

Advancing Land Management in Bangladesh: A Comprehensive Blockchain-Based System for Efficient, Transparent, and Secure Land Management

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BACKGROUND

- Bangladesh, 148,460 sq km, 173M population, seeks efficient land management amid growth.
- Urban expansion shifts farmlands; archaic record-keeping complicates ownership.
- Blockchain digitizes land records, promises secure, transparent management system.

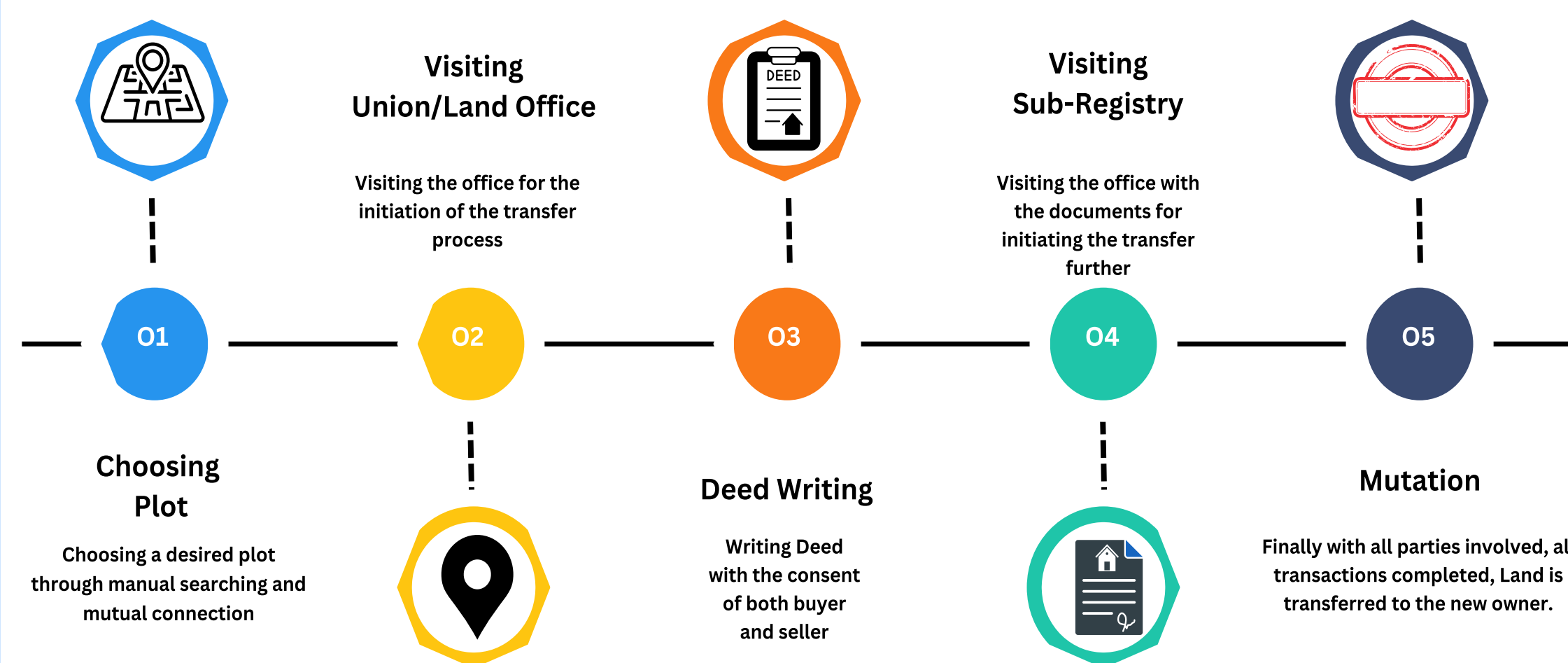


Fig1 :Traditional Land Management

OBJECTIVES

- Evaluate efficiency gains
- Compare with conventional methods
- Assess improvement in honesty and reliability
- Evaluate storage reliability and resistance to manipulation
- Assess the role of governmental organizations and legal authorities
- Analyze the impact and automation of smart contracts
- Examine the immutability and decentralization of blockchain

MOTIVATION

- Few features that are essential for a block chain-based Land management :Price Control, Transparency, Privacy, Smart Contact, Security, Dapps.

