



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**

- **Initialization of Participants:**

Identify all parties involved — Manufacturer, Supplier, Transporter, Distributor, Retailer, and Customer.

- **Product Registration:**

Each product is assigned a **unique digital ID** or token on the blockchain.

(e.g., Product ID #A123 is created by the manufacturer.)

- **Recording Transactions:**

Each stage of product movement (manufacturing, packaging, shipping, delivery, sale) is recorded as a new **block** on the blockchain.

Each block contains:

- Product ID
- Sender & Receiver information
- Timestamp
- Transaction details
- Digital signature for authenticity

- **Verification and Validation:**

Every transaction is verified by participating nodes before being added to the chain — ensuring no false data is recorded.

- **Linking and Hashing:**

Each block is linked to the previous block using a **cryptographic hash**, maintaining a secure and tamper-proof record.

- **Consensus Mechanism:**

The network uses a **consensus protocol** (such as Proof of Stake or Proof of Authority) to validate entries, ensuring data consistency across all nodes.

- **Traceability and Tracking:**

All stakeholders can trace the **complete history of the product** — from raw material origin to the final sale.

- **Audit and Transparency:**

The immutable ledger serves as proof of authenticity for regulators, businesses, and customers.

Software used:

1. VS Code.
2. MS Word.
3. Brave for researching.

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

* Implementation Phase: Final Output (no error)

- The supply chain network is created, connecting all stakeholders such as the manufacturer, supplier, transporter, distributor, retailer, and customer.
- The manufacturer registers a new product on the blockchain by creating its **unique digital record** with all essential details (product ID, date, batch number, and origin).
- As the product moves through the supply chain, each stage (manufacturing, packaging, shipment, delivery, and sale) is recorded as a **new block** on the blockchain.
- Every transaction is **validated by the network participants**, ensuring data accuracy and preventing unauthorized changes.
- Each verified transaction is **linked to the previous block** using a **cryptographic hash**, maintaining data integrity and forming an unbreakable chain.
- The blockchain ledger is **automatically updated across all nodes**, ensuring that every participant has access to the latest and most accurate data.
- The system provides **real-time tracking** of the product's status and location throughout the supply chain.
- The final blockchain ledger displays a **complete and transparent history** of the product from its origin to its final delivery to the customer.
- The output demonstrates **secure, tamper-proof, and trust-based record-keeping**, eliminating fraud, improving accountability, and enhancing supply chain visibility.

* Observations:

- Each transaction is recorded permanently — ensuring data integrity.
- Blockchain creates transparency among all parties, reducing disputes.
- Counterfeit detection becomes easier since each product has a unique digital record.
- Smart contracts automate payment and delivery confirmations.
- Real-time tracking helps identify bottlenecks and delays.
- Improves trust between suppliers and customers by providing verifiable proof of product origin.

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:

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