



SaffronTrace

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Elevator Pitch



Saffron is a spice derived from a flower, which is then collected and dried to use as a seasoning and coloring agent in food

Asian countries are the largest consumers of saffron, and also largely produced in Asian countries; with Iran responsible for 45% of global saffron production

Saffron had a USD 372.9 Million market valuation in the year 2021. This valuation is said to increase to USD 756.7 Million by 2030

Some of the major known issues with trading saffron are the adulteration of saffron and varied packaging regulations



Elevator Pitch

"Introducing SaffronTrace, the groundbreaking solution that revolutionizes the saffron industry through innovative blockchain-based traceability."

We aim to reduce the previously mentioned issues by establishing a blockchain network for trading saffron in the market

We will be doing this by enabling each package of saffron tagged with a unique identifier which will display the important information about the saffron like its origin, quality, and certificate of authenticity

This can be accessed by consumers, thus improving their confidence with regard to the quality and authenticity of the saffron when buying



Problem Statement



One of the major issues with trading saffron in the market is the adulteration in the saffron that is sold

Other problems include counterfeiting, synthetic products mixed with saffron, packaging problems, varying international standards, and lack of specialized marketing to name a few

Saffron producers also struggle to differentiate their genuine products from fraudulent ones

Saffron is the most expensive spice in the world, such fraudulent cases can lead to unsatisfied and disappointed consumers leading to lower sales



Problem Scenario

Saffron is sold in bulk in exports and then packaged as per regional regulations and requirements

The exports are in large packages which are then repackaged leading to quality issues and mixtures

It also lacks a good promotion and marketing strategy, which also affects the knowledge and sales of the product

Adulteration of saffron is widespread in the market due to the lack of certifications and standardizations resulting in quality degradations



Solution Statement

To tackle this problem, we have come up with microchip-enabled packaging for trading saffron

The package will be embedded with microchips that would enable real-time traceability through a mobile application

This will help us to combat counterfeiting and make sure the sold products are authentic

Also help us with package traceability and authenticity and quality assurance

We aim to collaborate with producers, distributors, and retailers to implement this technology



Solution Scenario

With the help of our product, we help with the major issue faced with saffron trading which is traceability

Saffron would be packaged as per the regulations with each package embedded with a microchip for real-time traceability, which will help reduce the complications faced by saffron trading

The saffron producers will inspect the saffron and pack them with our microchip-enabled packages

The data of this will be with them and us to be accessed anytime and hence would lead to a secure supply chain system of saffron reducing the adulteration and opaque supply chain issues dealt



Current Scenario

Saffron tracing it refers to tracking its origin, production, and distribution to ensure its quality, authenticity, and adherence to regulations.

In the present scenario, saffron is being traced by some of the following methods:

Geographic Origin Identification: Tracing the geographic origin of saffron means figuring out the specific region or country where it was produced. This is important because different regions have their own environmental conditions, soil types, and cultivation methods that can affect the quality and unique characteristics of saffron

Certification and Labelling: Saffron producers and exporters obtain certifications that guarantee traceability and authenticate saffron from specific regions renowned for their production, such as Kashmir or Spain, enabling consumers to trace the origin of saffron for quality assurance.

Supply Chain Auditing: Companies and regulatory bodies conduct supply chain audits to track saffron's journey from the farm to the market. These audits ensure compliance, identify risks and address any gaps in traceability by assessing practices at each stage, from cultivation to packaging and transportation.



Drawbacks

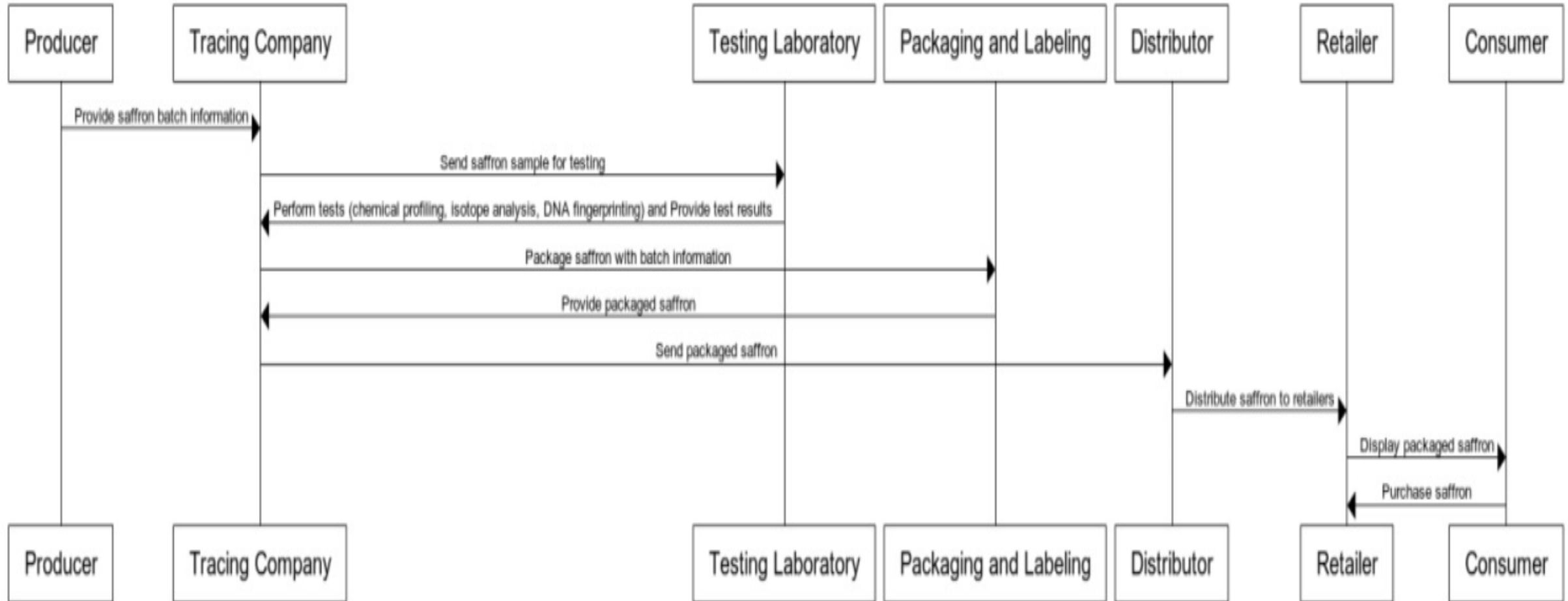
Lack of Standardization: There is a lack of standardized protocols and practices for saffron tracing across the industry. This can lead to inconsistencies in tracing methodologies, making establishing a uniform and reliable traceability system difficult.

