Team Details

a. **Team name:** CodeKheti.ai
b. **Team leader name:** Farhat
c. **Problem statement:** *#4 - Providing farmers with expert help on demand*

The Problem - A Day in Rohan's Life

🌱 **Meet Rohan** - A young farmer in rural Karnataka

His Daily Struggles:

- Strange yellow spots on tomato leaves - Is it fungus? Pest? Wrong fertilizer?
- Market prices fluctuate wildly - When to sell for maximum profit?
- Government subsidies exist but are complex to navigate
- Information scattered, not in native Kannada
- Local agricultural office miles away - Time is money

The Reality: 600M+ farmers in India face similar challenges daily

Our Solution - Project Kisan

🚀 **"Your Personal Agronomist in Your Pocket"**

An AI-powered multi-agent system that acts as:

- **Personal Agronomist** - Instant crop disease diagnosis
- **Market Analyst** - Real-time price intelligence
- **Government Navigator** - Scheme guidance and applications
- **Voice Assistant** - Native language interaction

Vision: Transform every smartphone into an agricultural expert system

Market Opportunity

📈 Massive Market Impact

Market Size:

- 600M+ farmers in India
- $370B agricultural market size
- 43% crop loss due to diseases annually
- 86% farmers lack timely expert advice
- $2.5B lost annually due to poor market timing

Digital Penetration:

- 750M+ smartphone users in rural India
- 65% farmers use smartphones daily
- Only 12% have access to agricultural apps

How We're Different

🎯 Unique Differentiators

Existing Solutions:

❌ Single-purpose apps (only weather/prices)

❌ English-only interfaces

❌ Generic advice without local context

❌ No real-time expert consultation

Project Kisan:

✅ Multi-agent AI system - Complete farming assistant

✅ Voice-first in local languages (Kannada + 10 more)

✅ Hyper-local recommendations based on soil/climate

✅ Real-time expert-level diagnosis and advice

✅ Integrated government scheme navigation

✅ Offline first architecture

Problem-Solving Approach

🔧 How We Solve Core Problems

1. Instant Diagnosis

- Photo → AI Analysis → Actionable Treatment
- 95% accuracy using Gemini multimodal
- On Demand specialist opinion

2. Market Intelligence

- Real-time price data + AI trend analysis
- Optimal selling time recommendations, smart notifications

3. Government Schemes

- Natural language queries → Personalized guidance
- Direct application links and eligibility checks

4. Accessibility

- Voice-first interaction in **native languages** using Vertex AI Speech APIs
- Works on basic smartphones with minimal data

Unique Selling Proposition (USP)

💎 What Makes Us Special

"The First Multi-Agent AI System for Comprehensive Farm Management"

🧠 Multi-Agent Intelligence

- **5 specialized AI agents** working in harmony
- Context-aware conversations across domains

🗣️ Voice-First Design

- Overcoming literacy barriers
- Natural conversation in local dialects

🎯 Hyper-Personalization

- Soil-specific recommendations
- Weather-adjusted advice
- Local market integration

⚡ Real-Time Action

- Instant disease identification
- Live market price updates
- Government scheme eligibility in seconds

Feature List

🛠️ Core Features

Crop Health Management:

- Photo-based disease/pest identification
- Treatment recommendations with local availability
- Preventive care scheduling
- Crop rotation guidance

Market Intelligence:

- Real-time commodity prices
- Price trend analysis and predictions
- Optimal selling time recommendations
- Transportation cost optimization

Government Schemes:

- Natural language scheme search
- Eligibility verification
- Application assistance
- Document requirements checklist

Feature List (continued)

