



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.

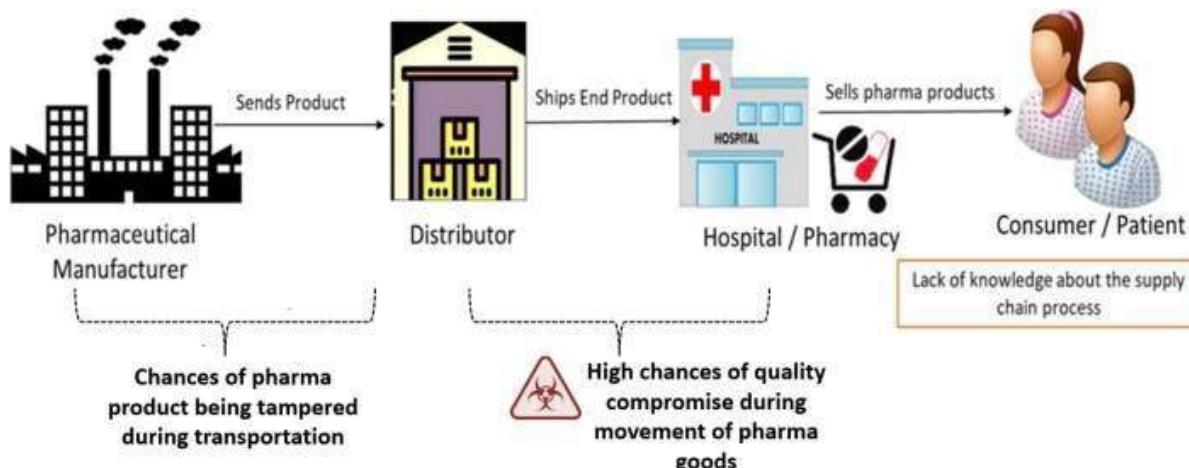
Transportation and Logistics Supply Chain



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 :

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Signature of the Faculty: