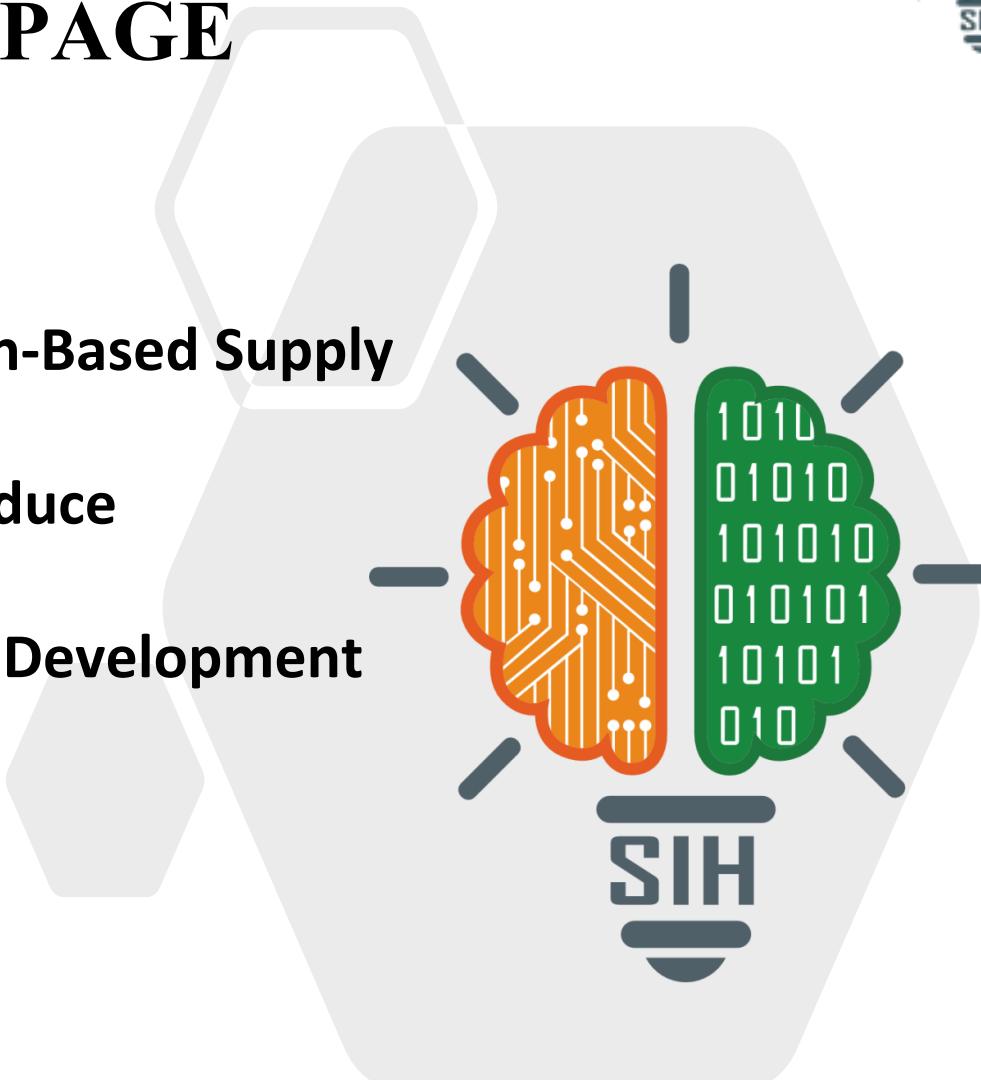


SMART INDIA HACKATHON 2025



TITLE PAGE

- **Problem Statement ID – SIH25045**
- **Problem Statement Title - Blockchain-Based Supply Chain Transparency for Agricultural Produce**
- **Theme- Agriculture, FoodTech & Rural Development**
- **PS Category- Software**
- **Team ID-**
- **Team Name (Registered on portal)- YOLO**



Proposed Solution:

- QR-coded Blockchain ID for Crop Tracking** → Farmers give crop information at harvest through a mobile app, and the blockchain gives each batch a unique ID.
- Record Every Transaction** → Farm → distributor → retailer → consumer.
- End-to-End Tracking** → Every handover (farmer → distributor → retailer → consumer) is logged on blockchain.
- Real-Time Monitoring** → Govt/NGOs monitor supply chain, detect fraud, and enforce fair trade instantly.
- QR for Consumers** → Consumers scan the QR with a mobile app to see the crops farm origin, harvest date, quality, and full supply history.



