



SMART INDIA  
HACKATHON  
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# TEAM - SPARK SQUARD

**Problem Statement** Blockchain Track

**Problem Statement Title:** Developing a Work Order Management DApp for a Government College using Sign Protocol and Avail.

**Team Name:** Spark Squard

**Team Leader Name:** Devanshu Raj

**Members:** Simran  
Keshav  
Vishal  
Somya  
Ishita

**Institute Name:** Netaji Subhas university of technology

# PROBLEM

**Government colleges often face challenges in managing work orders due to the involvement of multiple departments, vendors, and layers of approval. The traditional paper-based or centralized digital systems can lead to issues such as:**

**Lack of Transparency:** The process of managing and approving work orders is often opaque, leading to potential misuse, delays, and lack of accountability.

**Inefficient Process:** The approval and execution of work orders can be slow and cumbersome, with the need for manual verification and coordination across departments.

**Risk of Fraud:** The authenticity and integrity of work orders can be compromised, with possibilities of tampering, unauthorized modifications, or forgery

**Data Availability:** In a centralized system, data availability and integrity can be compromised in case of system failures or security breaches. Ensuring data is consistently accessible and reliable is a critical challenge.



# PROPOSED SOLUTION- ABOUT THE BLOCKCHAIN

- Our proposed solution is a custom blockchain-based Decentralized Application (DApp) designed specifically for work order management in a government college setting. Built using Go for the backend and React for the frontend, this DApp enables users to add, track, and approve work orders efficiently while issuing certificates and facilitating auctions.

## **Work Order Management:**

All work orders are added as blocks to the blockchain, ensuring a transparent and immutable record of all transactions. Users can easily track the status of work orders in real-time, enhancing accountability and efficiency.

## **User Roles:**

The DApp supports two primary roles: Admin and Vendor. Admins have the authority to create and manage work orders, while vendors can view, accept, and complete assigned tasks.

## **Cost Efficiency:**

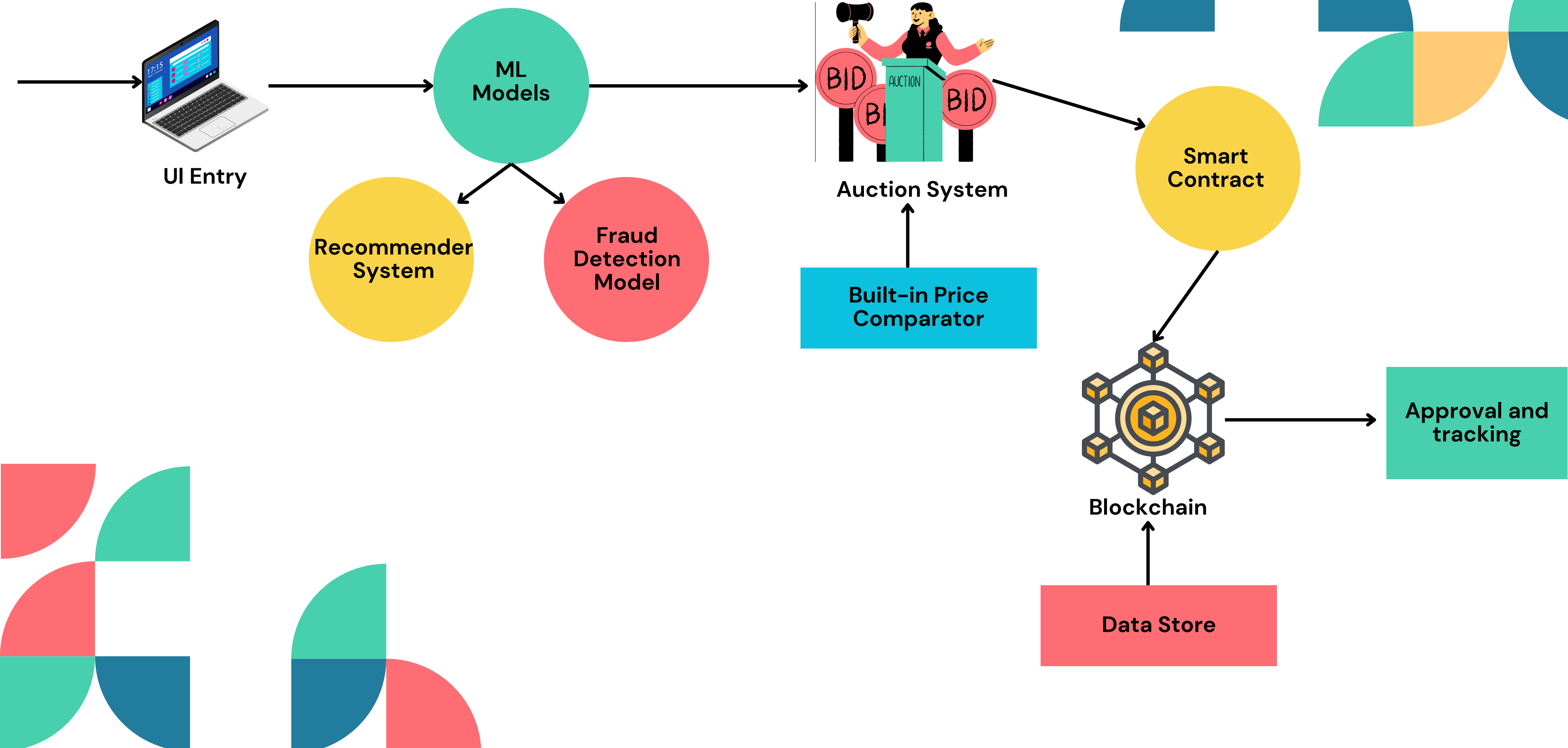
By utilizing a custom blockchain, the DApp eliminates the need for traditional transaction fees (gas fees) typically associated with adding work orders, resulting in significant cost savings.

