

## **TASK-2**

### **Blockchain Platform Comparison:**

<b>Aspect</b>	<b>Polygon (PoS Chain)</b>	<b>Hyperledger Fabric</b>	<b>R3 Corda</b>
<b>Type</b>	<b>Public</b>	<b>Private</b>	<b>Consortium</b>
<b>Consensus Mechanism</b>	<b>PoS + Heimdall (Checkpointing on Ethereum)</b>	<b>Pluggable (e.g., Solo, Raft, Kafka)</b>	<b>Notary-based validation (single or clustered)</b>
<b>Permission Model</b>	<b>Open</b>	<b>Permissioned</b>	<b>Permissioned</b>
<b>Speed / Throughput</b>	<b>~7,000 TPS (on PoS chain)</b>	<b>~1,000–3,000 TPS (config-dependent)</b>	<b>~170–200 TPS (scenario-based)</b>
<b>Smart Contract</b>	<b>Yes (Solidity, EVM-compatible)</b>	<b>Yes (Chaincode: Go, Java, Node.js)</b>	<b>Yes (JVM-based – Kotlin, Java)</b>
<b>Token Support</b>	<b>Native (MATIC)</b>	<b>No native token</b>	<b>No native token</b>
<b>Typical Use Case</b>	<b>Scalable dApps, DeFi, NFT marketplaces</b>	<b>Enterprise data exchange, supply chain, auditing</b>	<b>Interbank financial systems, trade finance</b>
<b>Notable Technical Feature</b>	<b>Ethereum-compatible scaling, low fees</b>	<b>Channel-based privacy, modular pluggable setup</b>	<b>Point-to-point architecture, legal contract ties</b>

### **Technical Comparison:**

#### **Polygon (Public)**

- **High scalability with ~7,000 TPS on the PoS chain.**
- **Consensus: PoS validators with checkpointing to Ethereum via Heimdall.**

- **Smart Contracts:** Full support via Solidity, EVM-compatible.
- **Open network:** Anyone can join, fully decentralized.
- **Low fees and fast confirmation times,** ideal for public dApps.
- **Token support:** Native token MATIC powers fees, staking, and governance.
- **Use cases:** DeFi platforms, NFT marketplaces, games, DAO tools.

### **Hyperledger Fabric (Private)**

- **Pluggable consensus model** allows flexibility (Raft, Kafka, etc.).
- **Permissioned network:** Only verified members participate.
- **Smart Contracts:** Called Chaincode, written in Go, Java, Node.js.
- **High privacy** through channels and private data collections.
- **No native token,** ideal for token-free enterprise applications.
- **Modular architecture** enables component-based customization.
- **Use cases:** Supply chain tracking, enterprise data exchange, audits.

### **R3 Corda (Consortium)**

- **Notary-based consensus** avoids global broadcast, improves efficiency.
- **Permissioned network:** Consortium participants with identity verification.
- **Smart Contracts:** In Java/Kotlin, designed for legal enforcement.
- **Peer-to-peer data exchange** (only relevant parties receive data).
- **No native token,** focus on asset registries, identity, contracts.
- **Strong integration** with legal frameworks and compliance tools.
- **Use cases:** Interbank settlements, trade finance, insurance claims.

## **Platform Recommendations & Justification:**

### **1. For a Decentralized App → Polygon**

- **Why:** High TPS, low gas fees, EVM compatibility, public validator set, open access.
- **Best for:** DeFi, gaming dApps, DAO platforms.

### **2. For a Supply Chain Network Among Known Partners → Hyperledger Fabric**

- **Why:** Private, permissioned control, fine-grained data sharing via channels, enterprise-oriented, high throughput.
- **Best for:** Supply chain tracking, provenance, compliance in logistics.

### **3. For an Interbank Financial Application → R3 Corda**

- **Why:** Point-to-point data sharing, smart contracts tied to legal prose, privacy-centric, built specifically for finance consortia.
- **Best for:** Cross-border settlements, syndicated lending, compliance-heavy financial apps.