Paper Name	A Smart Contract Approach in Pakistan Using Blockchain for Land Management [1]	A Novel Framework for Implementation of Land Registration and Ownership Management via Blockchain in Bangladesh [3]	A Blockchain-based Land Title Management System for Bangladesh[4]	A Blockchain Based Land Registration and Ownership Management System for Bangladesh[5]	LANDCHAIN: A Blockchain-Based Lightweight Land Administration System for Bangladesh [6]	Land records on blockchain for implementation of Land Titling in India [9]	Advancing Land Management in Bangladesh: A Comprehensive Blockchain-Based System for Efficient, Transparent, and Secure Land Transactions
Features							
Price Control	✓	✗	✓	✓	✓	✗	✓
Transparency	✓	✓	✓	✓	✓	✓	✓
Privacy	✓	✓	✓	✓	✓	✓	✓
Smart Contact	✗	✓	✓	✓	✗	✓	✓
Security	✓	✓	✓	✓	✓	✓	✓
Dapps	✓	✗	✗	✗	✓	✓	✓

Fig2 :Feature Comparison

METHODOLOGY

Proposed Model

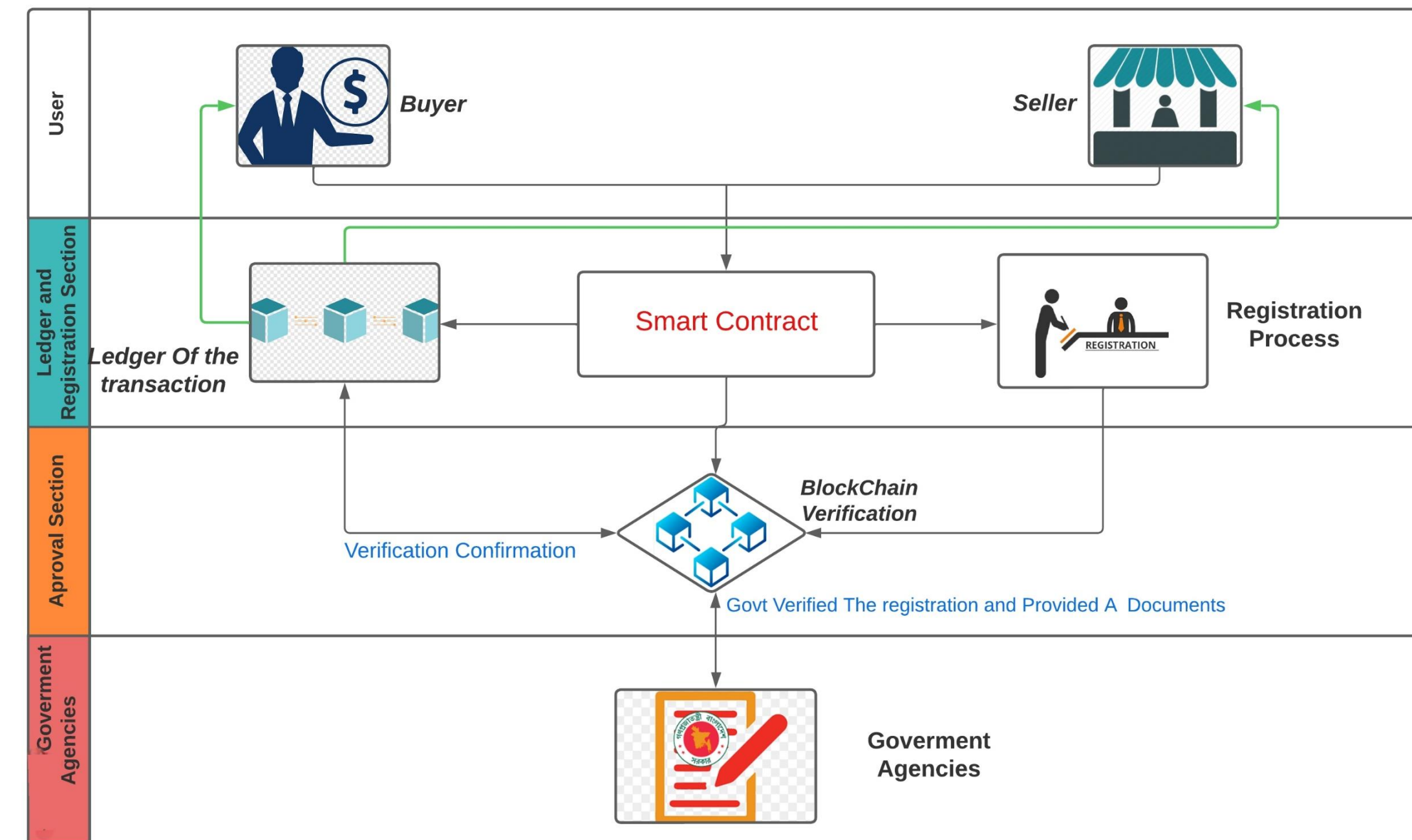


