

SNS COLLEGE OF ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING IOT Including CS&BCT

COURSE NAME : DISTRIBUTED LEDGER TECHNOLOGY TOPIC : Model of Blockchain- Algorand.





Model of Blockchain

What is a Blockchain Model?

A blockchain model defines the structure, consensus mechanism, and functionality of a blockchai network. It determines how transactions are processed, blocks are created, and security is maintained. **Types of Blockchain Models: Public Blockchain**

Open to everyone, fully decentralized.

Example: Bitcoin, Ethereum.

Private Blockchain

Restricted access, controlled by an organization.

Example: Hyperledger Fabric, Corda.

Consortium Blockchain

Controlled by multiple organizations, partially decentralized.

Example: Quorum, R3 Corda.

Hybrid Blockchain

Combines public and private elements.

Example: XRP Ledger, Dragonchain.





Algorand – A High-Performance Blockchain

Why Was Algorand Created?

Traditional blockchains like Bitcoin and Ethereum face challenges such as scalability, high transaction fees, and slow processing times. Algorand was developed by Silvio Micali to address these issues by providing a fast, scalable, and decentralized blockchain.

Core Innovations in Algorand

Instant Finality – Transactions are confirmed in approximately 4.5 seconds, eliminating forks.
Decentralized Randomness – Uses Verifiable Random Functions (VRF) for fair validator selection.
No Minimum Stake Requirement – Any user with ALGO tokens can participate in consensus.
Scalable and Efficient – Processes over 1,000 transactions per second (TPS).
Energy Efficient – Consumes minimal energy compared to Proof of Work blockchains.
How Algorand Stands Out

Unlike Ethereum, Algorand does not require expensive staking or mining. It provides a fair, permissionless participation model where all token holders can validate transactions. Designed to support large-scale applications in finance, supply chain, and decentralized applications.





How Algorand Works

Algorand's Pure Proof of Stake (PPoS) Mechanism

Instead of miners, Algorand selects validators randomly based on their stake. This ensures fairness, security, and decentralization.

Steps in Algorand's PPoS Consensus:

Proposal Stage:

A random user is selected to propose a new block.

Selection is based on the amount of ALGO (Algorand's token) held. **Soft Vote Stage:**

A committee of randomly selected token holders votes to filter invalid proposals. **Certify Vote Stage:**

Another committee finalizes the block and adds it to the blockchain. **Finality**:

Transactions are confirmed within seconds, ensuring instant settlement. **Use Cases of Algorand:**

Decentralized Finance (DeFi) – Supports stablecoins, lending, and trading. **NFTs & Tokenization** – Enables creation and transfer of digital assets. **Cross-Border Payments** – Fast and cost-effective global transactions. **Enterprise & Government Solutions** – Used for identity management and supply chain tracking.

