

# TEAM HOTPOT

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# CHOSEN DOMAIN

- Food Supply Chain
  - Specializing in Raw Beef

# EXISTING BEEF SUPPLY CHAIN BLOCKCHAIN SOLUTIONS



## ❑ Beefledger:

- ❑ Asset Tracker
- ❑ Transactions

## ❑ Our solution:

- ❑ Asset Tracker
- ❑ Transactions
- ❑ Certification
- ❑ Data Analysis
  - ▶ Smart Order
  - ▶ Feedback

# SUITABILITY FOR BLOCKCHAIN

**Transparency** - It is difficult for consumers to verify authenticity of food products, transparency of a product's supply chain can be improved using blockchain.

**Efficiency** - Blockchain can better connect different participants together, accelerate the exchange of information between participants and avoid like food waste or inventory shortage in production links, thus improving the production efficiency of the supply chain.

**Integrity** - Blockchain can provide high levels of data integrity, which can prevent food fraud, such as counterfeit beef.

# FUNCTIONAL & NON-FUNCTIONAL REQUIREMENTS

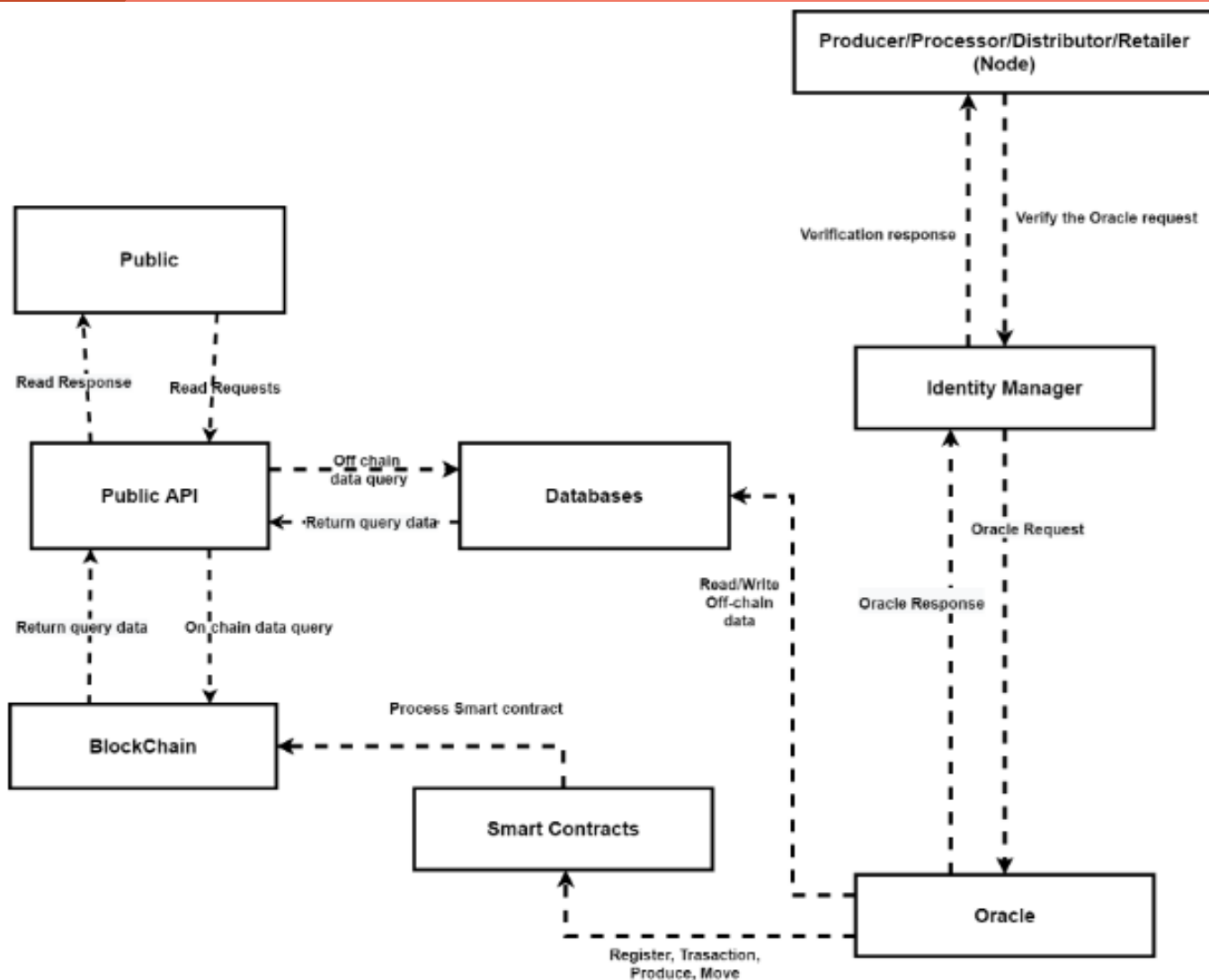
## **Functional requirements:**

- Supply chain information regarding beef product can be queried by the public.
- Anyone can view the entire supply chain, such that beef products can be tracked at every step from farmers to consumer.
- All participants can verify the certifications of involving parties in the supply chain.
- Only permitted users can write into the system.
- All submissions must be reviewed by smart contracts.
- The system should be able to keep tracking of the inventory of beef processors.
- Accepted orders in the upstream production chain can be automatically converted into downstream supplier order requests.
- The system should be able to react to events such as damaged or contamination and be able to track and identify affected parties.
- All node data needs to be consistent.

## **Non-functional requirements:**

- Scalability
  - Integrity
  - Availability
  - Accessibility
- 

# ARCHITECTURE DESIGN 1



## On-chain Components:

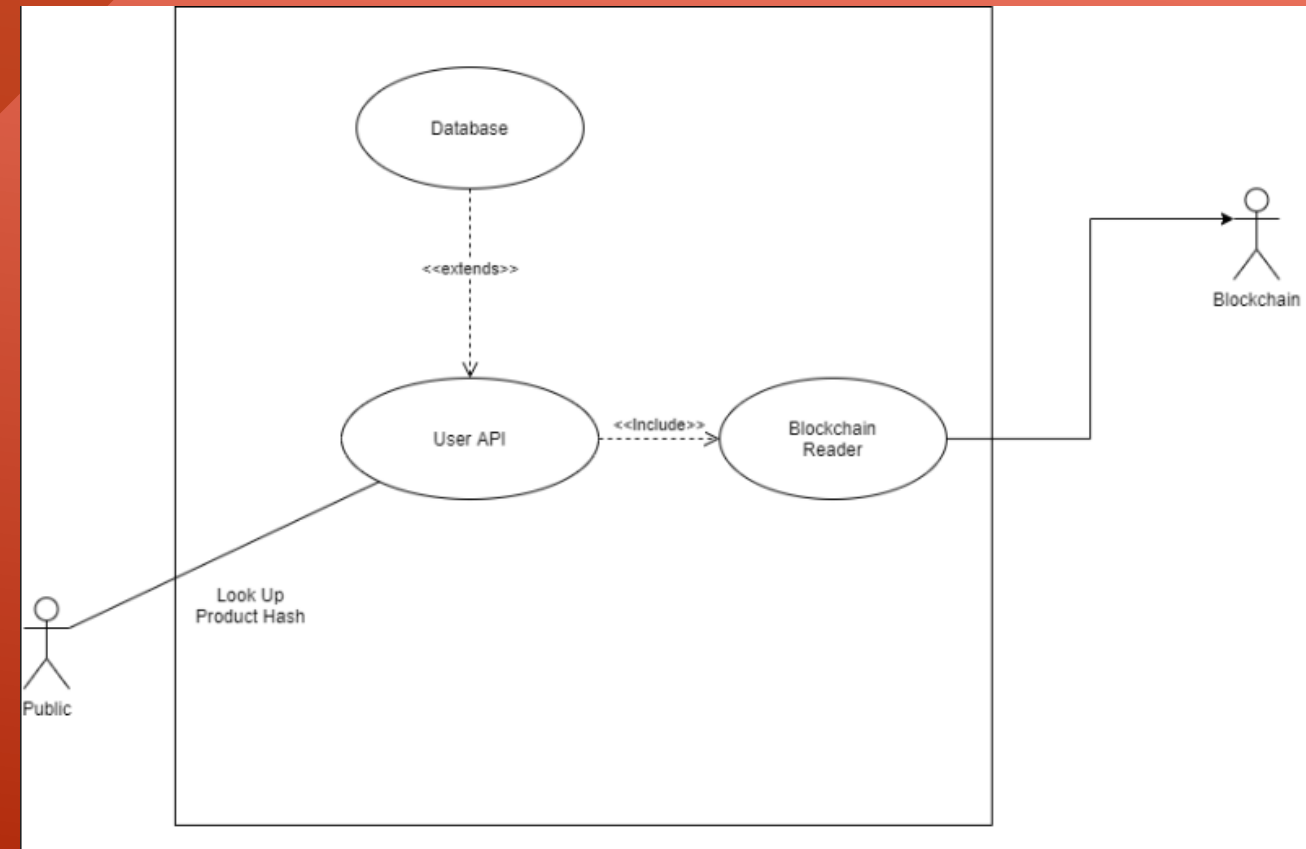
- Transport logs
- Item quantity
- Hash of the off-chain data

## Off-chain Components:

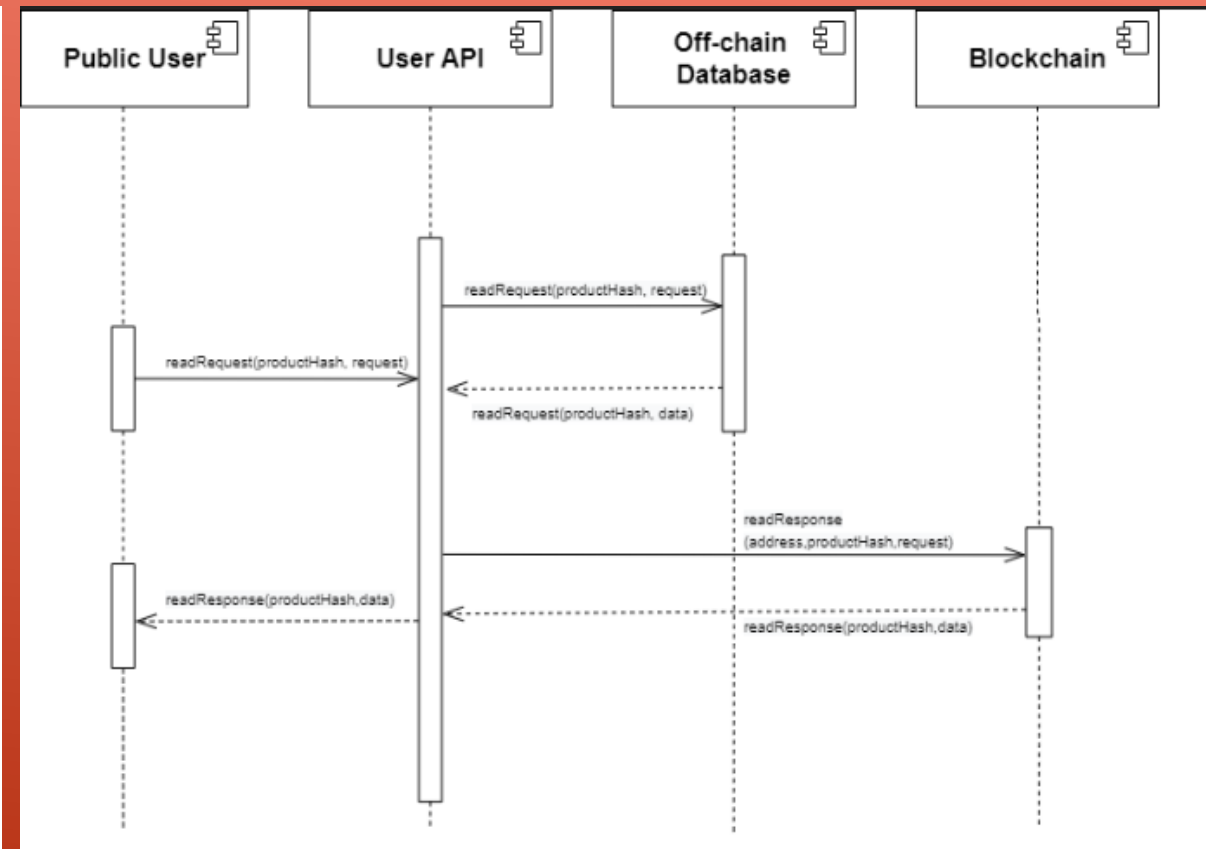
- Detailed information e.g. Expiry date, price, meat quality, organic

