

Task 2

Choose one platform from each category:

- Public Blockchain: (e.g., Ethereum, Bitcoin, Solana)
- Private Blockchain: (e.g., Hyperledger Fabric, R3 Corda in private mode)
- Consortium Blockchain: (e.g., R3 Corda, Quorum, IBM Food Trust)

1. Create a comparison table or markdown sheet with the following columns for each platform:

Blockchain Name	Type	Consensus Mechanism Used	Permission Model	Speed / TPS	Smart Contract Support	Token Support	Typical Use Case	Notable Technical Feature
Ethereum	Public	Proof of Stake (PoS - Ethereum 2.0)	Open	~15–30 TPS	Yes (Solidity, Vyper)	Native (ETH)	Decentralized apps (DeFi, NFTs)	Strong developer ecosystem & EVM support
Hyperledger Fabric	Private	Pluggable (e.g., Raft, Kafka)	Permissioned	~1000+ TPS	Yes (Chaincode in Go, Java, Node.js)	No	Enterprise supply chains	Modular architecture & private channels
R3 Corda	Consortium	Notary nodes (not full consensus)	Permissioned	~170–600 TPS	Yes (Kotlin, Java)	No	Interbank and trade finance	Legal contract modeling & privacy

2. Write a Short Report (150–200 words):

Feature	Ethereum	Hyperledger Fabric	R3 Corda
Type	Public	Private	Consortium
Consensus Mechanism	Proof of Stake (PoS)	Pluggable (e.g., Raft, Kafka)	Notary-based (validity + uniqueness checks)
Permission Model	Open	Permissioned	Permissioned
Throughput (TPS)	~15–30 TPS	~1000+ TPS	~170–600 TPS
Smart Contract Support	Yes (Solidity, Vyper)	Yes (Chaincode in Go, Java, Node.js)	Yes (CorDapps in Kotlin/Java)
Token Support	Native (ETH), supports ERC-20	No native token	No native token
Data Privacy	Low – all data public	High – private channels	Very high – shared only between parties
Architecture	Monolithic	Modular	Peer-to-peer flow-based

Use Case Focus	Open finance, NFTs, dApps	Supply chain, enterprise	Finance, legal, regulated institutions
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1. A Decentralized App (dApp):

Chosen Platform: Ethereum

Justification:

- Ethereum is a public, permissionless blockchain, designed to support decentralized applications (dApps).
- It offers robust smart contract capabilities using Solidity and Vyper, and operates on the Ethereum Virtual Machine (EVM).
- The platform has a large developer ecosystem, extensive documentation, and widespread adoption in DeFi, NFTs, DAOs, and more.
- Though base throughput is moderate (~15–30 TPS), Layer 2 scaling solutions (e.g., Polygon, Arbitrum, Optimism) significantly enhance performance.
- Its global accessibility and decentralization make it the best fit for applications targeting an open user base without a central authority.

2. A Supply Chain Network Among Known Partners:

Chosen Platform: Hyperledger Fabric

Justification:

- Hyperledger Fabric is a permissioned, enterprise-grade blockchain tailored for business networks with known and trusted participants.
- It offers private channels that allow selective data sharing—essential for protecting sensitive supply chain data.
- Its pluggable consensus mechanism (e.g., Raft, Kafka) and modular architecture provide flexibility to align with different operational policies.
- Fabric supports high transaction throughput (~1000+ TPS), enabling efficient tracking and tracing of goods and processes.
- Its lack of a native cryptocurrency simplifies integration into traditional business models without token economics.

3. An Inter-Bank Financial Application:

Chosen Platform: R3 Corda

Justification:

- R3 Corda is specifically designed for the financial services sector, making it ideal for inter-bank and institutional applications.

- Unlike typical blockchains, Corda does not use global broadcasting. Instead, it enables point-to-point data exchange, ensuring confidentiality and scalability.
- It employs a notary service to prevent double-spending and validate transactions without a traditional consensus algorithm.
- Supports legal contract modeling through CorDapps written in Kotlin or Java, ensuring alignment with regulatory frameworks.
- Its architecture is tailored to privacy, auditability, and compliance, which are critical for financial institutions.