Limited Adoption: Saffron tracing practices are not universally adopted by all producers and companies in the saffron industry. This can result in gaps in traceability, making it challenging to track saffron throughout the supply chain and ensure its authenticity.

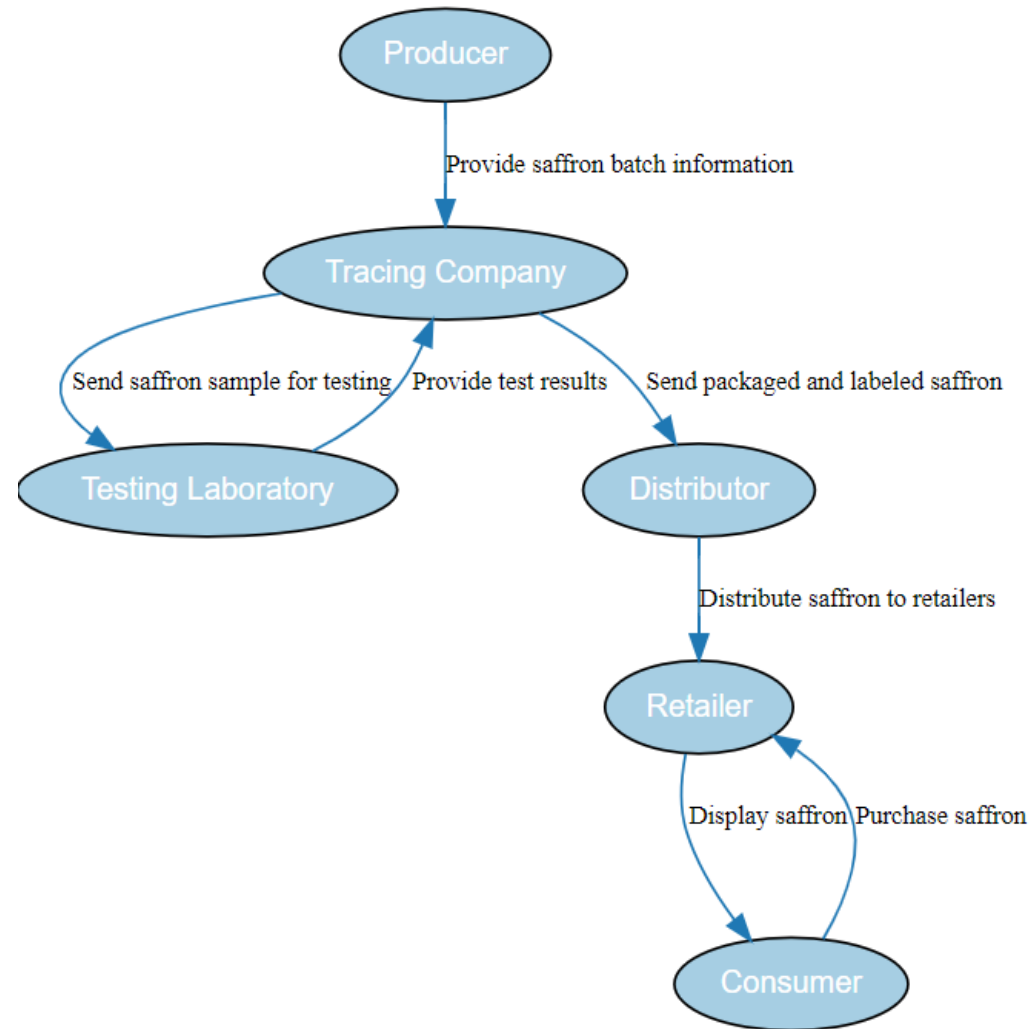
Vulnerability to Fraud: Despite tracing efforts, the saffron market still faces challenges related to fraud and adulteration. Counterfeit saffron can be introduced into the supply chain, and inaccurate labeling or misrepresentation of saffron's geographic origin can occur. This compromises the reliability and accuracy of saffron tracing efforts.



