



**KARPAGAM**  
ACADEMY OF HIGHER EDUCATION  
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# HACKSPRINT 2.0



**Team Name: MasterMinds**

**Domain: Agrotech**

**Category: Software**

**Project Title: Fair Grain - Empowering Millet Farmers with Fair  
Prices and Direct Buyers**



## **"Digital platforms to connect millet farmers with buyers for fair pricing"**

Why do millet farmers, despite months of hard work, still struggle to get fair prices and timely payments for their crops? The absence of transparent pricing, scientific quality assessment, and direct access to buyers forces farmers to depend on middlemen, while buyers lack reliable ways to source quality millets. This creates a need for a digital platform that uses ML-based quality scoring and secure payment mechanisms to build trust and ensure fairness for both farmers and buyers.

# Proposed Solution

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**Trusted Digital Marketplace** – A transparent platform enabling farmers to directly trade millets with buyers, ensuring fair value for their labor.

**FPO-Led Quality Assurance** – Authorized field officers validate crop quality physically, safeguarding farmers from undervaluation and maintaining buyer confidence.

**Fair Price Engine** – Computes dynamic pricing using Cost of Production (CoP), official MSP benchmarks, and verified quality scores to ensure equitable earnings.

**Smart Demand Matching** – Aggregates and matches buyer orders with the highest-quality available produce, optimizing supply-chain efficiency.

**ImageSecure Escrow Payments** – Implements advance and escrow-based digital transactions, guaranteeing timely payouts and reducing financial stress for farmers. recognition for plant disease and pest detection

