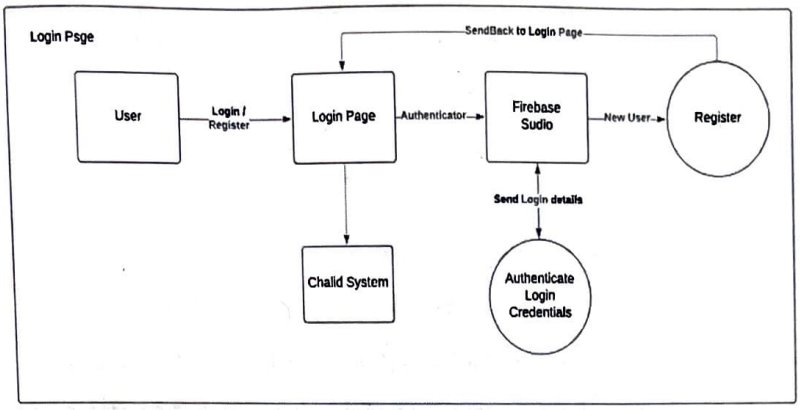
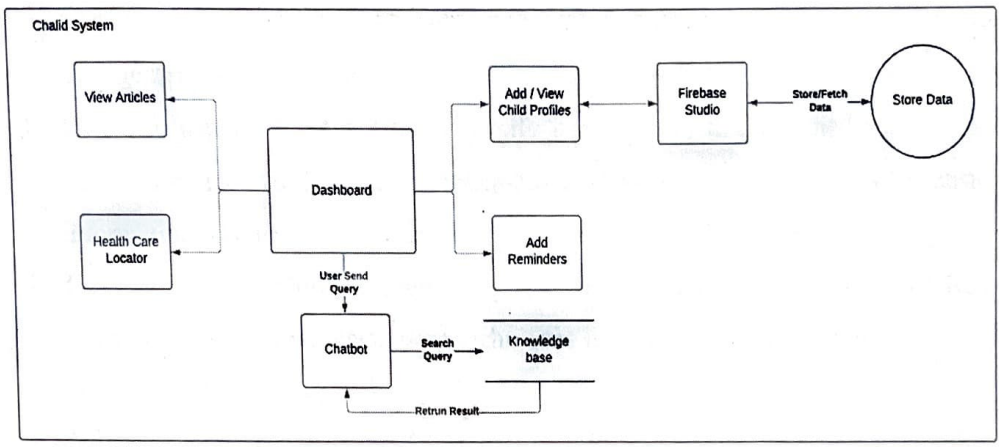

Login Psge
SendBack to Login Page
User
Login / Register
Login Page
Authenticator
Firebase Sudio
New User
Register
Send Login details
Chalid System
Authenticate Login Credentials


Chalid System
View Articles
Add / View Child Profiles
Firebase Studio
Store/Fetch Data
Store Data
Dashboard
Health Care Locator
Add Reminders
User Send Query
Chatbot
Search Query
Knowledge base
Retrun Result

5. ALGORITHMS USED

For the ChAlid project, several algorithms and techniques can be applied to enable multilingual support, personalization, and AI-driven healthcare assistance. Some of the key approaches are:

1. **Natural Language Processing (NLP) with Transformer Models**: Use large language models like Google Gemma or GPT to power the multilingual chatbot, enabling accurate translation, question answering, and personalized childcare advice.
2. **CRUD Algorithms**: Manage Create, Read, Update, and Delete operations for handling child profiles and health records, ensuring consistent and secure data management within the app.
3. **User Authentication Algorithms**: Verify user identity through methods like OTP verification, password login, and token-based sessions to protect access to sensitive information and maintain privacy.
4. **Geospatial Algorithms**: Process geographic data to locate nearby Primary Health Centres and ASHA workers, using techniques like the Haversine formula to calculate and rank distances accurately.
5. **Data Encryption and Security Algorithms**: Protect sensitive data by encrypting it with methods such as AES and SSL/TLS, securing health records and login details against unauthorized access.

6. MILESTONE

Sr. No.	Project Activity	Estimated Start Date	Estimated End Date
1.	Project Allotment	20/07/2025	02/08/2025
2.	Synopsis Creation	03/08/2025	10/08/2025
3.	Project Synopsis Presentation	13/08/2025	24/08/2025
4.	Frontend Development	10/08/2025	10/09/2025
5.	Backend Development	10/09/2025	20/10/2025
6.	Integration and Testing	20/10/2025	10/11/2025
7.	Documentation	10/08/2025	02/10/2025
8.	Final Presentation	17/11/2025	10/12/2025

7. MEETING WITH SUPERVISOR

Date of the meeting	Mode	Comments by the supervisor	Signature of the supervisor
14/07/2025	Offline	Discussion about the topic of the project.	
01/07/2025	Offline	Finalised Project	
07/08/2025	Offline	Discussed review paper	
11/08/2025	Offline	Synopsis review	

8. REFRENCES

[1] https://lucid.app/