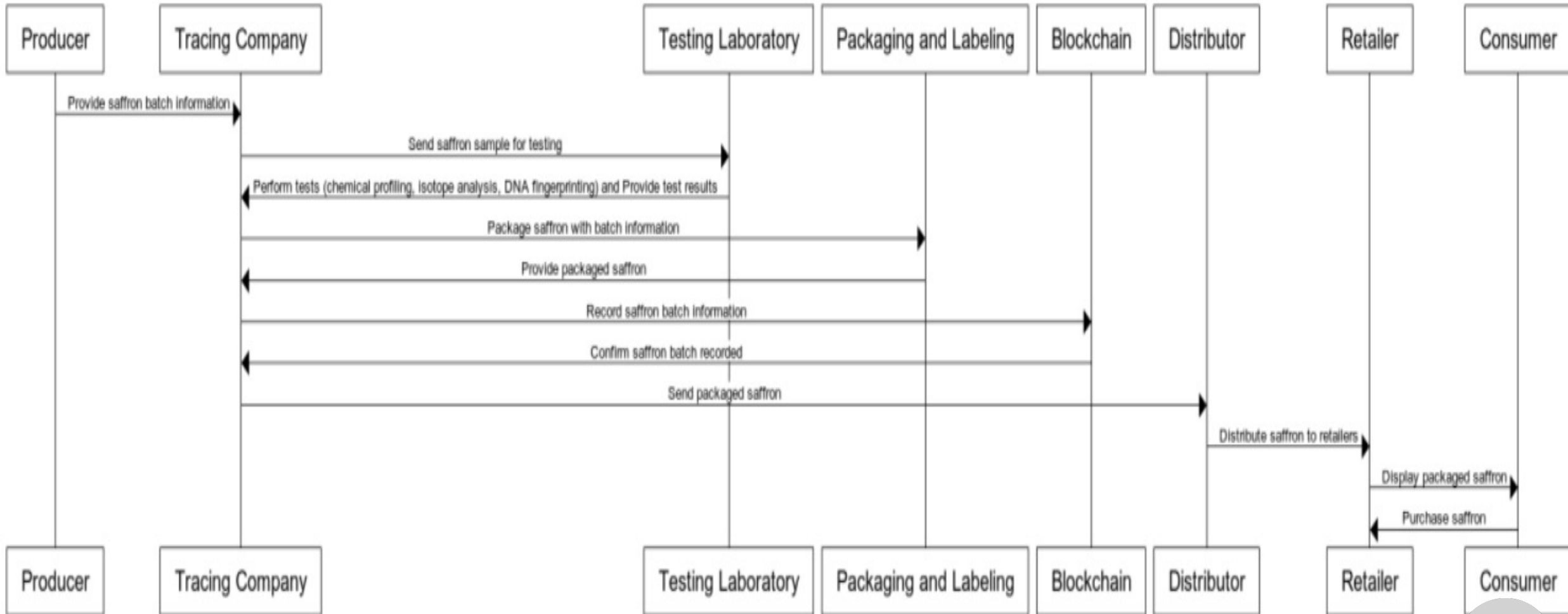
Sequence Diagram- Current Scenario



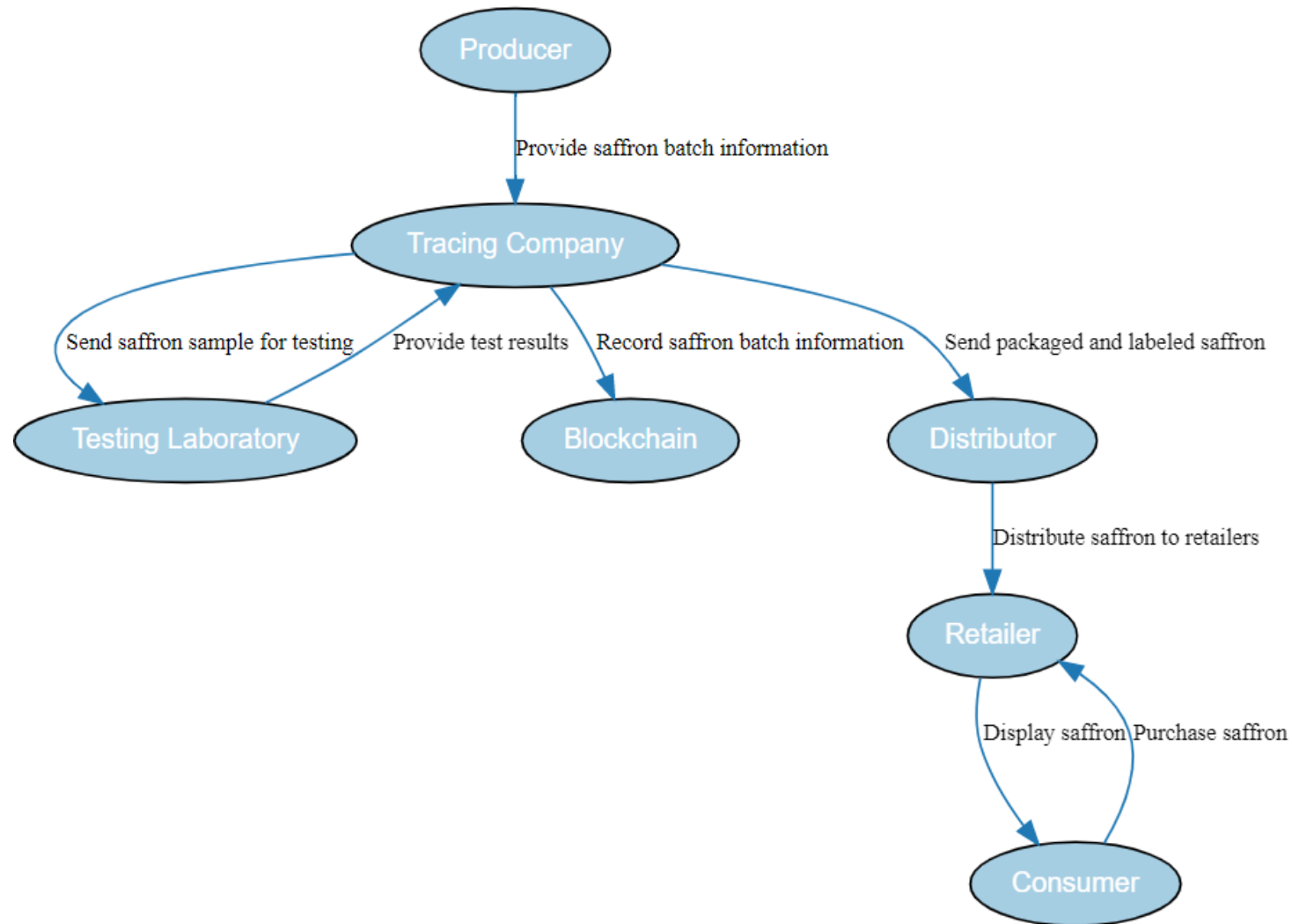
Structure Diagram – Current Scenario



Sequence Diagram - Solution Scenario



Structure Diagram – Solution Scenario



Alternate Solution 1: **Cloud based approach**

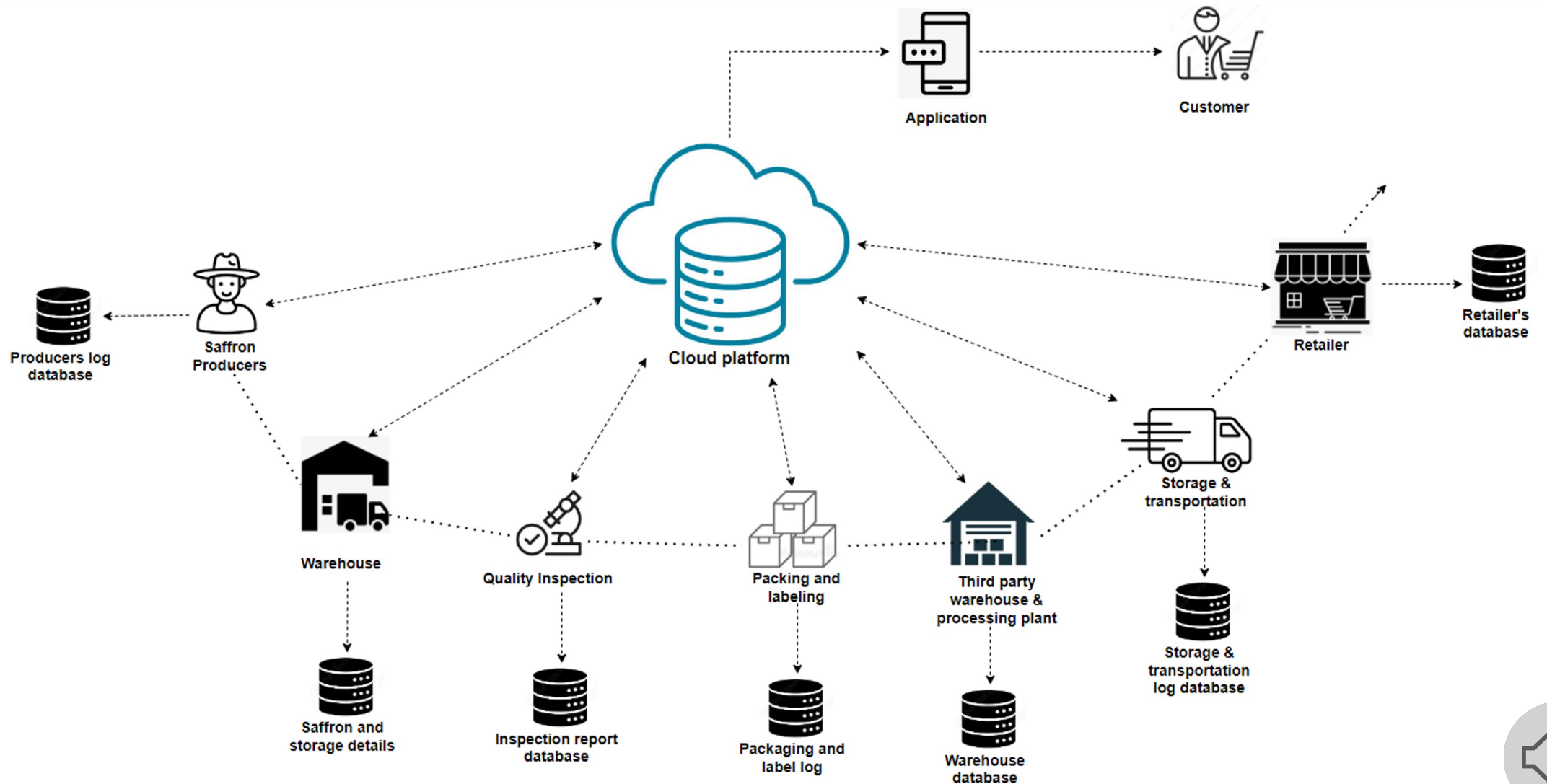
All the individual entities like the producers, warehouse, transportation, retailers, etc. can update the information on their databases which is connected and stored into the main cloud platform

Any updates or changes made in the databases will be reflected on the cloud platform

Cloud server can then send the updates to the customer which can be reflected on the mobile application, and customers can track relevant details of saffron



Cloud based approach- Structure Diagram