**Verified User Ecosystem** – Onboarding authenticated farmers and buyers to minimize middlemen and build trust.

# Technical Description



## Technologies used

**Programming languages :** Dart

**Backend :** Firebase


**frameworks :** Flutter

**libraries :** Material UI

**ML Training :** Python

### Farmer Dashboard

Manage your millet listings, track bids, and monitor earnings

 Add New Listing

Active Listings

**12**

↑ +3 this week vs last month



Pending Bids

**28**

↑ +8 today vs last month



Completed Sales

**47**

↑ +5 this month vs last month



Total Earnings

**₹3.2L**

↑ +12% growth vs last month



### Barnyard Millet (Sanwa) - Organic Certified

 Vijay Singh 

Quantity

**90 Q**

Moisture

**12.3%**

Harvest


25/11/2024

Location

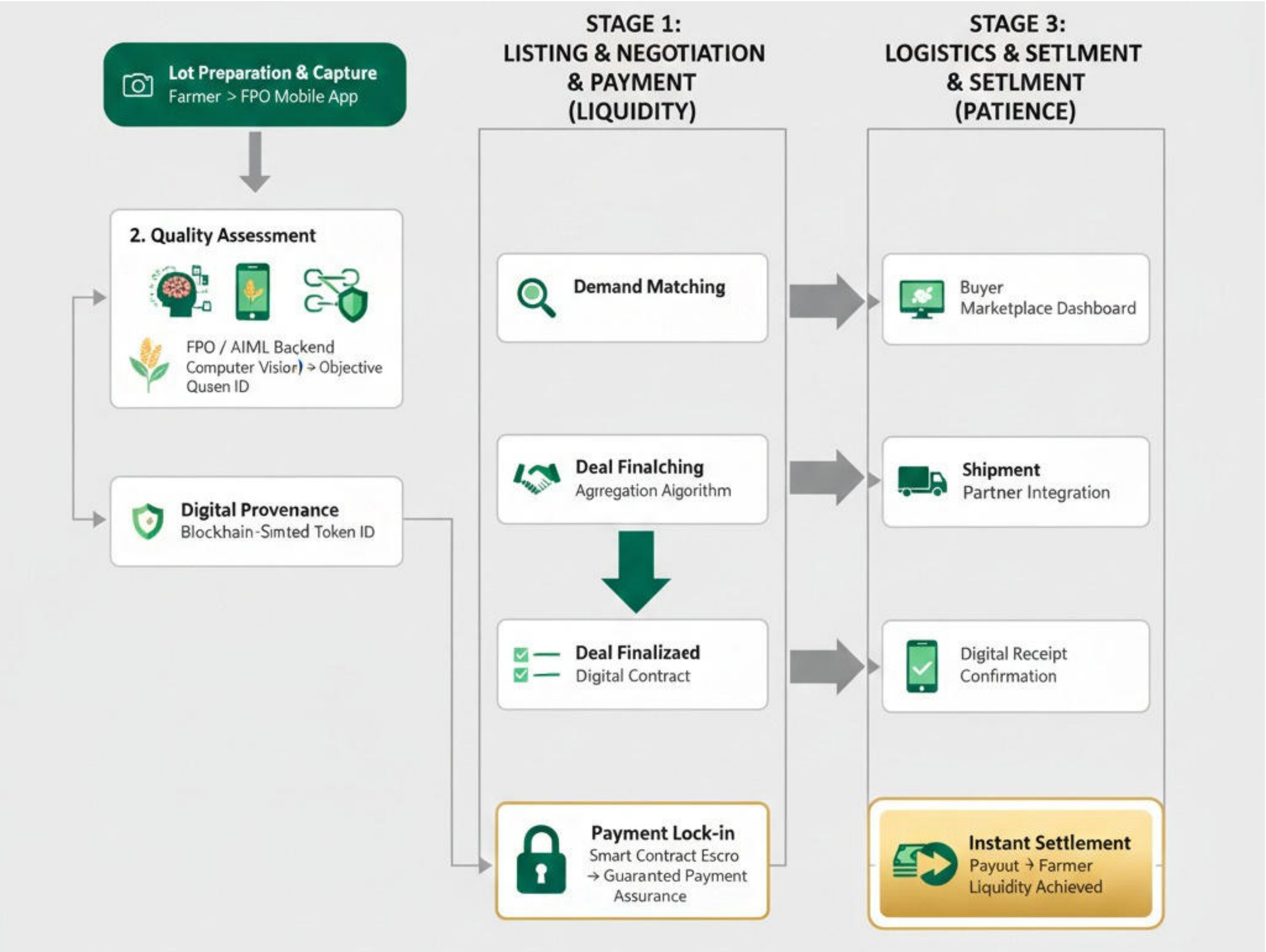
Shimla, Himachal Pradesh

Price

**₹3,400** /Quintal

 Buy Now

# Flowchart



# Impact & Benefits

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## **Dual-Layer Quality Verification (Tech + Human)**

Combines farmer-uploaded data with FPO physical inspection, ensuring accurate, tamper-proof quality grading — something most platforms don't do.

## **Fair Price Engine (CoP + MSP + Quality Score)**

Instead of random pricing or bidding, your system calculates a scientific, transparent fair price using Cost of Production, MSP benchmarks, and verified quality score.

## **Smart Demand Matching Algorithm**

Automatically maps buyer demand → best-quality farmer lots, reducing mismatch, wastage, and time — making procurement highly efficient.

## **Secure Payments With Advance + Escrow**

Farmers get guaranteed, stress-free payouts through advance and escrow-based settlement, building trust and financial security.

## **Voice Assistant + Multilingual Support**

Farmers can use the app through voice commands in their own regional language, making it highly accessible to non-tech-savvy users — a major differentiator.

# Feasibility & Viability

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**Technical:** Can be built with standard web/mobile frameworks; integrates payments and FPO quality checks.

**Operational:** Uses FPOs for crop verification; adoption by farmers and buyers is practical.

**Financial:** Moderate development cost; revenue from transaction fees or subscriptions.

**Scalability:** Platform can expand to more crops and regions easily.

**Market:** High demand for verified millet; farmers seek direct-market solutions.

**Economic:** Fair pricing ensures better farmer income; buyers get reliable supply.

**Social & Environmental:** Reduces wastage, builds trust, and promotes sustainable trade.

**Long-term Impact:** Strengthens farmer-buyer ecosystem and ensures continuous adoption.

# Competitor Analysis



Category	Existing Platforms (e-NAM, AgriBazaar, DeHaat, Ninjacart)	Our Solution
Quality Verification	<ul style="list-style-type: none"><li>• Mostly photo/manual checks; limited grading accuracy.</li></ul>	<ul style="list-style-type: none"><li>• Dual-layer (farmer + FPO physical verification).</li></ul>
Pricing	<ul style="list-style-type: none"><li>• Market-driven / bidding-based; inconsistent fairness.</li></ul>	<ul style="list-style-type: none"><li>• Fair Price Engine (CoP + MSP + Quality Score).</li></ul>
Matching	<ul style="list-style-type: none"><li>• Buyers search manually; no smart allocation.</li></ul>	<ul style="list-style-type: none"><li>• Smart automated demand → quality-based matching.</li></ul>
Payment	<ul style="list-style-type: none"><li>• Often delayed; no escrow.</li></ul>	<ul style="list-style-type: none"><li>• Advance + Escrow secure payouts.</li></ul>
Accessibility	<ul style="list-style-type: none"><li>• Mostly text apps; limited regional language.</li></ul>	<ul style="list-style-type: none"><li>• Voice assistant + multilingual UI.</li></ul>

## **ESTIMATED DEVELOPMENT COST** (INDIA MARKET)

- If built by Freelancer / Small Team

Module	Cost (₹)
• UI Design (Buyer + Farmer)	8,000 – 12,000
• Flutter App Development	20,000 – 30,000
• Firebase Integration	5,000 – 8,000
• Cloudinary Image Upload	3,000 – 5,000
• Testing & Bug Fixes	4,000 – 6,000
 <b>TOTAL (MVP):</b>  <b>₹40,000 – ₹60,000</b>	

# Team Name: Master Minds

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