# VIEWPOINT/USE-CASE DIAGRAM 1

## SCENARIO1: PUBLIC USER READING DATA



Use case diagram

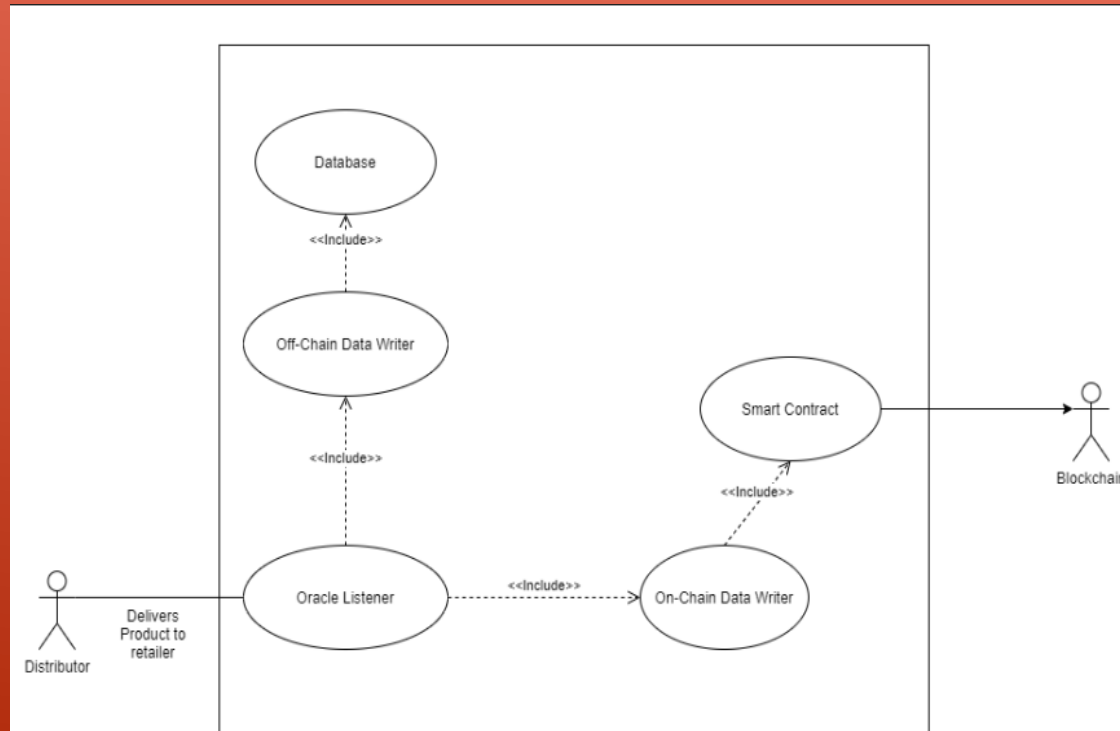


