AI for Bharat Hackathon

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Team Name : Ether

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Problem Statement : Build an AI powered solution that supports rural ecosystems, sustainability or resource – efficient systems.

Brief about the Idea:

The Problem: ₹1.5 Lakh Crore Annual Loss

Indian farmers lose ₹1.5 lakh crore worth of produce annually due to post-harvest inefficiencies and lack of market access.

Key Statistics:

- 86% of farmers 120 million are small/marginal holders with zero bargaining power

- Farmers lose 4060% of value to intermediaries

- Post-harvest losses: 48% cereals, 515% fruits & vegetables

- 60% farmers have no formal credit access → forced to sell immediately at low prices

The Real Problem: When a farmer harvests, the local trader is often the only buyer accessible within 24 hours.Trader offers ₹12/kg while fair price is ₹16/kg. But farmer needs immediate cash and has noalternatives.

What Farmers Actually Need:

Not more price information apps. They need multiple competing buyers + instant payment.

The Solution: FarmFast

AI-powered instant marketplace that connects farmers with multiple buyers within 1 hour viaWhatsApp.

Core Value: Farmer lists produce → Gets 3+ competitive offers → Selects best → Gets paid

How different is it from any of the other existing ideas?

Existing Solutions:
- NaPanta, AgroStar → Provide price info but no buyer connections
- E-mandis → Require physical transport with upfront costs
- Advisory apps → Give information but don't create market access

FarmFast is Different:
- ✓ Instant buyer matching - 1020 buyers compete for your produce
- ✓ AI quality grading - Objective A/B/C grade builds trust
- ✓ WhatsApp-first - No app download, works on feature phones
- ✓ Payment escrow - Guaranteed same-day payment
- ✓ Free for farmers - Buyers pay 2% commission

How will it be able to solve the problem?

For Framers:
- ✓ Competitive bidding eliminates single-buyer exploitation
- ✓ Quality grading helps negotiate fair prices
- ✓ Instant payment eliminates distress selling
- ✓ Voice interface works for illiterate users

For Buyers:
- ✓ Quality-graded produce reduces wastage risk
- ✓ Direct sourcing saves 20-30% vs mandi
- ✓ Faster procurement (no travel to mandis)

Impact:
- ✓ 15-20% farmer income increase
- ✓ 5% post-harvest loss reduction = ₹7,500 crore saved
- ✓ Reaches 120 million small/marginal farmers

USP of the proposed solution:
Only platform combining AI quality grading + instant buyer matching + same-day payment escrow in a WhatsApp-first interface for illiterate farmers.

List of features offered by solution

1. Voice-First WhatsApp Interface
- List produce via voice note in Hindi/Marathi/Telugu/Tamil/Kannada
- No typing or reading required
- Works on feature phones with 2G connectivity

2. AI Quality Grading
- Photo → A/B/C grade based on color, defects, uniformity
- Farmer understands produce value objectively
- Reduces buyer-seller disputes

3. Instant Buyer Broadcast 5-minute reach
- Listing sent to 1020 nearby buyers (traders, FPOs, restaurants)
- Geospatial matching within 20km radius
- Push notifications to buyer apps

4. Competitive Bidding
- Multiple buyers submit offers
- Farmer sees all offers ranked by price
- Voice comparison: "First offer ₹16/kg is 25% above local rate"

5. Secure Escrow Payment
- Buyer pays via UPI before pickup
- Platform holds payment until handover confirmed
- Released to farmer within 30 seconds
- Zero payment defaults