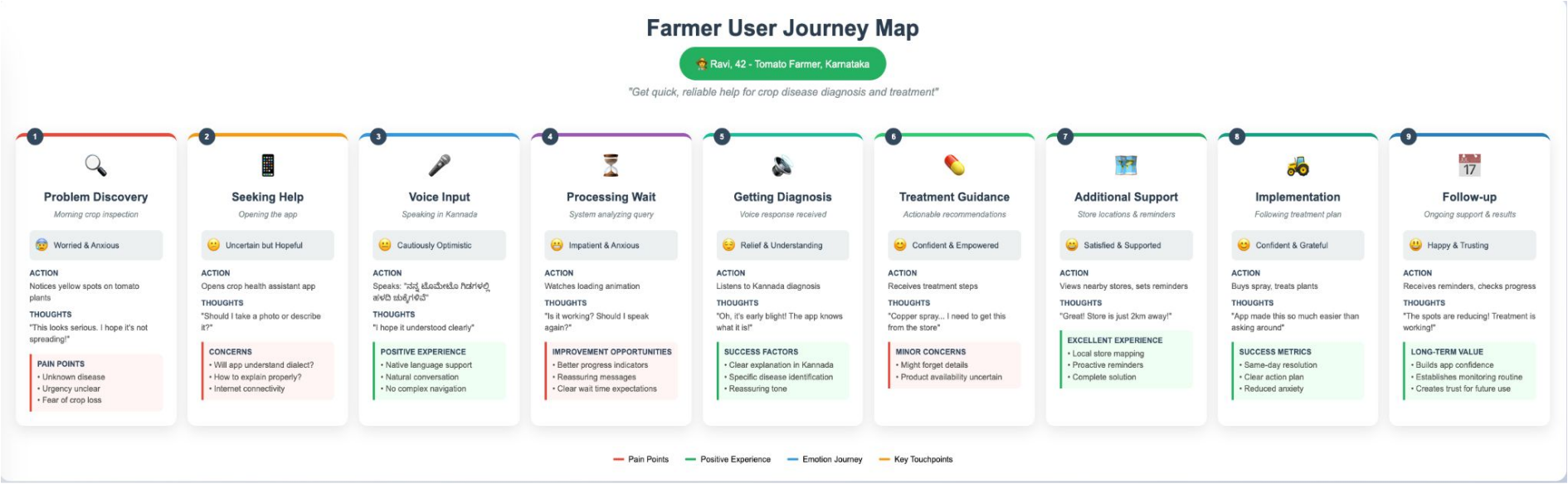
Voice Interaction:

- Kannada speech recognition
- Voice-based queries and responses
- Offline capability for basic features
- Multi-modal interaction (text + voice + image)

Offline first architecture

- Works without internet - Core features always available
- Smart synchronization - Updates when connected
- Local data storage - Firebase offline capabilities
- Progressive enhancement - Better experience online

User Journey



Technology Stack

🔧 Google Cloud Native Architecture

Core AI Platform:

- Vertex AI Agent Builder - Multi-agent orchestration
- Gemini 2.0 Flash - Multimodal reasoning
- Vertex AI Speech APIs - STT/TTS

Data & Storage:

- Cloud Storage - Image processing
- BigQuery - Market data analytics
- Firestore - User profiles & history

Deployment:

- Firebase Studio - Mobile deployment (Special Prize)
- Cloud Functions - Real-time data processing
- Cloud Run - Scalable API services

Technology Stack (continued)

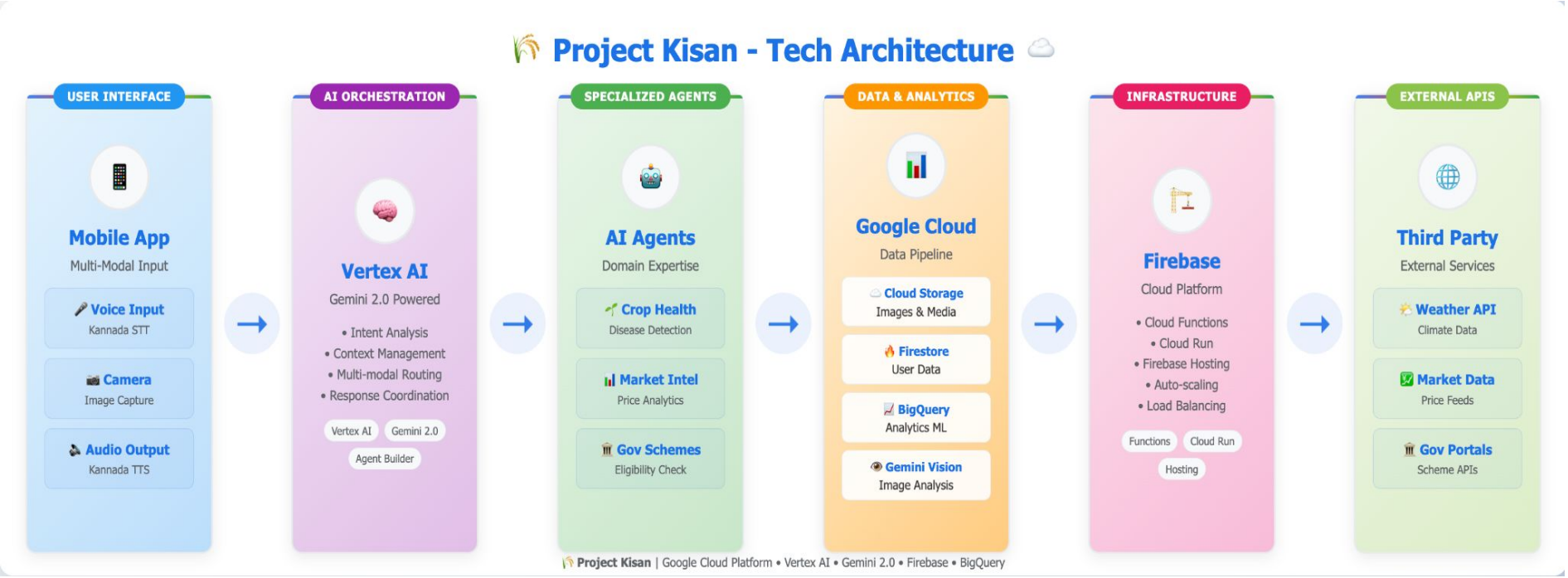
Integration:

- Market APIs - Real-time commodity prices
- Government APIs - Scheme data
- Weather APIs - Climate context

Offline-First Architecture (Mobile App Terminology):

- Local Database (SQLite / Room / Core Data): Stores data offline for fast access.
- Smart Sync Engine: Syncs local changes to cloud when online, handles conflicts.
- Real time Sync (Firebase / Couchbase / Realm): Keeps local and remote data in sync automatically.
- Installable Offline App (PWA / Flutter / React Native): Works without internet across devices.
- Network-aware Sync: Detects connectivity to schedule or defer sync tasks.

Architecture Diagram



Success Metrics

📈 How We Measure Impact

Technical Metrics:

- 95%+ accuracy in disease identification
- <3 second response time
- 99.9% uptime for critical features

Business Metrics:

- 30% reduction in crop loss
- 25% increase in farmer income
- 50% faster decision making

User Experience:

- 90%+ farmer satisfaction
- 10,000+ active users in first 6 months
- 85% user retention rate

Technical Deep Dive

🔬 AI Agent Specifications

Crop Diagnosis Agent:

- Gemini 2.0 Flash for image analysis
- 50,000+ labeled crop disease images
- Integration with local pesticide databases

Market Analysis Agent:

- Real-time API integration with 15+ mandis
- BigQuery ML for price prediction
- Transportation cost optimization

Government Scheme Agent:

- NLP processing of 500+ government schemes
- Eligibility matching algorithms
- Direct integration with application portals

Social Impact

🌍 **Beyond Technology - Real Impact**

Farmer Empowerment:

- Equal access to expert knowledge
- Reduced dependency on middlemen
- Increased crop yield and income

Economic Impact:

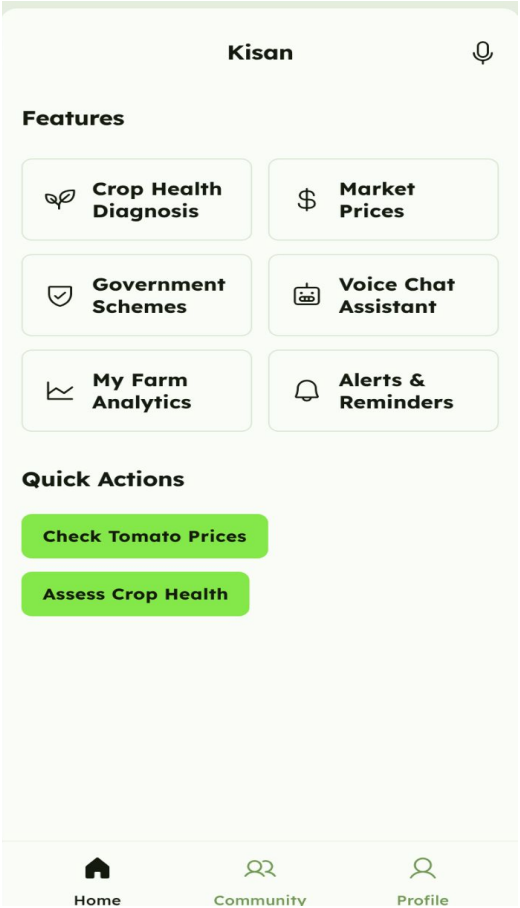
- $500M+ potential savings in crop losses
- 20% increase in farmer income
- Rural job creation in tech support

Environmental Benefits:

- Reduced pesticide overuse
- Data-driven sustainable farming
- Climate-smart agriculture practices