Fig3 :Proposed Model

Dataflow Model

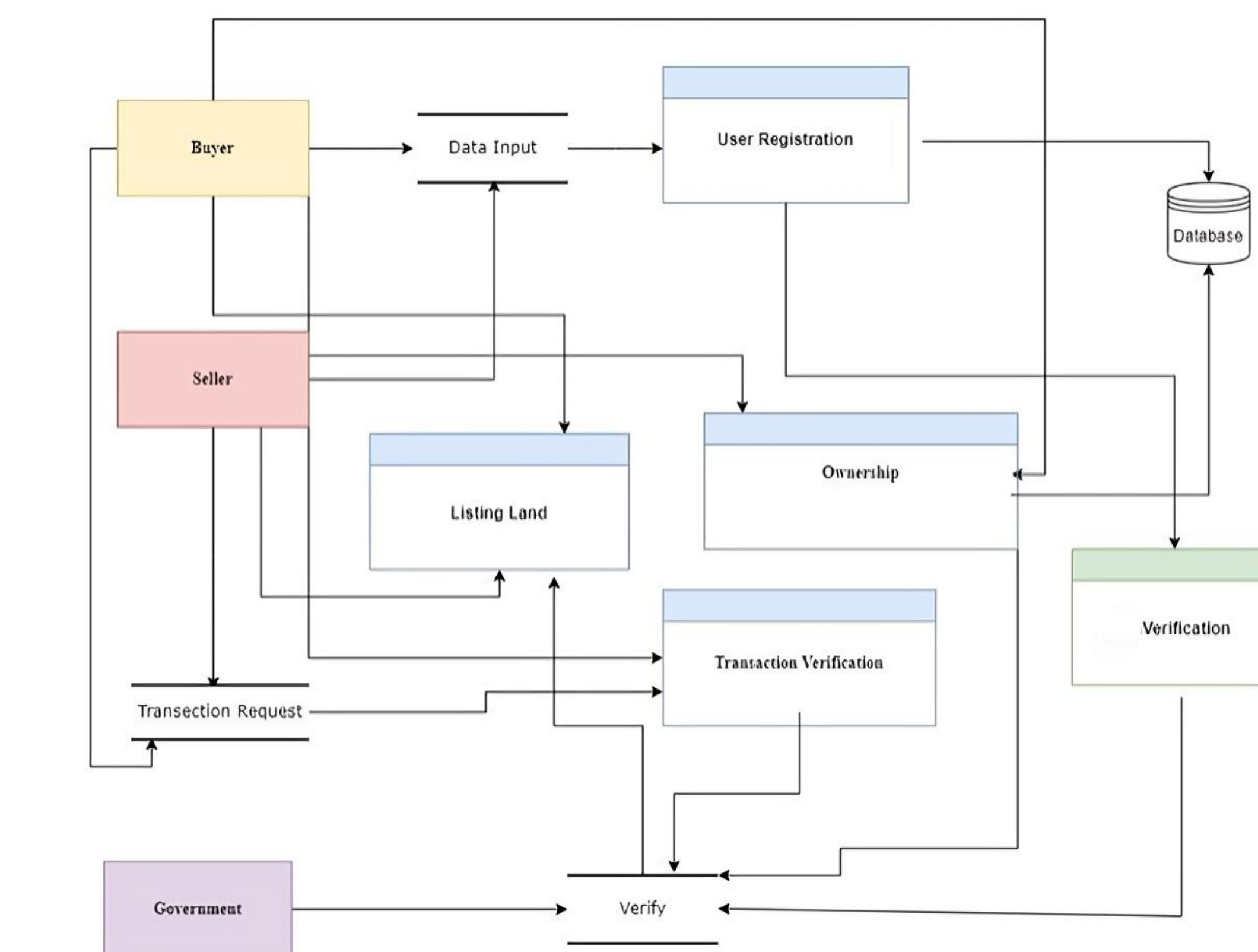


Fig4 :Dataflow Model

System Architecture

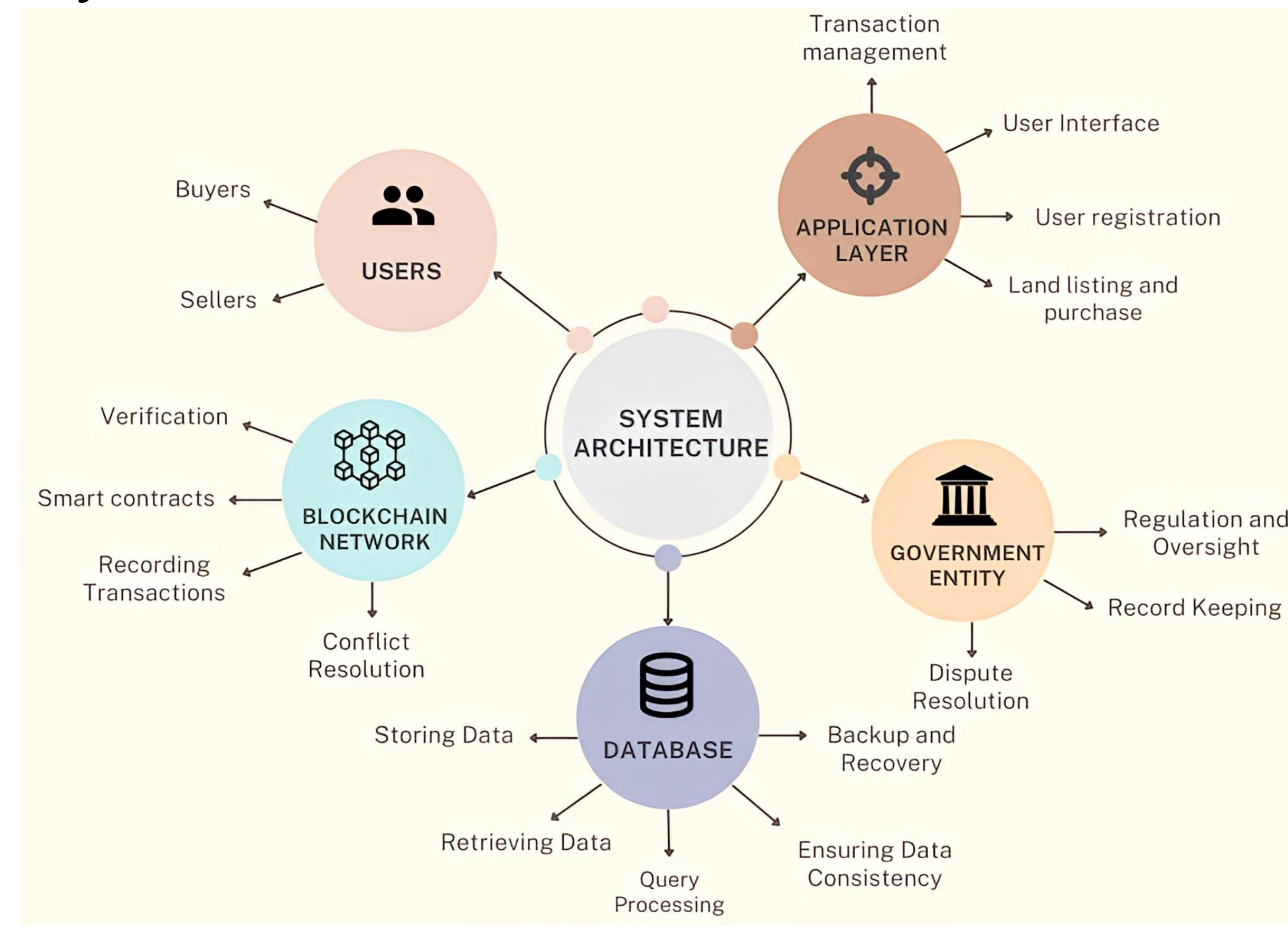


Fig5 : System Architecture

Smart Contracts

isAdmin()	getRequesterDetail()
registerLand()	isAvailable()
setUserProfile()	getOwnerOwns()
markMyPropertyAvailable()	getRequestedLands()
RequestForBuy()	getUserProfile()
AcceptRequest()	getIndices()
getLandDetails()	didRequested()