Drawbacks of Cloud based approach

Security issue may arise as the data on the cloud platform is accessible to various entities



Human errors (eg.: entering incorrect data in the database)

Data may be in different format for various databases. Hence, data transformation and management will be time consuming



Cost and maintenance of cloud architecture



Alternate Solution 2: Traceability using AI & Real-time monitoring

Data collection from Producers and Manufactures can be done in a predefined format. AI can be used for data collection which will help to speed up the process

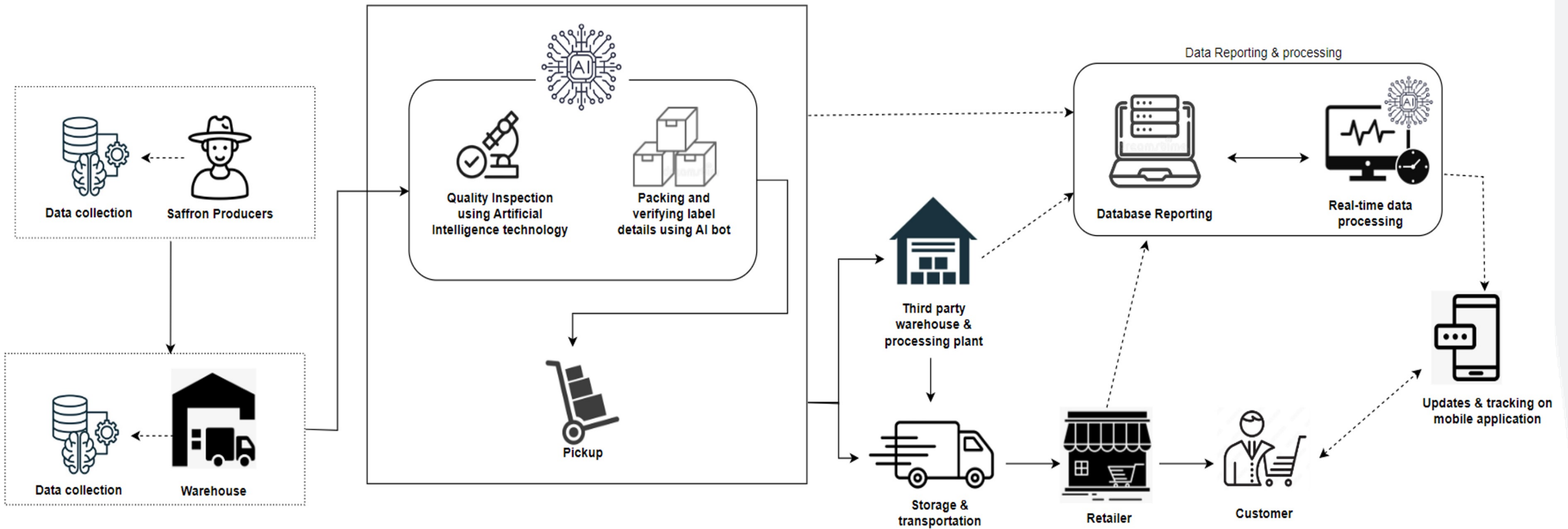
Using AI, the quality inspection of Saffron can be done which can help in removing anomalies and can ensure food safety. The AI model can be implemented to verify the packaging and labeling details

