

## **PROBLEM & PROBLEM UNDERSTANDING**

### **Specify the business problem**

#### **Specification of business problem:**

The business problems in implementing the block chain powered library management in traditional libraries is the cost effective adoption and integration of the technology. This includes costs associated with developing or acquiring block chain infrastructure, implementing ethereum smart contracts , training staff and maintaining the system over time.

The problems are;

- Cost of implementation
- Scalability
- Data privacy
- User adoption
- Interoperability
- Regulatory and legal issues
- Smart contracts
- Backup and recovery
- Energy consumption
- User support

#### **Secure cataloguing:**

1. Block chain platform (ethereum)
2. Smart contracts

This ensure that transactions are secure, transparent and tamper-proof

3. Data structure

This stores the library information about ilibrary items

4. Decentralized storage

This ensures content availability and reduces the risk of data loss.

5. Transaction verification

Proof of work, proof of stake can be chosen based on platform

6. User authentication and permission Public key private key utilization

7. Immutable ledger

8. Search and retrieval interface

9. Audit trail and reporting

## 10. Regular updates and maintenance

### **Efficient borrowing and returns:**

**Block chain Smart Contracts:** Create smart contracts that record each book's ownership and due date. When a user borrows a book, a smart contract is created, specifying the due date and the user's information.

**Automatic Due Dates:** The due date for each book is automatically set in the smart contract based on predefined rules. This could be a standard loan period or customized for each user.

**Late Fees:** If a book is returned after the due date, the smart contract can automatically impose late fees. Users can view the late fees associated with their account in real-time.

**Real-Time Availability Status:** Implement a system that updates the availability status of each book in real-time on the block chain. When a user checks out a book, its status changes to "unavailable," and when returned, it becomes "available" again.