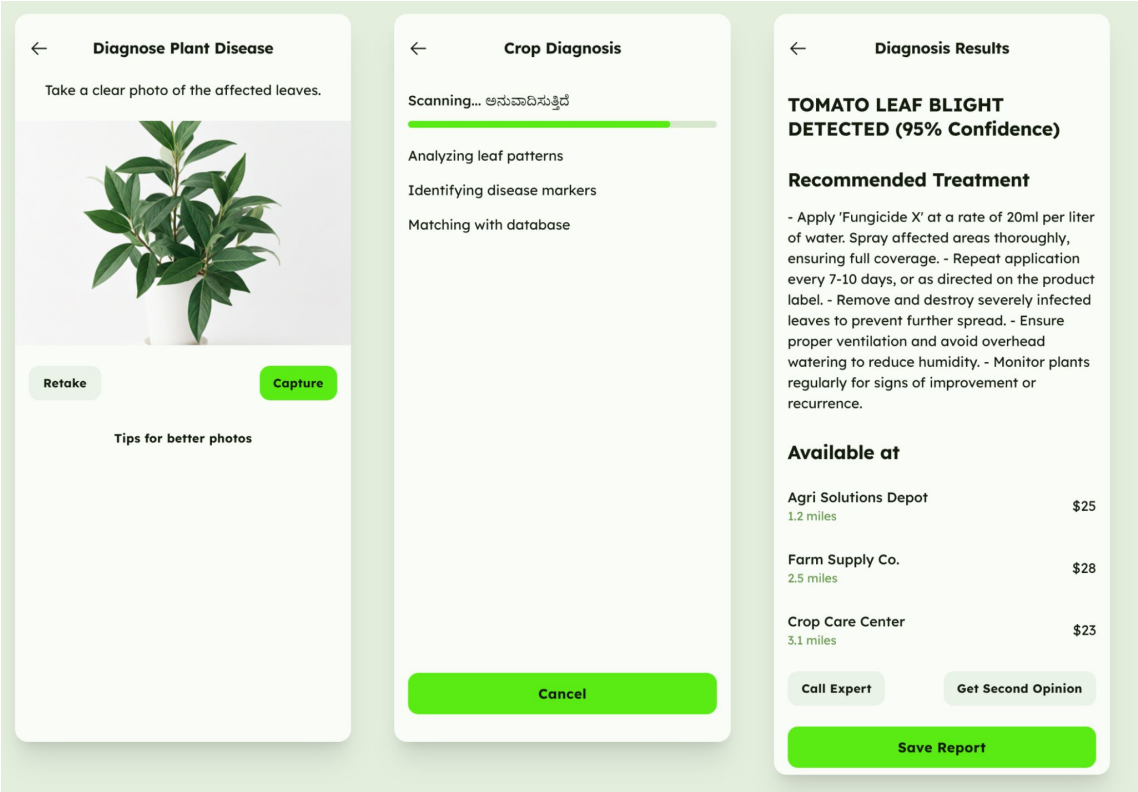
Wireframes/Mock Diagrams

- **Home Screen Mock UI**



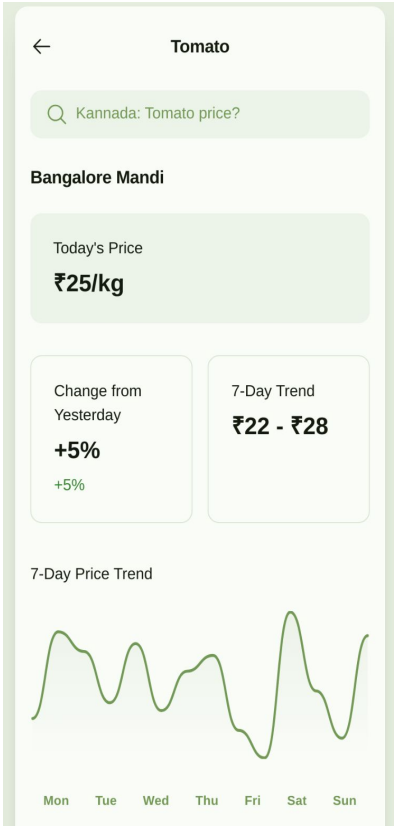
Wireframes/Mock Diagrams (continued)

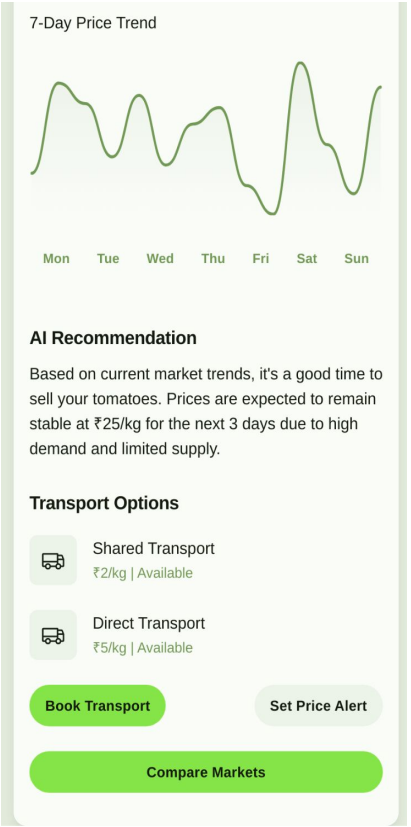
- **Crop Diagnosis Flow Mock UI**



Wireframes/Mock Diagrams (continued)