Similarly, the data from third party warehouse, storage & transportation, and retailers can be collected

The data of all entities is updated on the main server and real-time analysis of Saffron can be visible on the mobile application which can be accessed by the customer



Traceability using AI & Real-time monitoring - Structure Diagram



Drawbacks of Traceability using AI & Real-time Monitoring

If the AI models/software are not well-trained, it may produce irrelevant data



Software security issues

High cost for implementing robust AI models



Technological Aspects

Blockchain Technology	Microchip-enabled Technology	Mobile application Technology
<p>It is core technology required to establish a decentralized and transparent network for trading saffron</p> <p>Provides an immutable record of all transactions and interactions with the saffron, ensuring its authenticity and quality.</p>	<p>Each package of saffron will be embedded with a microchip.</p> <p>The data collected from the microchip will be used to update the blockchain network in real-time.</p> <p>This will enable the stakeholders to track the saffron's journey.</p>	<p>A mobile application that can communicate with the microchip technology embedded in the saffron package is required.</p> <p>This will enable real-time traceability and provide consumers with access to important information about the saffron they are purchasing</p>



Technological Aspects (for alternate solutions)

Cloud-based approach

- Cloud-based technology can provide a centralized platform
- The data is stored and managed to be collected from the microchip-enabled saffron packaging
- This technology will enable all stakeholders in the saffron trading supply chain to access and update relevant data in real time

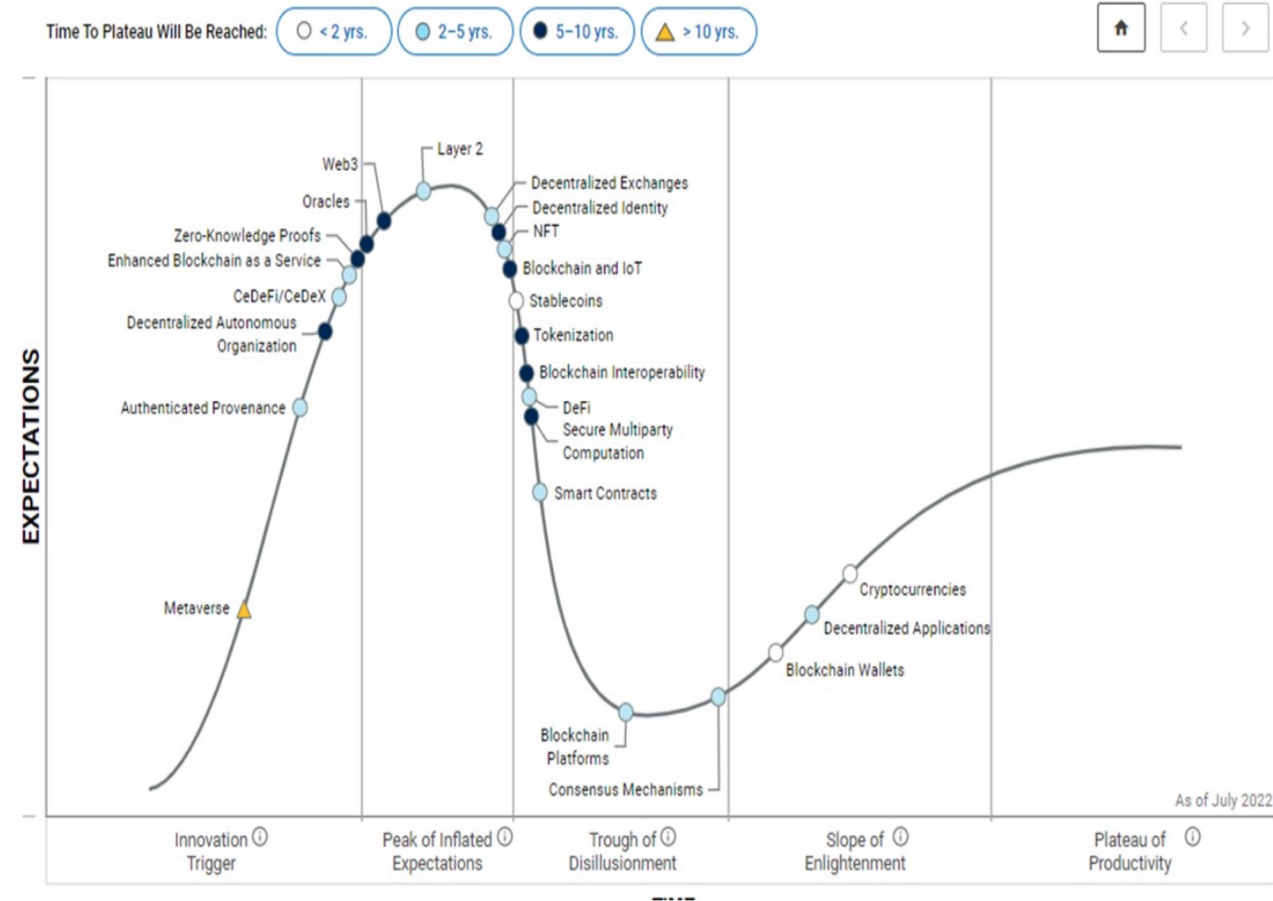
AI technology

- AI technology to automate data collection, quality inspection, and verification of packaging and labeling details.
- This technology will help to speed up the process of saffron trading and ensure food safety