How It Solves the Problem:

- Fair Prices** → Farmers get fair earnings, no middlemen cheating
- Transparency** → QR codes show where the crop comes from, price, and quality
- Price Control** → Smart contracts keep retail fair price no Extra charge from customer .
- Monitoring** → Govt and NGOs can watch the whole supply chain

Unique Value:

- Trusted System** → Blockchain + Smart Contracts + QR Codes track crops
- Fair Pricing** → Smart contracts prevent overcharging
- Honest Retailers** → Reputation & penalties ensure integrity
- Easy & Low-Cost** → Works on smartphones, kiosks, or cloud so easy to implement .
- Full Traceability** → QR codes show origin, price & quality



TECHNICAL APPROACH



Technology:

1 Programming & Frameworks

- Solidity → Smart contracts
- React.js → Frontend & backend
- Kotlin & XML → Mobile App
- Oracle → Real-time market prices

2 Blockchain & Smart Contracts

- Ethereum → Track crops & enforce prices
- Tamper-proof blockchain ledger
- Payment via smart contract escrow
- Transparent crop traceability

Farmer Adds Crop Details in App:

- ✓ Enter crop type, quantity, quality, base price, and farm location.
- ✓ Information stored safely on blockchain Unique ID.

Distributor Updates Transfer:

- ✓ Records crop movement from farm to warehouse or market
- ✓ Verified automatically each step smart by contract.

Retailer proposes selling price:

- ✓ Smart contract checks against government-set base price + allowed profit margin.
- ✓ Approves only fair prices, No overcharging.

Methodology:

Consumer Checks Crop via QR Code

- ✓ Scan QR to see origin, crop history price, and quality
- ✓ Ensures full transparency and trust with safer.

Real-Time Monitoring by Govt / NGOs

- ✓ Track full supply chain live
- ✓ Ensure government-set prices & profit margins
- ✓ Detect fraud instantly
- ✓ Maintain accountability & transparency



FEASIBILITY AND VIABILITY



Feasibility

- **Practical & Low Cost** → Uses blockchain on cloud no heavy setup needed.
- **Easy Adoption** → Farmers, retailers, and consumers only need a smartphone + QR code.
- **Secure & Transparent** → Blockchain makes data tamper-proof, building trust .
- **Scalable** → Can start small in one mandi and expand to national level smoothly .
- **Supports Policy** → Govt can set fair price rules directly in smart contracts.

Challenges

- Low internet access in villages.
- Farmers & retailers need digital awareness.
- Data security & trust issues.

Overcoming Strategies

- Offline mode + lightweight apps for rural use.
- Training & awareness programs for farmers by Govt and NGO
- Strong blockchain encryption → tamper-proof & secure.



IMPACT AND BENEFITS



Impact:

Farmers:

- Fair income
- Removed Broker
- Better market access.

Consumers:

- Fair price
- Verified quality
- Safe Food.

Retailers:

- Honest trade
- Improved Brand reputation
- Easy compliance
- Increase sell.

Government/NGOs:

- Real-time monitoring
- Enforce fair pricing
- Policy support.

- Improves transparency & accountability
- Reduces fraud and errors
- Speeds up supply chain operations
- Encourages vendor & farmer accountability

Benefits of the Solution:

Social: Builds trust, empowers farmers, protects consumers

Economic: Fair pricing, higher farmer income, reduced wastage

Environmental: Promotes sustainable supply chain, reduces overproduction



RESEARCH AND REFERENCES



1. **Blockchain in Agriculture** – [A survey on evaluation of blockchain-based agricultural traceability – ScienceDirect](#)
2. **Smart Contracts for Supply Chain** – [\(PDF\) Smart Contracts for Transparent and Efficient Agricultural Supply Chain Management](#)
3. **Market Trends** – [Blockchain in Agriculture and Food Supply Chain Market | Global Market Analysis Report – 2035](#)
4. **Transparency & Sustainability** - [Improving traceability and sustainability in the agri-food industry through blockchain technology: A bibliometric approach, benefits and challenges - ScienceDirect](#)
5. **Adoption & Govt Role** – Government policy ensures fair pricing & monitoring; drives adoption Anser Press.
6. **Blockchain and Smart Contracts** - [\(PDF\) Blockchain and smart contracts for secure and transparent transactions](#)
7. **Secure and Efficient Financial Transactions**– [\(PDF\) Blockchain-Based Smart Contracts for Secure and Efficient Financial Transactions in Digital Banking](#)
8. **Blockchain for Supply Chain Transparency**– [\(PDF\) Blockchain for Supply Chain Transparency and Logistics Optimization](#)
9. **Secure and Transparent Financial Transactions** – [\(PDF\) Blockchain Technology for Secure and Transparent Financial Transactions](#)