



## P P SAVANI UNIVERSITY

**Assignment No. - 1  
ON  
BLOCKCHAIN TECHNOLOGY(SSCS3021)**

**TITLE: INDUSTRIAL IMPACT AND ANALYSIS OF BLOCKCHAIN  
TECHNOLOGY**

**BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY (BSC-IT)**

**SUBMITTED TO:**

**Name: KAUSHAL SINGH(KSV)**

**Designation: ASSISTANT PROFESSOR**

**P P Savani University**

**Max. Marks: 50**

**Marks Obtained:**

**Faculty Signature: \_\_\_\_\_**

**SUBMITTED BY:**

**Name: RAJ MO FAHIM ZAKIR**

**Enrollment: 23SS02IT161**

**BSCIT5B-Batch 2023-26**

**INSTITUTE OF COMPUTER SCIENCE AND APPLICATIONS  
P P SAVANI UNIVERSITY  
MANGROL, SURAT- 394125 (GUJARAT)**



**Student Name: RAJ MO FAHIM ZAKIR**  
**Enrolment Number: 23SS02IT161**  
**Subject Name: BLOCKCHAIN TECHNOLOGY**  
**Subject Code: SSCS3021**

## Practical-1

**Date:18/06/2025**

**Aim:** INDUSTRIAL IMPACT AND ANALYSIS OF BLOCKCHAIN TECHNOLOGY

### **Introduction to Blockchain**

#### **What is Blockchain?**

Blockchain is a decentralized, distributed digital ledger technology that records transactions across many computers in such a way that the registered transactions cannot be altered retroactively.

At its core, a blockchain is:

- A growing list of records called blocks
- Linked using cryptography
- Each block contains a cryptographic hash of the previous block
- A timestamp
- Transaction data

#### **Key Characteristics:**

**Decentralization:** No single entity controls the network

**Transparency:** All transactions are visible to all participants

**Immutability:** Once recorded, data cannot be altered

**Security:** Cryptographic techniques protect against fraud

**Consensus-based:** All participants agree on validity of transactions

#### **How Blockchain Works?**

1. A transaction is requested.
2. The transaction is broadcast to a P2P network.
3. Network nodes validate the transaction using known algorithms.
4. Once verified, the transaction is combined with others to create a new block.
5. The new block is added to the existing blockchain.
6. The transaction is complete.

### Task 1: Overview Table – 10 Blockchain Applications

Application	Industry	Launch Year	Blockchain Type	Technology Used	Key Benefits	Adoption Example
Bitcoin	Finance	2009	Public	Custom Protocol	Decentralized currency, anti-fraud	Global (P2P Users, Investors)
Ethereum	Finance/DApps	2015	Public	Ethereum Protocol	Smart contracts, DApps	MetaMask, Uniswap
IBM Food Trust	Supply Chain	2018	Private	Hyperledger Fabric	Traceability, food safety, transparency	Walmart, Nestlé
VeChain	Supply Chain	2015	Public	VeChainThor	Product verification, anti-counterfeit	BMW, LVMH
Chainlink	Finance/Smart Contracts	2017	Public	Ethereum	Decentralized oracles, real-world data access	Google Cloud, SWIFT
MedRec	Healthcare	2016	Private	Ethereum (Prototype)	Secure patient records, access control	MIT Research Hospitals
Ripple (XRP)	Finance	2012	Private	Ripple Protocol	Fast cross-border transactions, low fees	Santander, SBI
OriginTrail	Supply Chain	2018	Public	Ethereum + ODN	Verified data sharing, decentralized knowledge	U.S. FDA Pilot
Brave/BAT	Advertising	2017	Public	Ethereum	Privacy, ad revenue sharing	Brave Browser Users
Bloxberg	Academia/Research	2019	Public	Ethereum	Scientific data proof, timestamping	Max Planck Society

## **Task 2: Analyze Industrial Impact (3 Applications)**

### **Application 1: IBM Food Trust**

**Problem Addressed:** Traditional food supply chains lack transparency, leading to inefficiency and difficulty in tracing sources during food contamination outbreaks.

**Blockchain Solution:** IBM Food Trust provides a permissioned blockchain that allows stakeholders to record, verify, and track food products from farm to table.