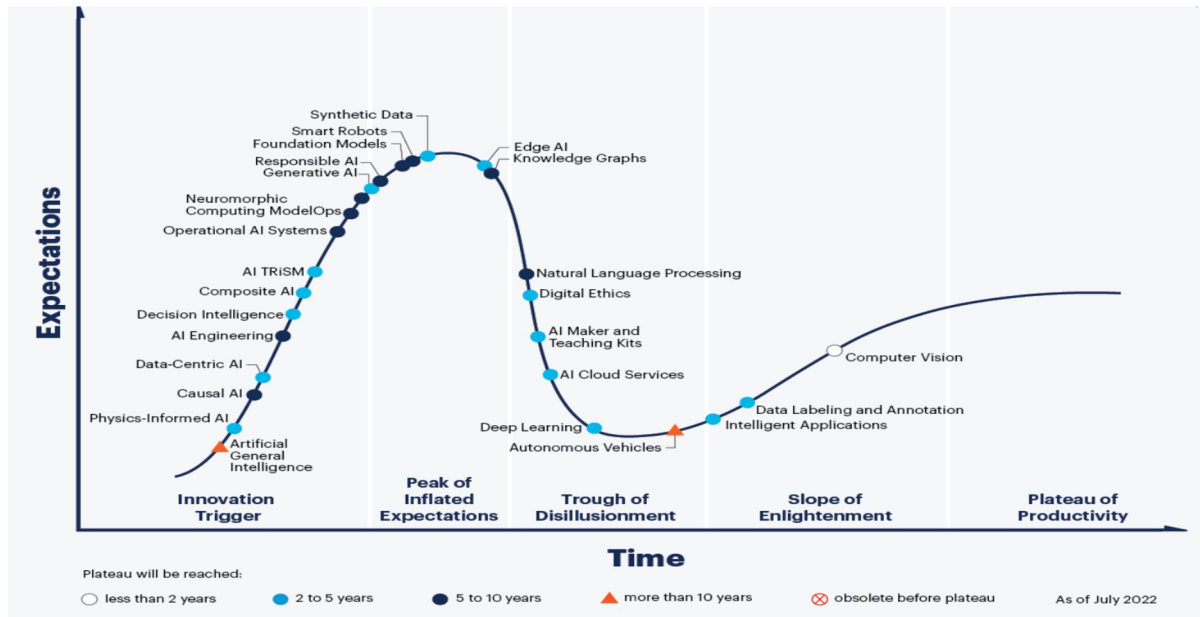
Gartner Hype Cycle

Blockchain

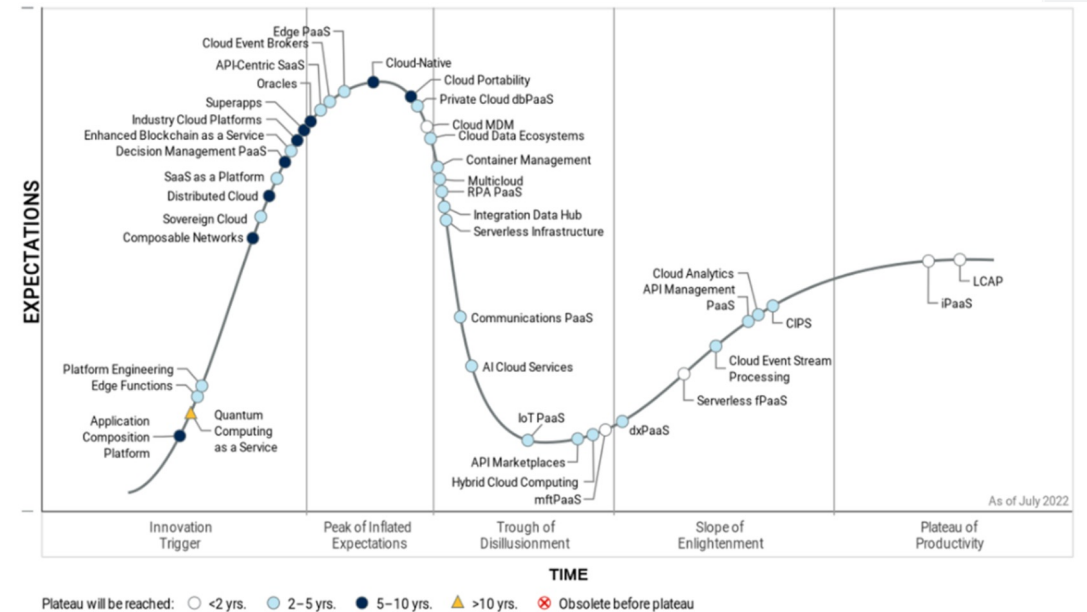


Gartner Hype Cycle

AI Technology



Cloud-based platform



Scalability of SaffronTrace

The solution can be easily scaled up using existing blockchain technology infrastructure and cloud computing services

The distributed nature of the blockchain network allows for seamless scaling while maintaining the integrity and security of the data

As the demand for the solution grows, additional servers and locations across the world may be required to maintain and improve the system's performance

With the integration of AI and machine learning algorithms, the solution can continuously improve and become more efficient in tracking saffron from farm to market



Cost/Revenue Analysis

Development costs: Assumed a team of 10-15 people could work for about 12-19 months to develop the technology, including testing, bug fixing, and integration considering the complexity as medium

Subscription fees: Assumed that we would have 50 users in the first year

Transaction fees: We assumed an average of 100,000 transactions in the first year and a fee of \$0.10 per transaction

Advertising fees: We assumed that we would have 10 advertisers paying \$10,000 per year for advertising space



Cost/Revenue Analysis

Category	Amount	Explanation
Development costs	\$500,000	Cost of developing the blockchain network, software, and other expenses
Operational costs	\$200,000	Costs associated with running the business, such as salaries and rent
Maintenance costs	\$50,000	Cost of maintaining and updating the software and hardware
Total costs	\$750,000	Sum of the development, operational, and maintenance costs
Subscription fees	\$250,000	Revenue from charging saffron industry players a subscription fee
Transaction fees	\$10,000	Revenue from charging a transaction fee for every recorded transaction
Advertising fees	\$100,000	Revenue from charging for advertising space on the platform
Total revenue	\$360,000	Sum of subscription, transaction, and advertising fees



Financing SaffronTrace

Angel investors

- Support innovative and socially responsible ventures, so saffron trace's use of blockchain technology to improve supply chain transparency and sustainability could be appealing to them

