Short Report

This report compares the technical capabilities of three prominent blockchain platforms: Ethereum, Hyperledger Fabric, and R3 Corda.

1. **Ethereum:** Instead of using Proof of Work, Ethereum uses Proof of Stake, this makes the network less energy-consuming and more scalable than before. Solidity is the language it supports for smart contracts, which helps developers make decentralized applications (dApps). Even so, since the main chain can only handle about 30 transactions per second, it may get congested when many users are online at the same time. Since Ethereum allows everyone to join, it has built up a big and lively developer community.

2. **Hyperledger Fabric:** Hyperledger Fabric is a private blockchain meant for companies, and it works by using the Practical Byzantine Fault Tolerance (PBFT) system. Since it can process up to 3,500 transactions per second, this network is fit for applications aiming for quick transactions. You can write smart contracts for Hyperledger Fabric using Go, Java, or JavaScript, and only authorized people can gain access to the network since it works on a permissioned basis. With this feature, privacy and security can be ensured within an organization.

3. **R3 Corda:** R3 Corda works as a consortium blockchain that holds transactions secure and private between businesses that are familiar with each other. It runs programs called smart contracts in Java and is intended for finance, only processing about 20 transactions per second. Because just authorized participants can see transaction information with Corda, it is best suited for applications between banks that require privacy.

Comparison Fields	Ethereum	Hyperledger Fabric	R3 Corda
Type	Public	Private	Consortium
Consensus Mechanism	Proof of Stake	Practical Byzantine Fault Tolerance	Notary-based consensus
Permission Model	Open (Public)	Permissioned (Private)	Permissioned (Consortium)
Speed / Throughput (TPS)	~30 TPS	~3,500 TPS	~20 TPS
Smart Contract Support	Yes (Solidity)	Yes (Go, Java, JavaScript)	Yes (Java)
Token Support	Native	Not Native	Not Native
Typical Use Case	Decentralized applications (dApps)	Enterprise solutions	Inter-bank financial applications
Notable Technical Feature	Large developer community	Modular architecture	Strong privacy features

Table 1: Blockchain Platform Comparison Table

Platform Choices

When selecting a blockchain platform for a particular use, it is important to judge it by its technical abilities and performance.

1. **Decentralized App (dApp)**: Ethereum is the most used platform for developing decentralized applications. Because it supports many smart contracts coded in Solidity, and also attracts many active developers, Ethereum offers lots of opportunities for new innovations. Because Ethereum can make use of many decentralized services, it is the best choice for developing dApps.

2. **Supply Chain Network Among Known Partners**: A supply chain network would work best if it uses Hyperledger Fabric. With the ability to handle around 3,500 transactions in a second (TPS), and because partners are permitted to use it, the network is efficient and safe. Since it can be adjusted to match business requirements, this kind of architecture makes enterprise applications more effective.

3. **inter-Bank Financial Application**: Many banks turn to R3 Corda when they need financial solutions because it prioritizes privacy and protection of data. Because of blockchain's consensus mechanism, transactions are kept secret from unauthorized people, which is important for financial security. Since Corda was created for financial use, it is the perfect option for handling these transactions.

– By Mahima Saxena