

# SUMMARY OF THE PROJECT

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# METHODOLOGY AND WORKING

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- **Food Entry into Blockchain:**

- Stakeholders (farmers, processors, distributors) input food data (e.g., origin, quality, processing) into a blockchain system.

- **Immutable Record Creation:**

- Once the data is entered, it is recorded in blocks. Each block is timestamped and linked to the previous block, ensuring immutability.

- **Smart Contract Execution:**

- Smart contracts ensure that specific rules (e.g., proper storage conditions) are enforced by automatically validating and executing transactions.

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### •**Blockchain for Transparency:**

- Consumers can scan QR codes to access the full traceability of the product, including its origin, handling conditions, and certifications, ensuring transparency.

### •**Data Query and Validation Using Python:**

- Python scripts can be used to query the blockchain for food data. For example, fetching product details using the Ethereum network and smart contracts.

### **Consumer Access and Transparency:**

- Develop a web or mobile application that consumers can use to scan QR codes or use RFID/NFC to access the full journey of the food.

- Blockchain ensures that the data displayed is tamper-proof and transparent.

- **Choose a Blockchain Platform:**

- Use a blockchain framework like **Hyperledger Fabric**, **Ethereum**, or **Binance Smart Chain** for building a decentralized ledger.
- Python libraries like **web3.py** for Ethereum can be used to interact with blockchain nodes.

- **Smart Contract Development:**

- Create smart contracts to define how food data is added, verified, and queried. Smart contracts ensure the integrity of the data added to the blockchain.
- Use **Solidity** (for Ethereum) to write the smart contract.





- **Data Collection and Upload:**

- Each stakeholder will input food-related data (e.g., production date, location, certifications) to the blockchain through an interface (API or web app).
- Sensors and IoT devices can be integrated to automatically update the blockchain with environmental conditions like temperature, humidity, etc.

- **Consensus Mechanism:**

- Implement a consensus algorithm like **Proof of Work (PoW)**, **Proof of Stake (PoS)**, or **Practical Byzantine Fault Tolerance (PBFT)** to validate transactions on the blockchain.
- For private blockchains, PBFT is generally more efficient for food traceability use cases.