Table 1 : Listed Smart Contracts

RESULT & DISCUSSION

Cost Estimation of Smart Contracts

Transaction Name	Deployed Gas	Cost(\$)	Cost in Either
Set User Profile	151559	13.19	0.005153
RegisterLand	314146	27.35	0.010609
Request For Buy	191425	16.66	0.006509
Accept Request	167290	14.56	0.005688
Marked property Availavle	58294	5.08	0.0019819
Add Admin	137646	11.98	0.0046799

Table 2 : Cost of using Smart Contacts

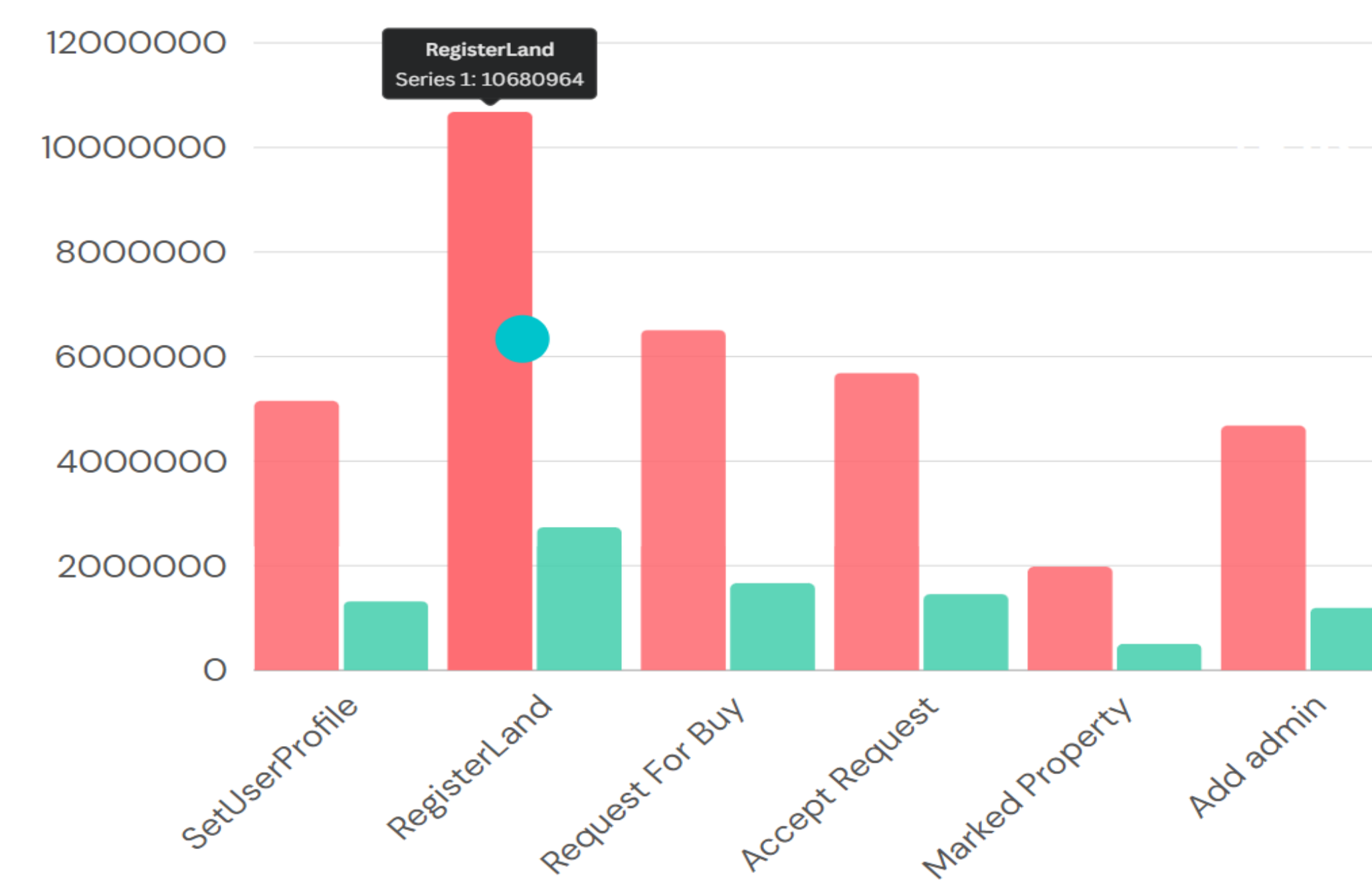


Fig6 : Gas Price on each Transaction

DApp Preview

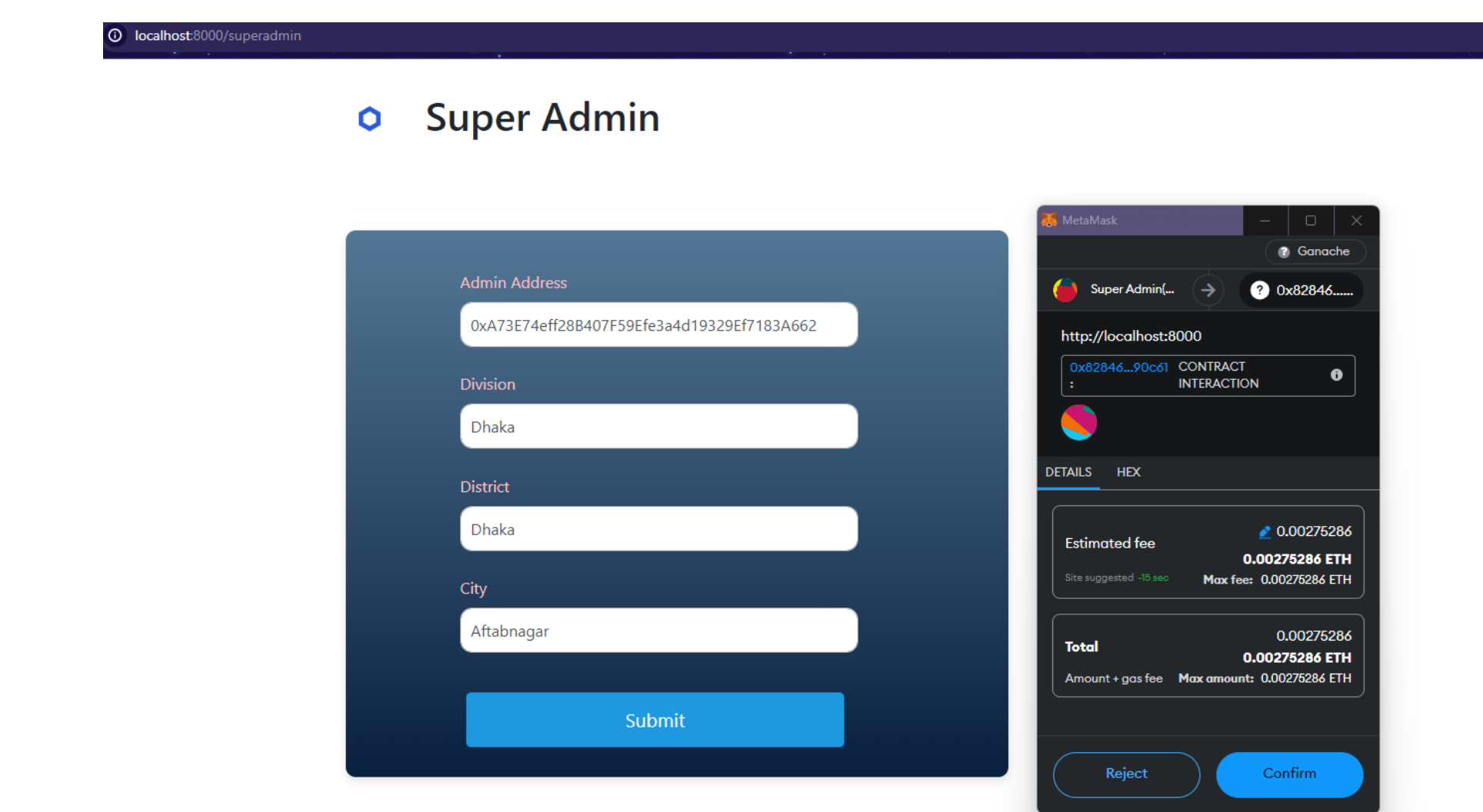


Fig7 : Super Admin Allocating admins according to region



Fig7 : Some preview of the app

Discussion

Proposal: Overhaul Bangladesh's land management using blockchain for transparency and efficiency
Framework: Multi-layered blockchain network with energy-efficient consensus
Challenges: Technical integration, initial costs, security, privacy concerns, resistance to change

CONCLUSION

- Blockchain model enhances land transaction speed & ownership changes.
- Smart contracts automate real estate processes for efficiency.
- Transparency & immutability of blockchain reduce fraud.
- Inclusion of legal entities ensures compliance & legality.