**Benefits Gained:**

- Faster traceability (from 7 days to seconds)
- Improved consumer trust and safety
- Reduced waste due to accurate recalls

**Real-World Adopters:**

Walmart: Tracks leafy greens from suppliers

Nestlé & Carrefour: Track milk and infant formula in Europe

### **Application 2: VeChain**

**Problem Addressed:** High rates of counterfeiting and lack of authenticity in luxury goods, pharmaceuticals, and food products.

**Blockchain Solution:** VeChain provides a tamper-proof system using blockchain + IoT (NFC/RFID) to verify origin, transit, and authenticity.

**Benefits Gained:**

- Prevents counterfeit goods
- Builds brand trust
- Increases supply chain efficiency

**Real-World Adopters:**

LVMH: Luxury goods authentication

Walmart China: Tracks pork products supply

### **Application 3: Ripple (XRP)**

**Problem Addressed:** Traditional banking systems are slow and expensive for international money transfers.

**Blockchain Solution:** Ripple enables real-time gross settlement and low-fee currency exchange using the XRP token.

**Benefits Gained:**

- Transactions in 3–5 seconds
- Up to 60% cost reduction
- Global liquidity without pre-funded accounts

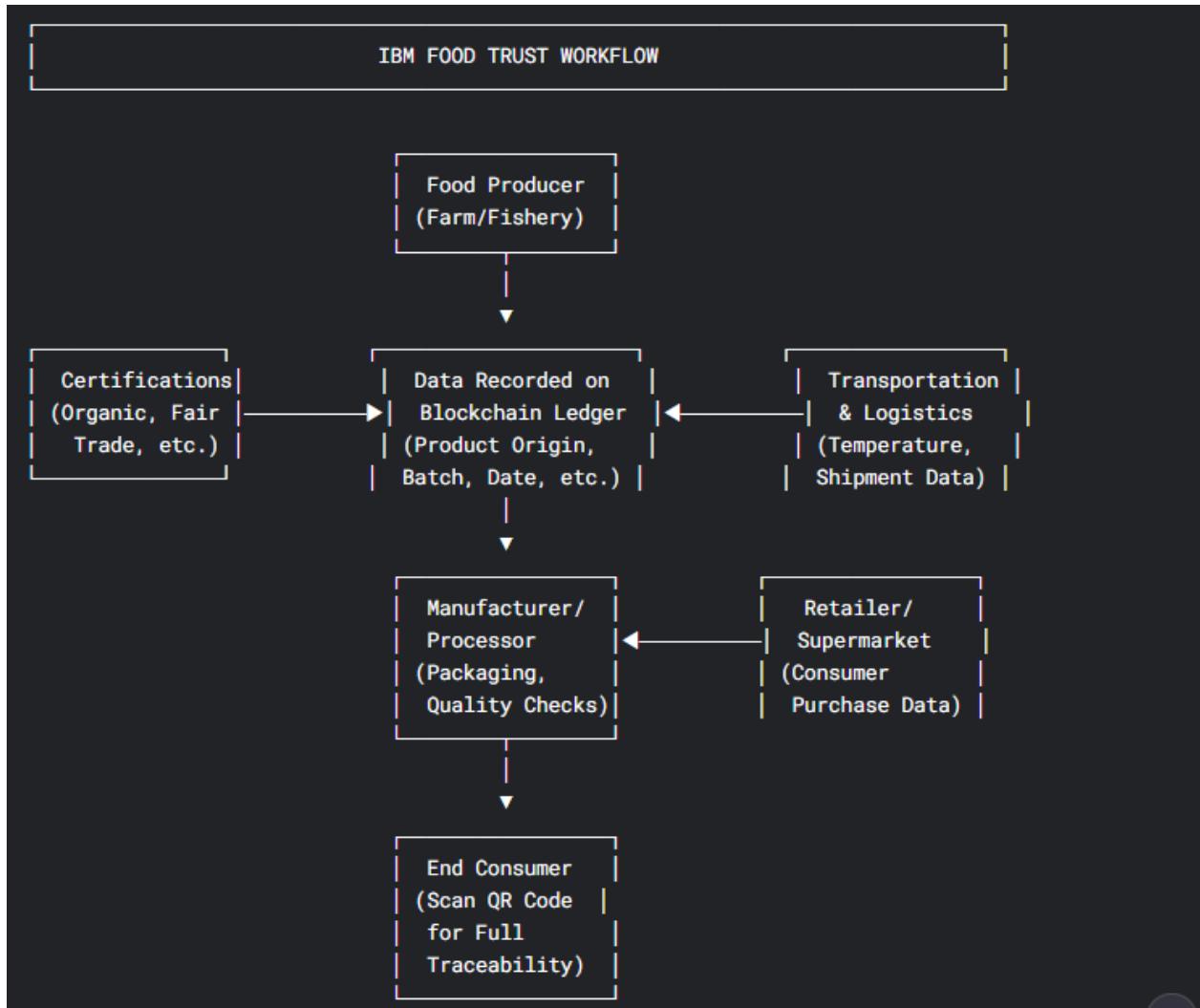
**Real-World Adopters:**

Santander Bank, SBI Holdings, PNC Bank

### Task 3: Visual Presentation

#### Comparative Table

Application	Industry	Blockchain Type	Key Benefits	Notable Adopter
Bitcoin	Finance	Public	Decentralized money	Individuals worldwide
Ethereum	DApps/Finance	Public	Smart contracts, DApps	Uniswap, MetaMask
IBM Food Trust	Supply Chain	Private	Food traceability	Walmart, Nestlé
VeChain	Supply Chain	Public	Anti-counterfeit, logistics tracking	BMW, LVMH
Chainlink	Finance	Public	Decentralized oracle services	SWIFT, Google
MedRec	Healthcare	Private	Secure patient data management	MIT Hospitals
Ripple	Finance	Private	Instant cross-border transfers	Santander, SBI
OriginTrail	Supply Chain	Public	Data integrity, decentralization	U.S. FDA Pilot
Brave/BAT	Advertising	Public	Ad revenue for users, privacy	Brave Browser
Bloxburg	Academia	Public	Research timestamping, transparency	Max Planck Society



### Key Steps:

- 1. Data Capture:** Each participant (farmer, transporter, processor, retailer) records product details on the blockchain.
- 2. Immutable Record:** Data (origin, processing, certifications, shipping conditions) is stored securely and cannot be altered.
- 3. Real-Time Tracking:** All stakeholders access a single source of truth for the product's journey.
