- **PROJECT THEME:**
  "SAFETURE"-Translucent & Trackable Smart Container and safe Transportation.

- **TEAM MEMBERS:**
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- **ABSTRACT:**

  Amalgamation of Blockchain and IOT is the emerging technology in today's world. Procurement happens in each and every aspect of an organization from business to IT needs and everything needed in corporation is tied to the supplier and there will be a long list of suppliers in no time.

  This project focuses on safety, security and opacity of pharmaceuticals supply with the help of **Blockchain** and **IOT**(Internet Of Things) by using **Cloud** as a platform for easy storage,retrieval and analysis of data received from the sensors. In prolongation with this idea,our application also emphasizes on Accident Detection of the vehicle carrying the goods and also alert the supplier regarding the mishap as well as send notification to the nearby hospitals ,and additionally would let the manufacturer and hospitals know about the current location where the catastrophe has occurred so that they could take appropriate action.

- **PROJECT DESCRIPTION:**
      "SAFETURE" will be a pioneer in developing an automated system that keeps the track of various products and articles present in the container (vehicle to carry the products) with a **standard communication system** and also make the journey of the container sophisticated by detecting accident.
      Once the container departs from manufacturer's location it stops periodically from one warehouse to another.In case of **pharmaceuticals supply chain logistics**, the

medications need to stay within certain temperature range. Our application would **monitor**,**verify** and **steward** medications from source to destination by collecting and analyzing the data read from sensors.

Major Functionalities :

The three main modules of our system are :

- **Blockchain in Chain Logistics :**
  Keeping blockchain as the heart of our application,we can achieve,
  1. **Traceability** : By **keeping track** of all the processes and checkpoints which would help the manufacturer or shipper to identify the trouble spots and Take remedies to automatically ON/OFF the air conditioner based on fluctuations of temperature around the threshold value which would be collected with the help of DHT11 sensor situated inside the container.
  2. **Transparency :** By **reducing fraud** for pharmaceuticals where blockchain's immutability provides basis for traceability of drugs from manufacturer to consumer,identifying where the Supply chain breaks down.

  In addition to cutting losses,there is potential to improve consumer safety and prevent some of the estimated **1 million deaths annually** from counterfeit medicines.
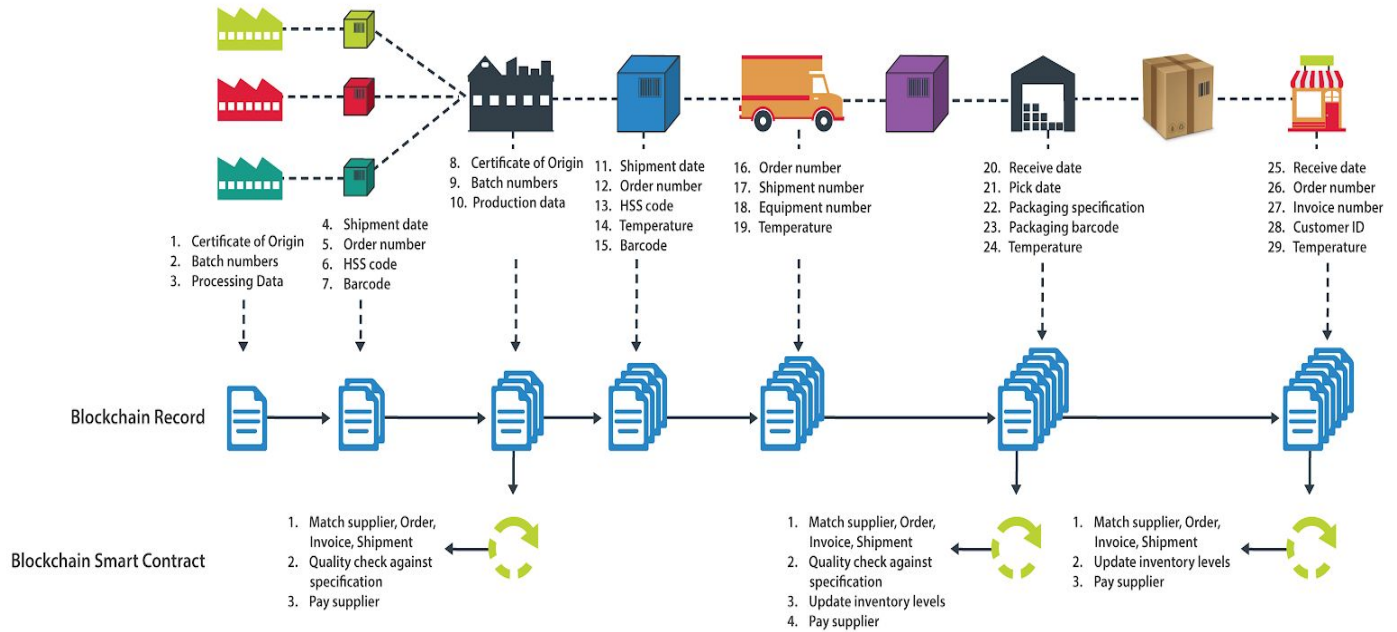
- **Accident Detection :**
  Continuing with above idea,the proposed system would also encapsulate **Smart accident detection** for container. This can be done with the help of window glass vibration sensor,break sensor etc.In case of accident,system will notify nearby hospitals to save life of driver.Also alert the drug manufacturer about the accident in order to take immediate actions.