Sequence diagram

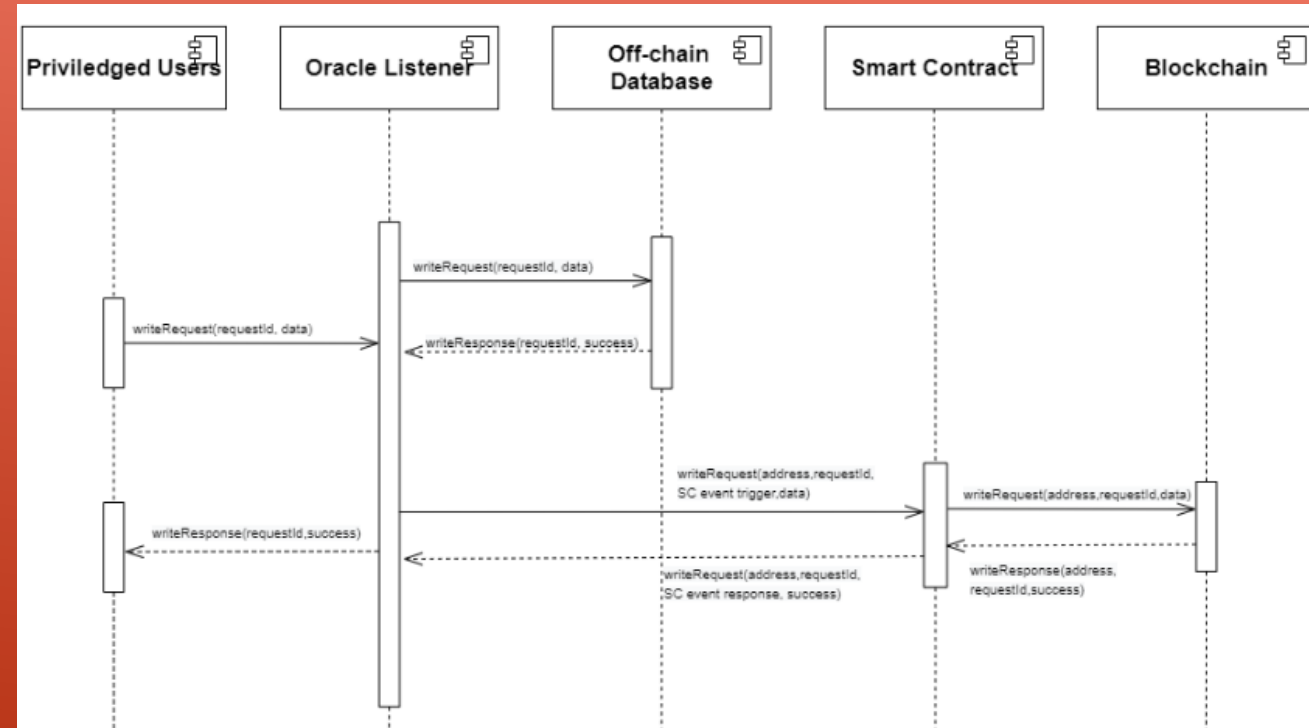
# VIEWPOINT/USE-CASE DIAGRAM 2

SCENARIO2:

NODE USER WRITES DATA INTO BLOCKCHAIN OR OFF-CHAIN DATABASE



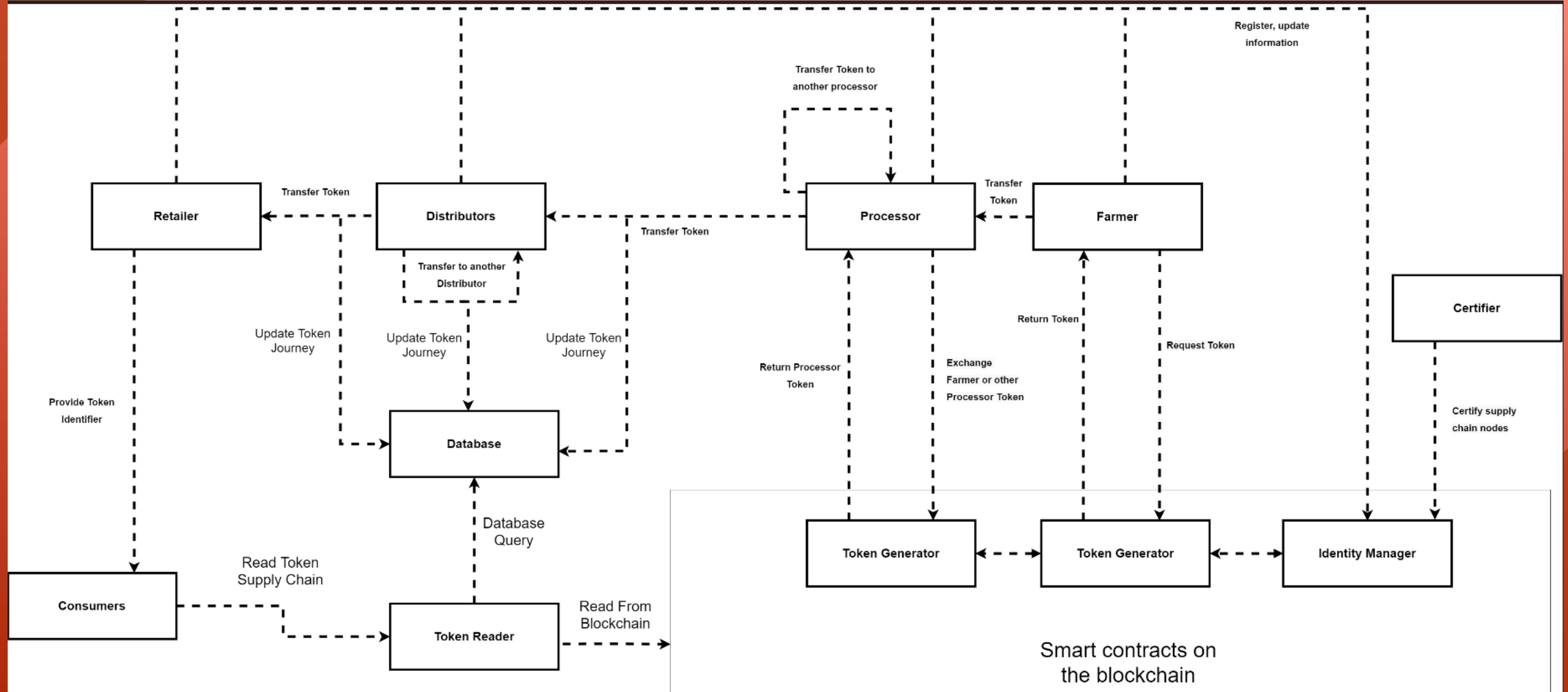
Use case diagram



Sequence diagram



# ARCHITECTURE DESIGN 2



# COMPARISON BETWEEN ARCHITECTURES

- Scalability – Both designs are scalable, able to handle concurrent transactions.
- Integrity – Both Designs have integrity through the immutability of data on the blockchain, a hash of the off-chain data is placed onto the blockchain to provide integrity for off-chain information.
- Availability - Both designs contain a mixture of on chain and off-chain data, Design 2 has more on-chain data, making it slightly higher availability
- Accessibility – Both Designs have equal Accessibility. Both require supply chain participants to have a blockchain address, both designs do not require consumers to have blockchain addresses.
- Cost – Design 1 writes less data into the blockchain compared to Design 2, Design 1 has slightly lower cost.

# PROPOSED DEVELOPMENT PLAN

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Complete the basic design	Week4	90%	2021/6/21
Platform selection and infrastructure deployment	Week5	25%	2021/6/28
Completed the deployment of on-chain functionality	Week6	0%	2021/7/5
Completed off-chain function deployment	Week7	0%	2021/7/12
Debug and Testing	Week8	0%	2021/7/26
Demo and Persentation	Week9	0%	TBD

► Q&A

THANK YOU