## **Auction Functionality:**

Auctions for work orders are implemented as a block, allowing vendors to bid on projects transparently. The auction process is recorded on the blockchain, ensuring fairness and traceability.



# SYSTEM FLOW



# TASKS ACCOMPLISHED

1

Made D-App on our own blockchain to leverage security as well as privacy

2

On-chain verification with Sign Protocol

3

Complete Work-Order Cycle Management, including creating, approving and tracking work orders.

4

Secure and Authentic issuance and verification of certificates

5

Built an auction system with Avail

6

Role Based access control for admin-staff and vendors

7

**Bonus:**  
Recommendation system and price comparator for ease of use

8

Extremely user friendly interface

9

Fraud Detection to ensure authenticity of user

# FRAUD DETECTION MODEL

The primary goal of this fraud detection model is to identify fraudulent transactions in a financial system. By analyzing multiple facets of user behavior, transaction patterns, and historical data, the model can flag potentially suspicious activities with higher accuracy. If fraudulent activity is identified then the user may not use our platform. Some of the features it considers:

## **Blockchain Transactions:**

Captures the fundamental transaction data such as amounts and fees, which are directly relevant to detecting anomalies or irregularities in financial transfers.

## **User Profile:**

Provides critical user information like KYC status, which helps assess the legitimacy of the user and their transactions.

## **SystemAndPlatformScores:**

Evaluates system trust scores and platform reliability, which are vital for understanding the overall security environment of the transactions.

## **CreditAndFinancialHistory:**

Includes credit scores and financial history, providing insights into the financial behavior of users, which is crucial for assessing risk.



# BUSINESS MODEL

## Subscription Fees:

Offer the dApp as a subscription-based service to government colleges and educational institutions.

## Transaction Fees:

Charge a small fee per transaction or auction conducted on the platform. This could be a percentage of the transaction value or a flat fee.

- **Applicability:** This fee would apply to vendors participating in auctions or submitting bids, ensuring that they contribute to the platform's maintenance and development.

## Data Access Fees:

Offer access to aggregated and anonymized market data for research, trend analysis, and benchmarking purposes. Educational institutions and vendors could subscribe to this data service.

## White-Label Solutions:

Offer a white-label version of the dApp that can be customized with the branding of different government agencies or educational institutions.

- **Revenue:** Charge a premium fee for customization, deployment, and ongoing maintenance of these white-label solutions.

# SUMMARY REPORT

- **Hybrid Recommender System:** The recommendation system suggests goods and services to users based on their previous interactions, work order information, and vendor profiles. It aims to improve procurement efficiency by offering relevant recommendations, thereby reducing search time and ensuring optimal choices.
- **Built-in Price Comparator:** The price comparator assists users by comparing the costs of new and used lab equipment, as well as new furniture and electronics. This tool helps in making informed purchasing decisions by providing a clear comparison of prices across various vendors.

- **Blockchain Technology:** The blockchain is the backbone of the dApp, serving as a decentralized and immutable ledger that records all transactions, work orders, and certificates. Each transaction is securely encrypted and stored across a distributed network of nodes, ensuring transparency, security, and tamper-proof records.
- **Fraud Detection Model:** The fraud detection model is a critical component of the dApp, designed to identify and prevent fraudulent transactions. By analyzing a wide range of data points, the model can detect suspicious activities with high accuracy, protecting the integrity of the system.







# SUMMARY

This custom blockchain-based DApp presents a cutting-edge solution for work order management in a government college context. By combining the benefits of blockchain technology with a user-friendly interface, it enhances transparency, efficiency, and security in managing work orders, issuing certificates, and conducting auctions. The decentralized work order management dApp is designed to streamline and secure government college operations, integrating blockchain, AI, and decentralized technologies.