6. Quality-Based Pricing Intelligence
- Shows fair price range based on grade
- "Your B-grade tomatoes worth ₹14.16/kg today"
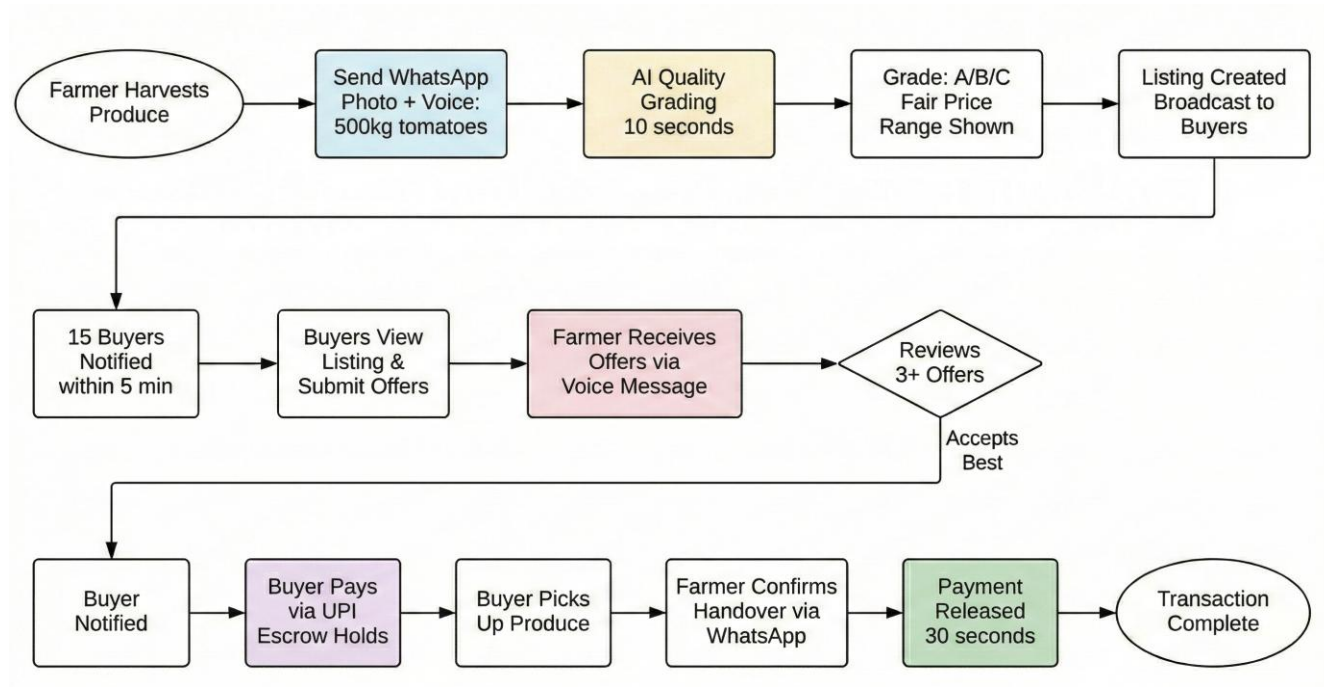- Updated daily from mandi data + platform transactions

7. Buyer Dashboard
- Browse active listings with quality grades
- Filter by crop, grade, distance, quantity
- Submit offers, track pickups

8. Transaction History
- Track all sales: date, buyer, price, quantity
- Compare earnings vs local trader rates
- Learn seasonal patterns and reliable buyers

Process flow diagram

Key Metrics

First Offer – 30 minutes

Minimum Offers – 2 to 3 within an hour

Payment Speed – 30s after handover

Payment Success Rate - 100% (escrow-guarantee)
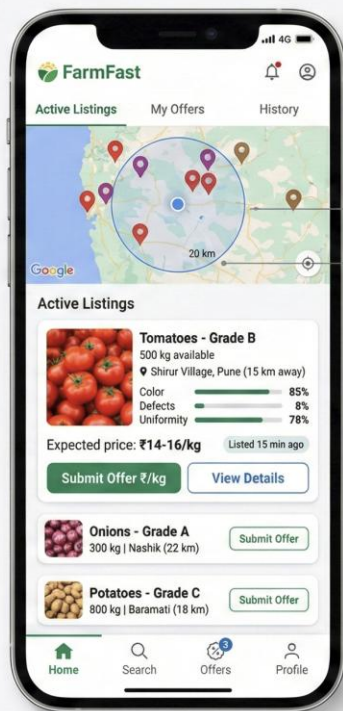
Mock UI of the proposed solution
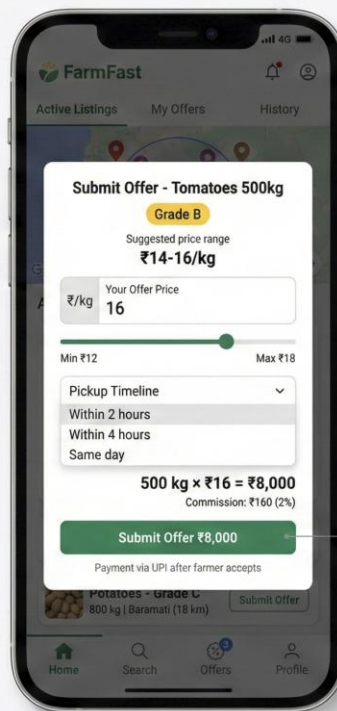
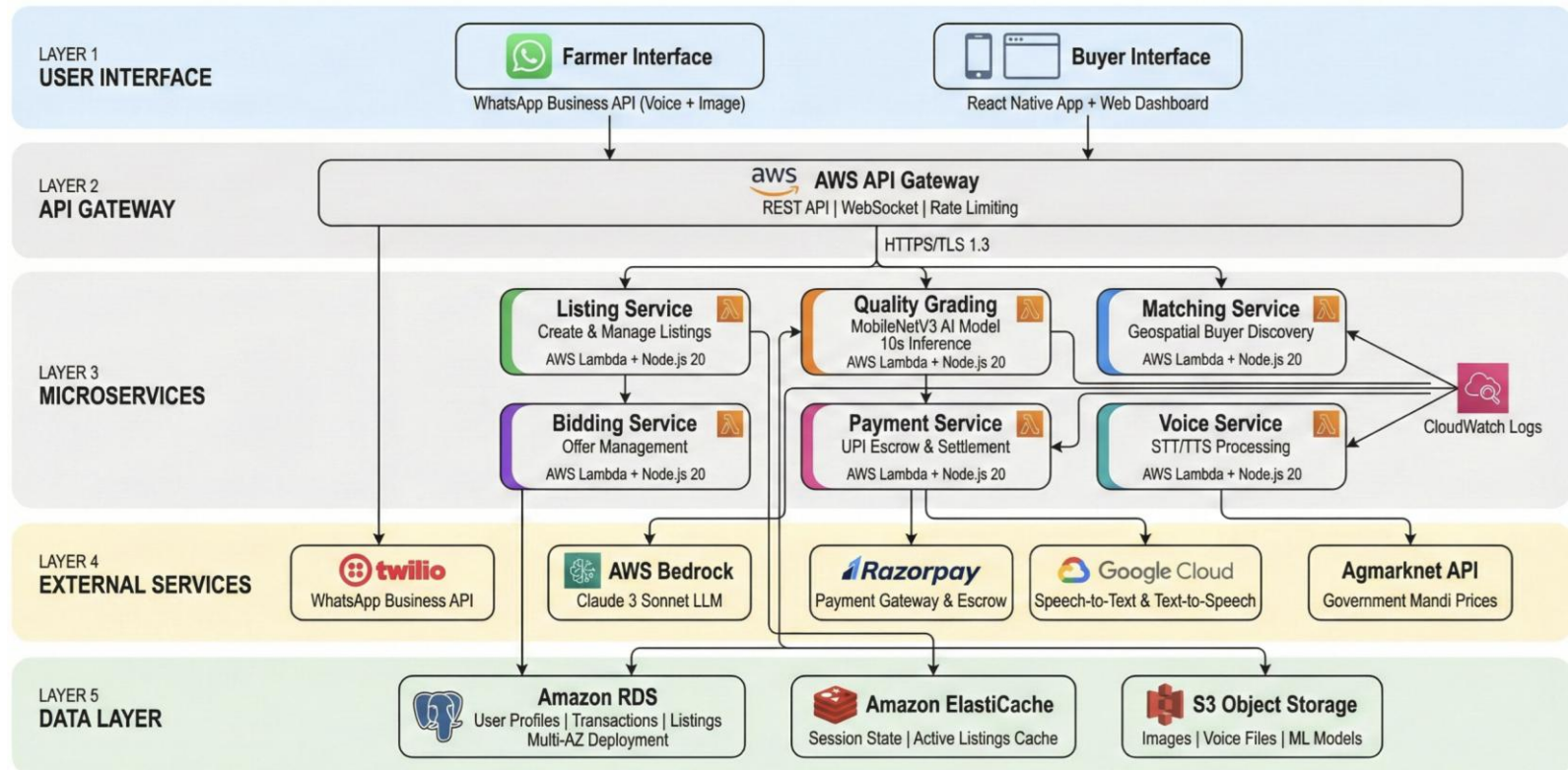**Design Principles**