- **MAJOR FUNCTIONALITIES:**
  - Efficient transportation of pharmaceuticals from manufacturer to market.
  - In between the path,if any defect found by sensors,the product is not send further and manufacturer is notified about that damage.
  - Detect and notify the nearby hospitals and manufacturers about accident of container.

- **OVERALL STRUCTURE:**

Blockchain supply chain diagram
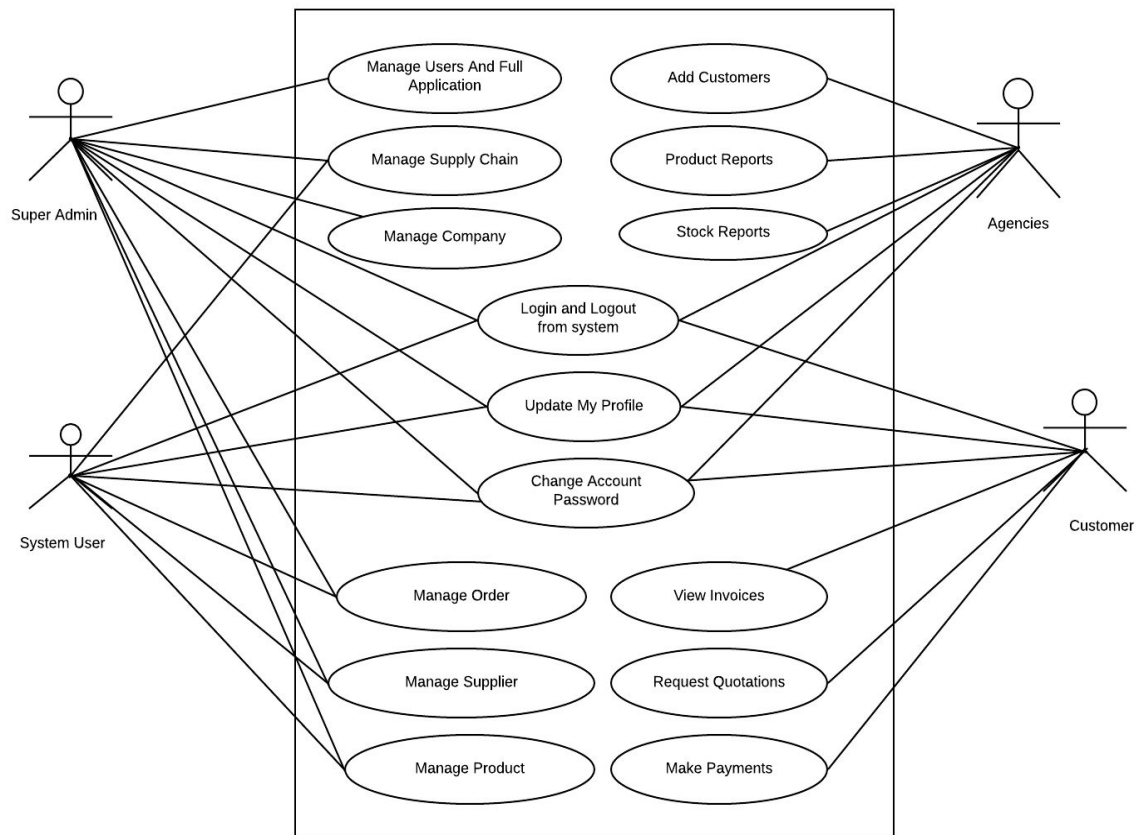
1. Certificate of Origin
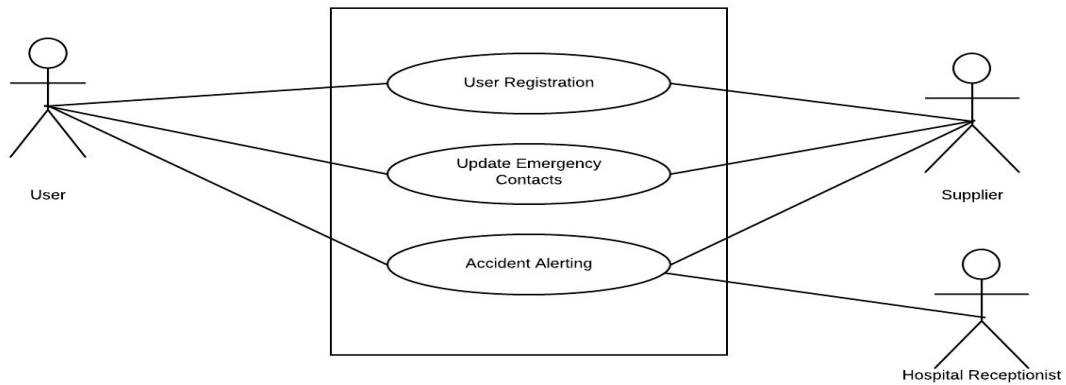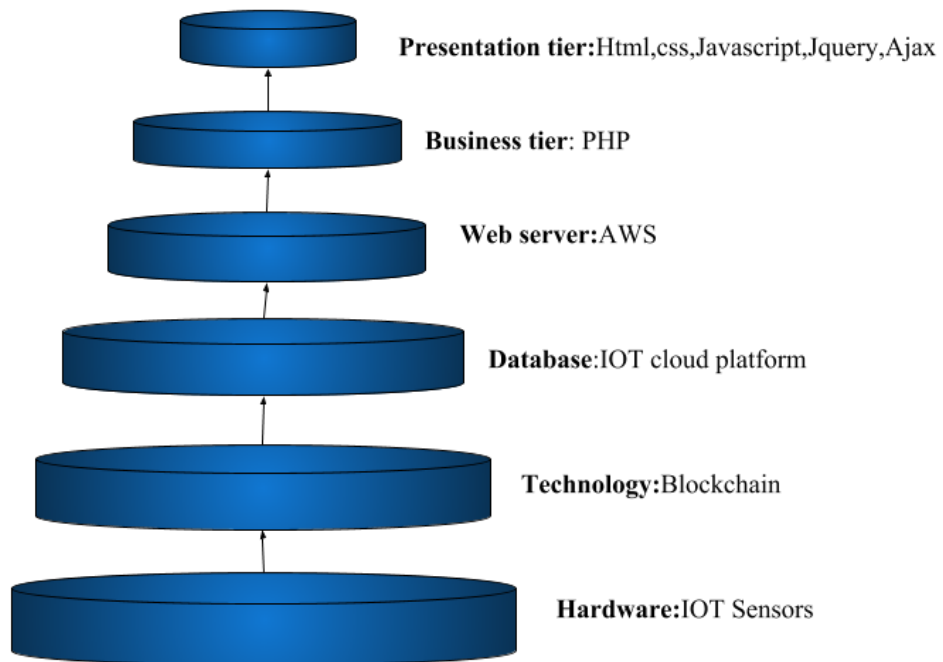2. Batch numbers
3. Processing Data