- 4. Consumer Access:** Buyers scan QR codes to verify authenticity, freshness, and ethical sourcing.

### **Task 4: Reflection Report: Blockchain Adoption Benefits and Challenges**

#### **Industry That Will Benefit the Most: Supply Chain & Logistics**

- I believe the supply chain and logistics industry will benefit the most from blockchain technology due to its need for transparency, traceability, and fraud prevention. Blockchain enables real-time tracking of goods, reduces paperwork, and ensures authenticity—critical in industries like food, pharmaceuticals, and luxury goods. For example, IBM Food Trust uses blockchain to track food from farm to shelf, helping quickly identify contamination sources. Similarly, Maersk's TradeLens improves shipping efficiency by digitizing documentation. Blockchain can also combat counterfeit products by verifying provenance, which is vital for pharmaceuticals and high-value goods. The ability to automate processes with smart contracts further reduces delays and costs, making supply chains more resilient.

#### **Challenges in Adopting Blockchain at Scale**

Despite its potential, blockchain faces several adoption challenges:

**Technical Barriers** – Scalability remains a major issue; networks like Bitcoin and Ethereum struggle with slow transaction speeds and high energy consumption. Solutions like sharding and Layer 2 protocols are emerging but need wider implementation.

**Regulatory Uncertainty** – Governments are still defining blockchain regulations, particularly concerning data privacy (GDPR) and cross-border transactions. Compliance hurdles may slow adoption in finance and healthcare.

**Integration with Legacy Systems** – Many businesses rely on outdated IT infrastructure, making blockchain integration complex and costly.

**Resistance to Decentralization** – Traditional industries may hesitate to adopt blockchain due to loss of centralized control and the need for industry-wide collaboration.

**Education & Talent Shortage** – A lack of blockchain expertise slows development, requiring more training programs and skilled professionals.

#### **Conclusion:**

While blockchain holds immense potential—especially in supply chains—its large-scale adoption depends on overcoming technical, regulatory, and cultural barriers. As scalability improves and regulations mature, industries will increasingly leverage blockchain for security, efficiency, and trust.



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