Voice-first

Button Based Actions

Regional Languages

Works on 2G Networks

Architecture diagram of the proposed solution:

Technologies to be used in the solution:

Layer	Technology	Purpose
Frontend	React Native	Buyer mobile app (Android)
	React 18 + TypeScript	Buyer web dashboard
Backend	AWS Lambda (Node.js 20)	Serverless microservices
	AWS API Gateway	API routing, rate limiting
	PostgreSQL 15 (RDS)	Transaction data, user profiles
	Redis (ElastiCache)	Session cache, active listings
	AWS S3	Image storage, ML models
AI/ML	MobileNetV3 (TensorFlow)	Quality grading model
	AWS Bedrock Claude	LLM advisory generation
	Google Cloud Speech	STT/TTS (5 languages)
Communication	Twilio WhatsApp Business API	Farmer interface
Payments	Razorpay	UPI escrow, settlements
Monitoring	AWS CloudWatch	Logs, metrics, alerts
DevOps	GitHub Actions	CI/CD pipeline

Estimated implementation cost :

Category	Monthly	Annual
AWS Infrastructure		
Lambda + API Gateway	₹5,000	₹60,000
RDS PostgreSQL	₹8,000	₹96,000
S3 + ElastiCache + CloudFront	₹7,000	₹84,000
External Services		
Twilio WhatsApp	₹20,000	₹2,40,000
AWS Bedrock (LLM)	₹8,000	₹96,000
Google Speech API	₹5,000	₹60,000
Razorpay	₹3,000	₹36,000
Team		
2 Engineers + 1 Operations	₹1,30,000	₹15,60,000
Total	**₹1,86,000**	**₹22,32,000**

Overall Impact

Social Impact

- Farmer Income:
- 15-20% income increase per transaction
- Additional ₹8,000-12,000 annual income per farmer
- 120 million farmers = ₹12 lakh crore wealth transfer over 5 years

Food Security:

- 5% post-harvest loss reduction = ₹7,500 crore saved annually
- 12 million tons more food reaches consumers
- Feeds 25 million additional people

Financial Inclusion:

- Reduces dependence on 30-40% interest informal loans
- Saves ₹3,000-5,000 per farmer annually in interest

Environmental:

- Reduced food waste = Lower carbon footprint
- Optimized transport logistics
- Incentivizes quality over quantity

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Thank You