

SYNOPSIS ON:

**SECURE LAND REGISTRY REPOSITORY USING BLOCKCHAIN
TECHNOLOGY.**

PROJECTEE

CHEGE MWAURA

PROJECT SUPERVISOR: Ms Dinda Wilkister



DEPARTMENT OF COMPUTER SCIENCE AND INFORMATICS

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Project Title :

SECURE LAND REGISTRY REPOSITORY USING BLOCKCHAIN TECHNOLOGY.

Problem definition:

Traditional land registry systems face significant challenges like fraud, corruption, data tampering, and inefficiency, which blockchain technology aims to resolve through decentralization and immutability. These issues often stem from centralized databases vulnerable to hacking, human error, lost records, and opaque processes that enable double-selling of properties or forged titles

General Objective

1. Develop a tamper-proof system that ensures immutable, transparent land ownership records using blockchain's distributed ledger and smart contracts.

Specific Objectives

1. Eliminate fraud and double-selling by cryptographically securing titles, preventing unauthorized alterations.
2. Streamline transactions via automated smart contracts for faster, paperless ownership transfers without intermediaries.
3. Enhance accessibility and verification, allowing real-time public audits of transaction histories while maintaining privacy

Proposed Plan of Work:

Week	Dates	Phase	Activity	Status
01	12 Jan - 19 Jan 2026	Allocation	Project Topic Allocation	Completed
02	23 Jan - 28 Jan 2026	Ideation	Topic Review and Synopsis Submission	Completed
03	02 Feb - 10 Feb 2026	Planning	Planning and Requirement gatherings	Completed
			Learning basic of Blockchain and NodeJS	Completed
05	11 Feb - 25Feb 2026	Development	Work on Frontend	Almost
06	28 Mar - Mar 2026		Work on Backend	Pending
07			Integration of Blockchain API	
08			Creation of Solidity Code and Deploy on Polygon	
09		Testing	Testing and Debugging of Application	
10		Report	Report Writing	

Methodology:

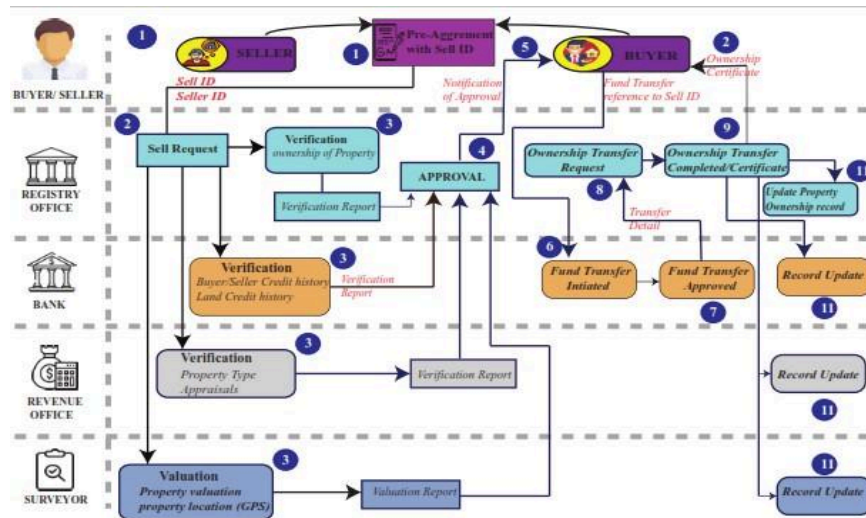


Figure 1: Process Flow for Land Registry using Blockchain

The overall process flow for the proposed system is depicted in Figure 1. It describes the following steps:

Step 1: Pre-agreement - The seller and buyer sign a pre-agreement title contract that contains information such as the seller and buyer IDs, sell ID, amount of transfer, and payment status.

Step 2: Sell request - The pre-agreement title contract is sent to the registry office for a sell request. The system puts a lock on the specific land title to prevent double spending until the approval or disapproval is received from the registry office.

Step 3: Verification - The registry office sends ownership and dues verification and validation requests to the bank, revenue department, surveyor, and registry office. The surveyor provides validation and a report of the property geometry. The bank provides verification and a report of the credit history of the buyer, seller, and property. The revenue department provides verification and a report of the type of property and appraisals. The registry office notifies all departments and sends the blockchain hash to each department.

Step 4: Approval - The registry office receives information from all departments and verifies the data.

Step 5: Notification - After receiving positive verification reports, the registry office notifies the buyer that ownership verification has been verified and asks them to sign the agreement digitally. Otherwise, the request is disapproved.

Step 6: Initiate fund transfer - The system tracks the amount listed in the pre-agreement to be transferred to the bank by the buyer.

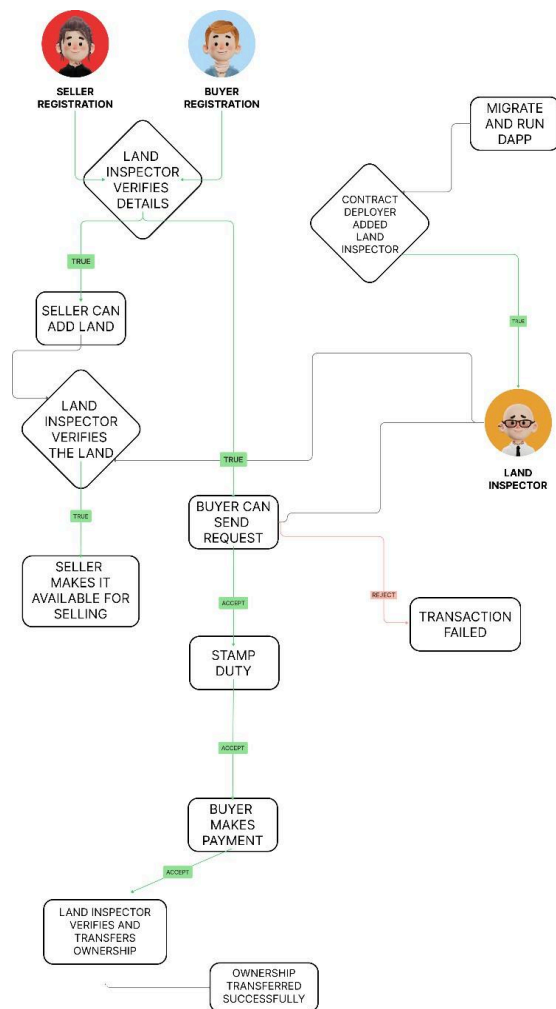
Step 7: Approve fund transfer - The bank checks the fund transfer with reference to the pre-agreement title contract and approves it, marking the payment as received on the pre-agreement title contract.

Step 8: Transfer detail - The bank sends the transfer details to the registry office.

Step 9: Ownership transfer - The registry office approves the ownership transfer request and notifies the seller and buyer about the land title transfer. The recording office in the registry office changes the ownership records.

Step 10: Ownership certificate - After transfer, the registry office generates an electronic title deed with blockchain hash and QR code to the buyer, providing them with an ownership certificate.

Step 11: Record update - The ownership transfer certificate is updated with the blockchain hash to all departments in the land registry system.



Technology:

- NextJS
- Polygon Technology
- IPFS
- Metamask
- NodeJS
- Remix
- Emotion CSS

Functional Specifications (Deliverables):

- A functional model for a sharable land records repository that can determine land ownership, resolve disputes, and collect revenue for the Indian Revenue System.
- A web-based platform that integrates blockchain technology to secure land ownership records for the Indian Revenue System, offering transparency, immutability, and security.
- A dataset of verified land records that are accurate and up-to-date, enabling efficient land transactions and minimizing the risk of fraud.
- A research paper that highlights the benefits of the developed blockchain-based solution and presents the project's methodology, results, and conclusions, which can be published in a conference or journal.

Roll No.	Name	Signature	Project Guide
	Chege Mwaura		Ms Dinda Wilkister

Project Scope:

Accelerating the process of land registration as well as reducing fraud. Depending on its purpose, it may be used to prove ownership, existence, exchange, or transaction of an item. It allows for Transparency in Smart Contracts as well as allowing for the tracing of ownership records back to their inception by virtue of Smart Contracts.

Ms Ndinda Wilkister
Project Supervisor, CSE

Ms Ann Odimba
Head of Department, CSI

References:

- Ledger Layer: Distributed database storing land titles as tamper-proof blocks, validated by consensus mechanisms like Proof-of-Stake.
- Smart Contract Layer: Automates ownership transfers, fraud checks, and dispute resolution without intermediaries.
- User Interface Layer: Web/mobile portal for stakeholders (owners, buyers, officials) to submit/query records, with role-based access.
- Integration Layer: Links to existing systems like Kenya's Ardhisasa for hybrid adoption, plus APIs for verification