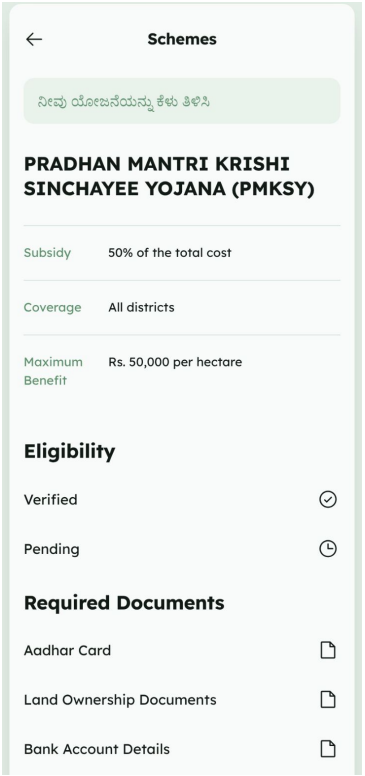
- **Market Intelligence Screen Mock UI**

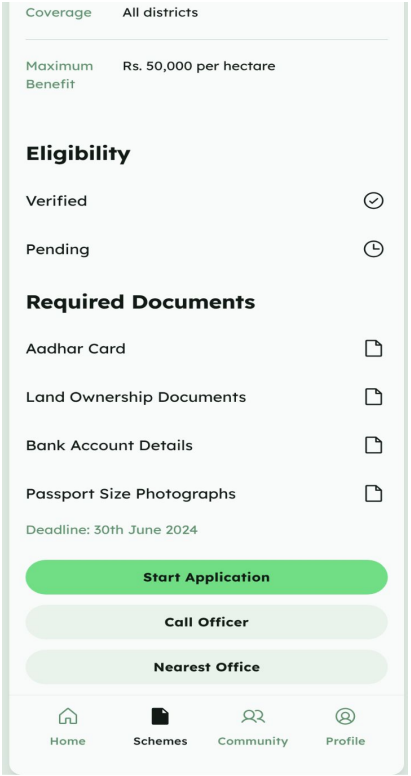




Wireframes/Mock Diagrams (continued)

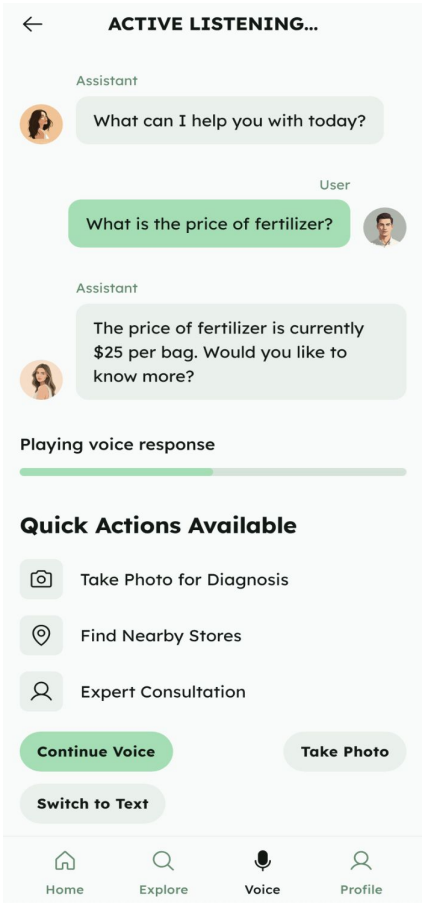
- **Government Scheme Navigator Mock UI**





Wireframes/Mock Diagrams (continued)

- **Voice Assistant Interface Mock UI**



Call to Action

🚀 **Ready to Transform Indian Agriculture**

Why Choose Project Kisan:

✅ Real problem with massive impact

✅ Cutting-edge Google Cloud technology

✅ Voice-first design for accessibility

✅ Multi-agent AI system showcasing ADK

✅ Firebase Studio deployment (Special Prize)

Join us in empowering 600M+ farmers with AI!

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Thank you!