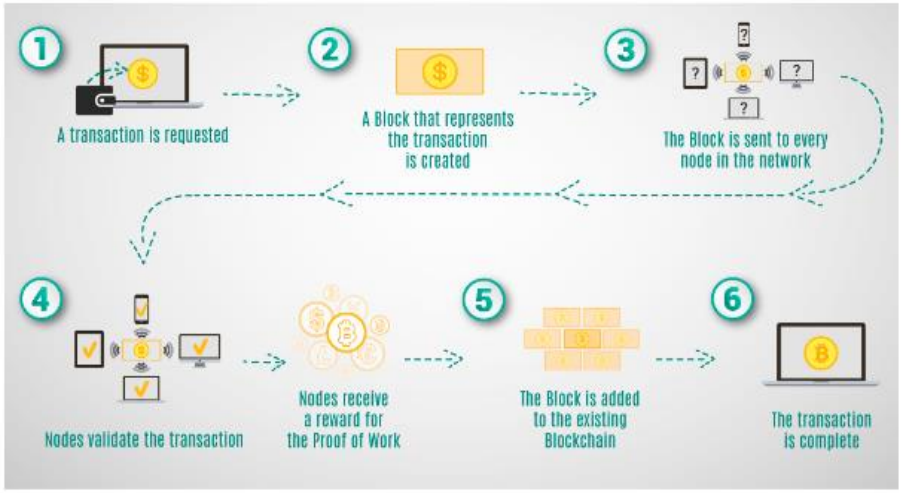
Project Design Phase-II

Technology Stack (Architecture & Stack)

Date	12 Oct 2023
Project Name	Blockchain-Powered Library Management

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2



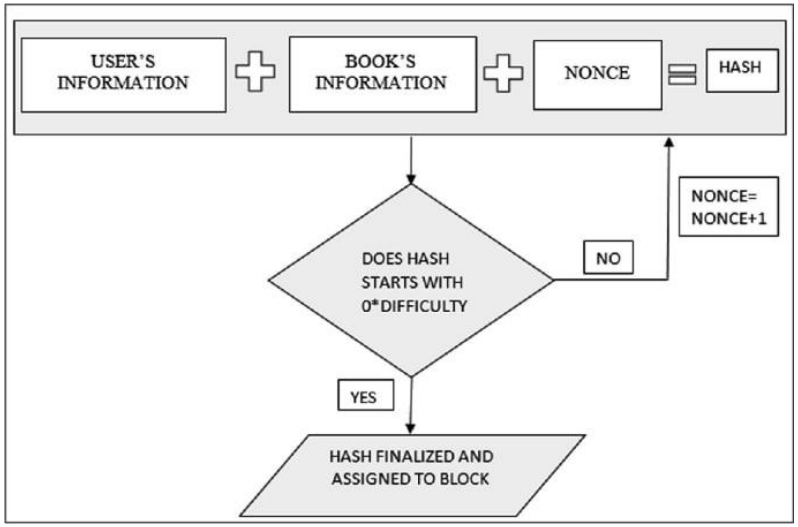


Table-1: Components & Technologies:

S No	Component	Description	Technology
1.	User Registration	This component allows users to register for the system, defining their roles and permissions.	React.js for the user interface, Solidity for smart contracts, and Metamask for wallet integration.
2.	Resource Catalog	This component allows librarians to catalog and manage library resources, adding metadata such as title, author, and ISBN.	React.js for the user interface, Solidity for smart contracts, and IPFS for decentralized storage.
3.	Resource Tracking	Patrons can use this component to search for available resources, borrow books, and return them, with real-time tracking of availability.	React.js for the user interface, Solidity for smart contracts, and Ethereum for blockchain functionality.
4.	User Dashboard	This provides a user-friendly dashboard for patrons to manage their borrowed resources, view due dates, and interact with the system.	React.js for the user interface and Web3.js for interacting with the Ethereum blockchain via Metamask.
5.	Security and Permissions	This component manages user access control, ensuring role-based permissions and protecting sensitive data.	Solidity for smart contracts to enforce access control, React.js for user interface, and Metamask for user authentication.
6.	Blockchain Integration	This core component integrates with the Ethereum blockchain, including the creation and management of smart contracts.	Solidity for smart contracts, Web3.js for connecting to Ethereum, and Metamask for wallet integration.

Table-2: Application Characteristics:

S No	Characteristics	Description	Technology
1.	Decentralization	The system operates on a decentralized blockchain network, removing the need for a central authority, thereby ensuring data integrity and user trust.	Ethereum blockchain for decentralization, Solidity smart contracts.
2.	Immutability	Once data is recorded on the blockchain, it cannot be altered or deleted, ensuring the integrity of library records.	Blockchain technology (e.g., Ethereum) for data immutability.
3.	Transparency	The system provides transparent access to library resources and transactions, enhancing accountability and user confidence.	Blockchain for transparent ledger, React.js for user interface.
4.	Security	The system prioritizes data security through encryption, access control, and decentralized storage, protecting user and library data.	Data encryption, blockchain for access control, Solidity smart contracts.
5.	Data Privacy	The system prioritizes data privacy by implementing stringent measures to protect sensitive user and library information.	Data encryption, access control, and blockchain for privacy.