



School: Campus:
Academic Year: Subject Name: Subject Code:
Semester: Program: Branch: Specialization:
Date:

Applied and Action Learning

(Learning by Doing and Discovery)

Name of the Experiment : Blockchain in Supply Chains – Use Case Analysis

* Coding Phase: Pseudo Code / Flow Chart / Algorithm

Introduction:

- **Participant Initialization:**
Identify all key stakeholders in the supply chain — **Manufacturer, Supplier, Transporter, Distributor, Retailer, and Customer.**
- **Product Registration:**
Each product is assigned a **unique digital token or ID** on the blockchain (e.g., *Product ID #A123* created by the manufacturer).
- **Transaction Recording:**
Every stage of the product's journey — from **manufacturing and packaging to shipping, delivery, and sale** — is recorded as a **new block** on the blockchain.
Each block includes:
 - Product ID
 - Sender and Receiver details
 - Timestamp
 - Transaction information
 - Digital signature for authenticity
- **Verification and Validation:**
All transactions are **verified by network nodes** before being added to the blockchain, ensuring **data accuracy and authenticity.**
- **Linking and Hashing:**
Each block is **cryptographically linked** to the previous one using a **secure hash**, creating a **tamper-proof and immutable record.**
- **Consensus Mechanism:**
The network employs a **consensus protocol** (e.g., Proof of Stake or Proof of Authority) to validate data, ensuring **consistency and trust** across all nodes.
- **Traceability and Tracking:**
Stakeholders can **trace the entire product lifecycle**, from raw material sourcing to final customer delivery.
- **Audit and Transparency:**
The **immutable ledger** provides complete **auditability and transparency**, serving as reliable proof for **regulators, businesses, and consumers.**

* Softwares used

1. Chrome Web Browser
2. Blockchain Supply-chain

<https://www.antiersolutions.com/blogs/top-5-real-life-blockchain-use-cases-in-supply-chain-in-2023/>

* Implementation Phase: Final Output (no error)

Over a century ago, supply chains were simple and local, but globalization has made them complex. Today, businesses are embracing **Blockchain technology** to **digitize, secure, and streamline** their supply chains against modern disruptions.

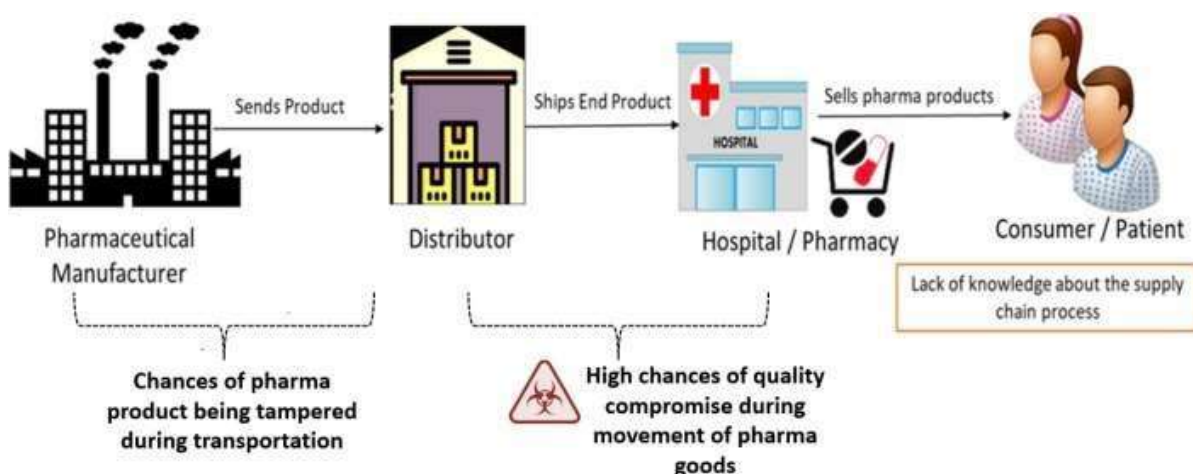
Transportation and Logistics Supply Chain



Food Supply Chain



Pharmaceutical Supply chain



- **Adoption Strategies:**
Promote blockchain integration through **pilot projects, phased rollouts**, and focus on **high-value, high-risk industries** to achieve faster ROI and stakeholder confidence.
- **Technical Scalability Solutions:**
Enhance performance and efficiency by implementing **Layer 2 blockchain protocols, sharding techniques**, and **hybrid architectures** that balance scalability with security.
- **Regulatory Compliance and Governance:**
Reduce regulatory risks by **partnering with compliance specialists, proactively engaging with regulators**, and staying aligned with evolving legal frameworks.
- **System Flexibility and Adaptability:**
Develop **future-ready, modular systems** capable of adapting to **changing operational, legal, and technological environments** in the global supply chain landscape.

* Observations

1. Successful blockchain implementation requires **strategic adoption and stakeholder readiness**.
2. **Scalability and regulatory clarity** remain key hurdles for large-scale deployment.
3. Building **flexible and adaptive systems** ensures long-term sustainability and compliance.

ASSESSMENT

Rubrics	Full Mark	Marks Obtained	Remarks
Concept	10		
Planning and Execution/ Practical Simulation/ Programming	10		
Result and Interpretation	10		
Record of Applied and Action Learning	10		
Viva	10		
Total	50		

Signature of the Student:

Name :

Regn. No. :

Signature of the Faculty:

Page No.....

* As applicable according to the experiment.
Two sheets per experiment (10-20) to be used.