Bank loans

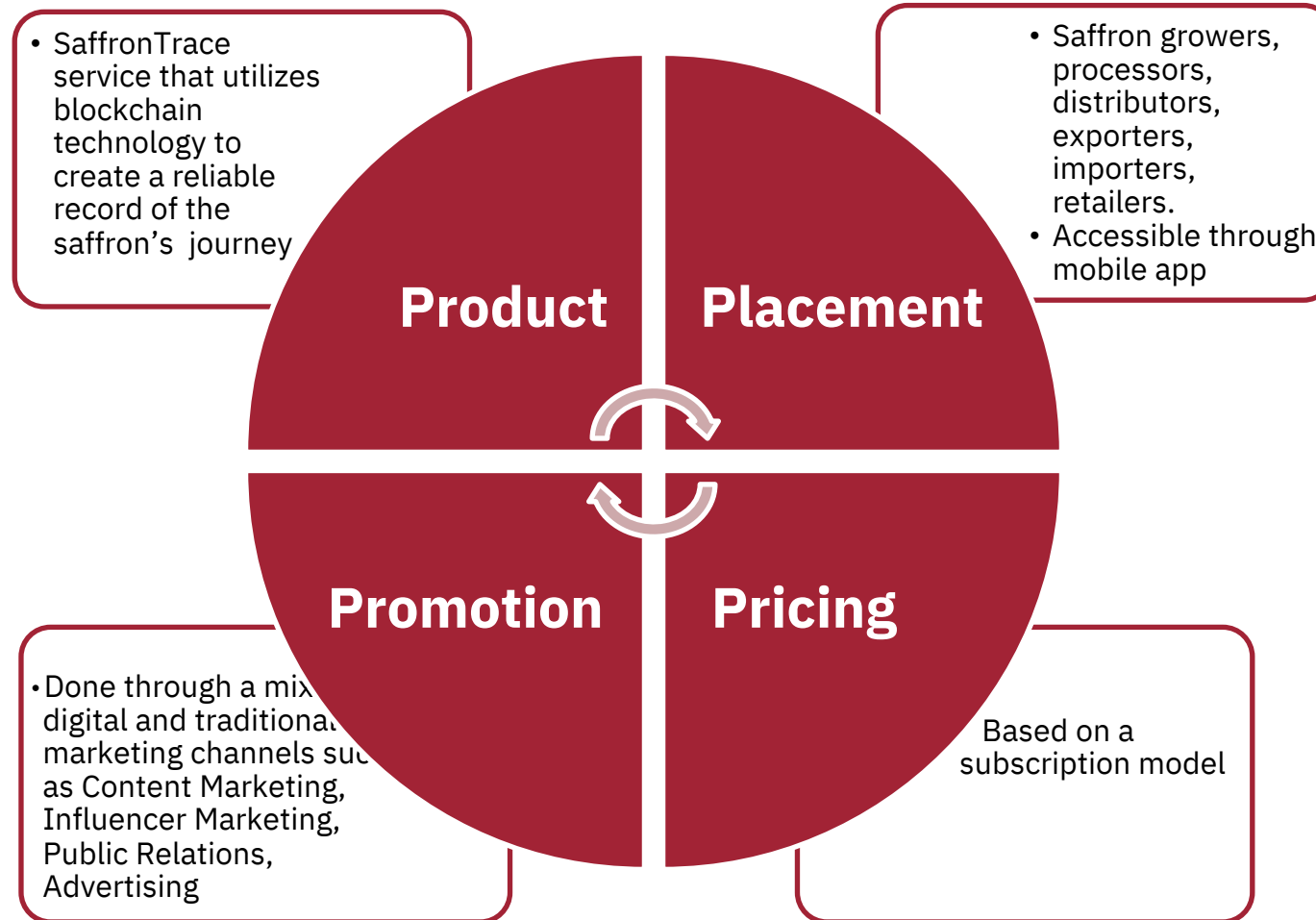
- Bank loan can be applied for financing SaffronTrace.
- Collateral or a strong credit history required

Grants

- Grant proposal can be developed to get funds
- Technology innovation, sustainability, and supply chain transparency could align with the goals of saffron trace



Marketing- 4 P's



Success Metrics

Company Perspective

Decrease in the number of **fraudulent** packages in the supply chain

The **efficiency** of the supply chain process can be measured by the time and cost savings achieved through the use of real-time updates.

The **accuracy** of the data collected can be measured by comparing the data collected from the microchip to physical inspections of the saffron products.



Success Metrics

Company Perspective

The success of a blockchain solution can be measured by the level of **transparency** it offers. This can be assessed by examining the level of information available to all participants, the ease of access to this information, and the ability to track the saffron from its origin to its final destination

Transaction throughput refers to the number of transactions that can be processed by the blockchain network per second. A high transaction throughput is important for a system like Saffron tracing as it involves multiple parties making transactions in real-time.



Success Metrics

Investor Perspective

The level of **adoption** of the blockchain solution can be measured by the number of saffron supply chain participants using the technology.

The **return on investment** (ROI) of the blockchain solution can be measured by comparing the cost savings achieved to the investment made in implementing the technology