4. Shipment date
5. Order number
6. HSS code
7. Barcode

8. Certificate of Origin
9. Batch numbers
10. Production data

11. Shipment date
12. Order number
13. HSS code
14. Temperature
15. Barcode

16. Order number
17. Shipment number
18. Equipment number
19. Temperature

20. Receive date
21. Pick date
22. Packaging specification
23. Packaging barcode
24. Temperature

25. Receive date
26. Order number
27. Invoice number
28. Customer ID
29. Temperature

Blockchain Record

Blockchain Smart Contract

1. Match supplier, Order, Invoice, Shipment
2. Quality check against specification
3. Pay supplier

1. Match supplier, Order, Invoice, Shipment
2. Quality check against specification
3. Update inventory levels
4. Pay supplier

1. Match supplier, Order, Invoice, Shipment
2. Update inventory levels
3. Pay supplier

● **USE CASE DIAGRAM:**

Use case diagram with actors: Super Admin, System User, Agencies, Customer. Use cases: Manage Users And Full Application, Add Customers, Manage Supply Chain, Product Reports, Manage Company, Stock Reports, Login and Logout from system, Update My Profile, Change Account Password, Manage Order, View Invoices, Manage Supplier, Request Quotations, Manage Product, Make Payments.

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Fig 1: Supply Chain Management

Fig 2:Smart Accident Detection

- **TECHNOLOGY STACK:**

Presentation tier: Html,css,Javascript,Jquery,Ajax

Business tier: PHP

Web server:AWS

Database:IOT cloud platform

Technology: Blockchain

Hardware:IOT Sensors

SNAPSHOTS:

1.

2.

3.

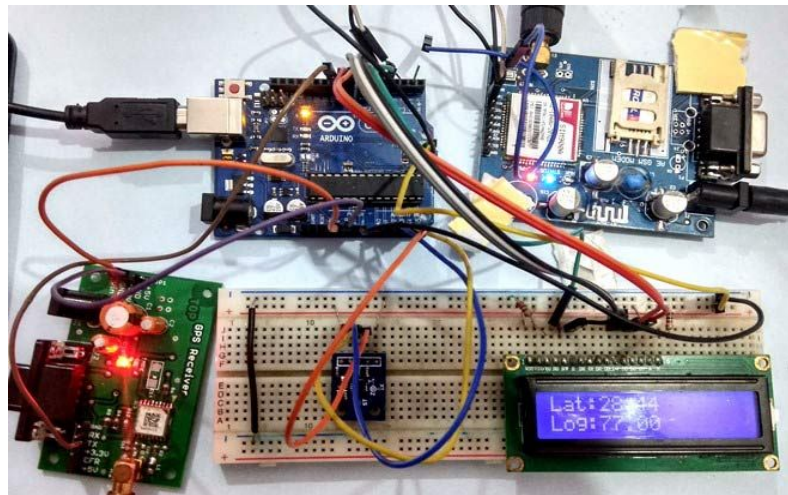4.

5.

6.

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8.

Fig. Flow of supply chain

Fig. Accident accident detection hardware setup