Success Metrics

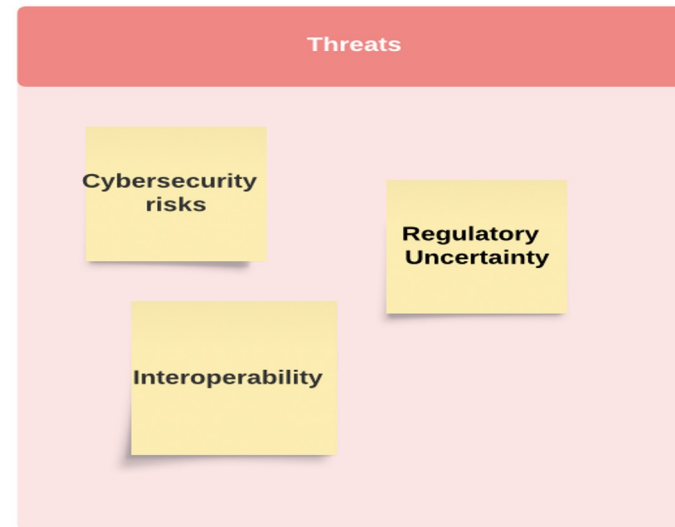
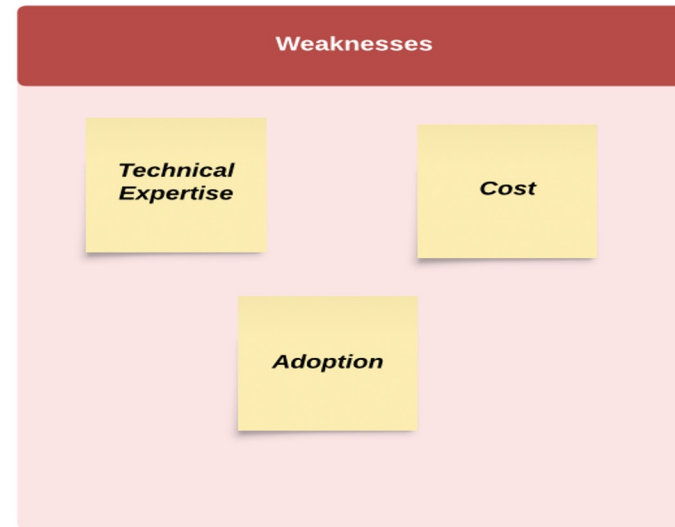
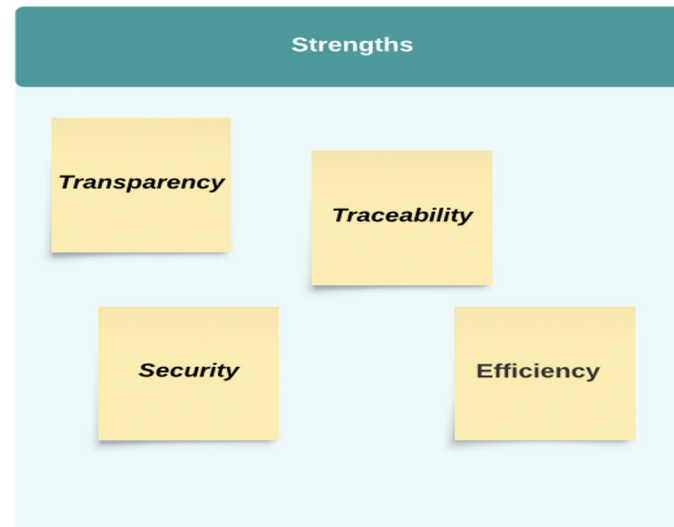
Customer Perspective

Traceability: The ability to trace the saffron from its origin to its final destination can be measured by the level of detail provided in the blockchain network.

The **quality** of the saffron products can be measured by examining the data collected from the microchip and comparing it to industry standards.



SWOT Analysis



SWOT Analysis

STRENGTHS

Transparency: Blockchain technology provides a transparent and immutable ledger of transactions that can be accessed by all stakeholders.

Traceability: Blockchain technology can enable the tracking of saffron products from their origin to their final destination, providing a high level of traceability and accountability.

Security: The tamper-proof nature of blockchain technology can improve security by protecting against fraud, counterfeiting, and other malicious activities.

Efficiency: Real-time updates of data collected from the microchips embedded in the saffron packages can lead to increased efficiency and cost savings in the supply chain



SWOT Analysis

WEAKNESS

Technical Expertise: Implementing and managing blockchain technology requires technical expertise that may not be readily available to all stakeholders.

Cost: Implementing and maintaining a blockchain solution can be expensive, especially for small and medium-sized businesses.

Adoption: The success of a blockchain solution for saffron tracing depends on the willingness of saffron supply chain participants to adopt the technology, which may be challenging if stakeholders are not fully informed about the benefits.



SWOT Analysis

OPPORTUNITIES

Competitive Advantage: Adopting blockchain technology for saffron tracing can provide a competitive advantage by improving supply chain efficiency, transparency, and security.

Improved Stakeholder Trust: By providing greater transparency and accountability in the saffron supply chain, stakeholders may be more likely to trust the quality and authenticity of the saffron products.

New Business Models: Blockchain technology can enable new business models and revenue streams, such as the creation of saffron tracking platforms that can be monetized.

SWOT Analysis

THREATS

Regulatory Uncertainty: The regulatory environment surrounding blockchain technology is still evolving, which can create uncertainty and risk for businesses adopting the technology.

Cybersecurity Risks: Blockchain technology is not immune to cybersecurity risks, such as hacking or theft of private keys, which can compromise the security of the supply chain.

Interoperability: Blockchain solutions may not be interoperable with other systems or platforms, which can create challenges for stakeholders who need to integrate with other supply chain systems or data sources.



STAKEHOLDER ANALYSIS

Saffron growers and suppliers: These stakeholders are responsible for the production and supply of saffron products. They would benefit from blockchain implementation by having increased transparency and traceability in the supply chain, which can help build trust and increase the value of their products.

Distributors and retailers: These stakeholders are responsible for distributing and selling saffron products. They would benefit from blockchain implementation by having access to real-time data on the location and quality of saffron products, which can improve supply chain efficiency and reduce costs.

Customers: These stakeholders are the end-users of saffron products. They would benefit from blockchain implementation by having greater transparency and traceability of the saffron products they purchase, which can help ensure quality and authenticity.

Government regulators: These stakeholders are responsible for overseeing the saffron industry and ensuring compliance with regulations. They would benefit from blockchain implementation by having a more transparent and traceable supply chain, which can help improve regulatory oversight and reduce the risk of fraud and counterfeiting.



STAKEHOLDER ANALYSIS

Investors and shareholders: These stakeholders are interested in the financial performance of the companies involved in the saffron supply chain. They would benefit from blockchain implementation by having access to real-time data on supply chain efficiency and cost savings, which can help inform investment decisions.

Industry associations and standards organizations: These stakeholders are responsible for setting industry standards and promoting best practices in the saffron industry. They would benefit from blockchain implementation by having a more transparent and traceable supply chain, which can help ensure compliance with industry standards and promote trust in the saffron supply chain.

Technology providers: These stakeholders are responsible for developing and providing blockchain technology solutions. They would benefit from blockchain implementation by having an opportunity to provide services and solutions to the saffron industry, which can create new revenue streams and increase market share.





Thank You