



CASE STUDY ON

**BHOOMI**

The Digital Land Record System in Karnataka

# AGENDA

1	INTRODUCTION
2	GOING BEYOND COMPUTERIZATION
3	STAKEHOLDERS & BENEFICIARIES
4	LAND REGISTRATION SYSTEM
5	DRAWBACKS OF MANUAL SYSTEM

6	IMPLEMENTATION
7	IMPACT OF BHOOMI
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9	FUTURE ROADMAP
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# INTRODUCTION

An **online platform** for managing land records in the Indian state of Karnataka.

Established in **2000** with the aim of **digitizing land records**, **reducing corruption**, and **enhancing transparency** in the process of land transactions.

# INTRODUCTION

The land records in Karnataka State were previously kept manually by 9,000 village accountants, each of whom served a group of three to four villages.

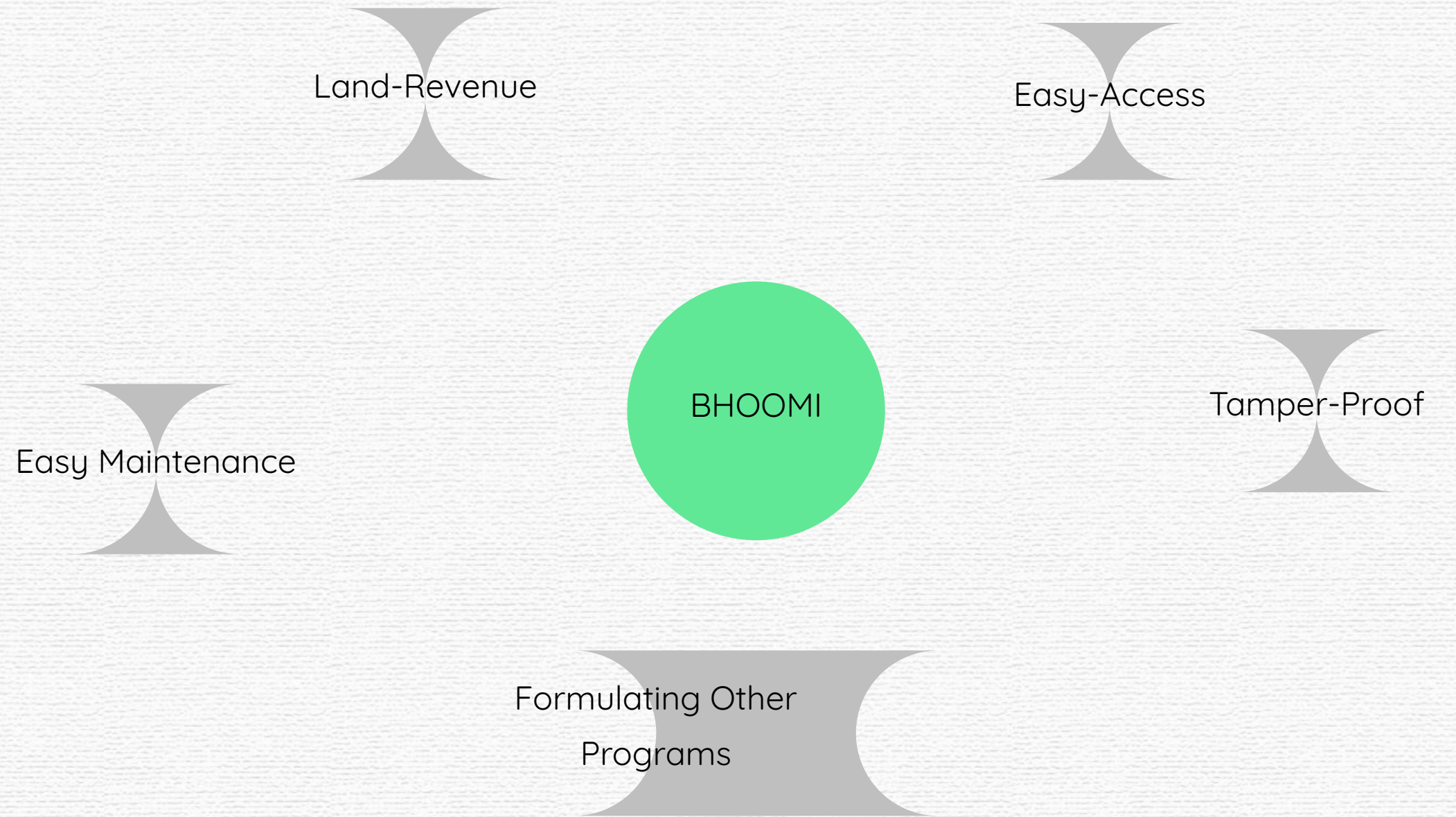
In Karnataka, about 2,500 bank branches annually lend farmers working money totaling about Rs. 40 billion.

BHOOMI introduced **Computerized Land Records Management** in Karnataka to improve **openness, efficacy, and ease** in land record maintenance.

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Through this initiative, Revenue Department in Karnataka has computerized **200 lakh records** of land ownership of **67 lakh farmers** in the state.

# GOING BEYOND COMPUTERIZATION

Not Just Computerization of Land  
Records

BHOOMI integrated with two other sub-systems: **KAVERI** and **BHOOSWADEENA**



# GOING BEYOND COMPUTERIZATION

## KAVERI

An online system developed under the Bhoomi project for property registration and management in Karnataka.

# GOING BEYOND COMPUTERIZATION

**KAVERI**

Allows users to access **land registration services** and check **property details**, including **ownership** and **encumbrances**.

# GOING BEYOND COMPUTERIZATION

**KAVERI**

Kaveri is integrated with Bhoomi to ensure the **accuracy** and **consistency** of land records data.

# GOING BEYOND COMPUTERIZATION

## KAVERI

in 2010, Kaveri-Bhoomi was tested in 5 taluks

Implemented later, covering 244 out of 247 Sub Registers Offices and spanning more than 200 taluks.

# GOING BEYOND COMPUTERIZATION

## BHOOSWADEENA

A **module** of the Bhoomi project that is designed to manage the process of **issuing land ownership certificates**.

# GOING BEYOND COMPUTERIZATION

**BHOOSWADEENA**

Access land records and apply for **ownership certificates** online, eliminating the need to **physically visit government offices**.

# GOING BEYOND COMPUTERIZATION

## BHOOSWADEENA

Enables the government to issue digitally signed and authenticated ownership certificates, ensuring the authenticity and integrity of the land records.

# GOING BEYOND COMPUTERIZATION

**BHOOSWADEENA**

Tested and Implemented in 2011.

Currently, it is running in 52 SRO and 27

LAO in Karnataka.



# STAKEHOLDERS AND BENEFICIARIES

## THE **STAKEHOLDERS** OF THE **BHOOMI PROJECT**

Government of Karnataka

Banks and Financial Institutions

Revenue Department

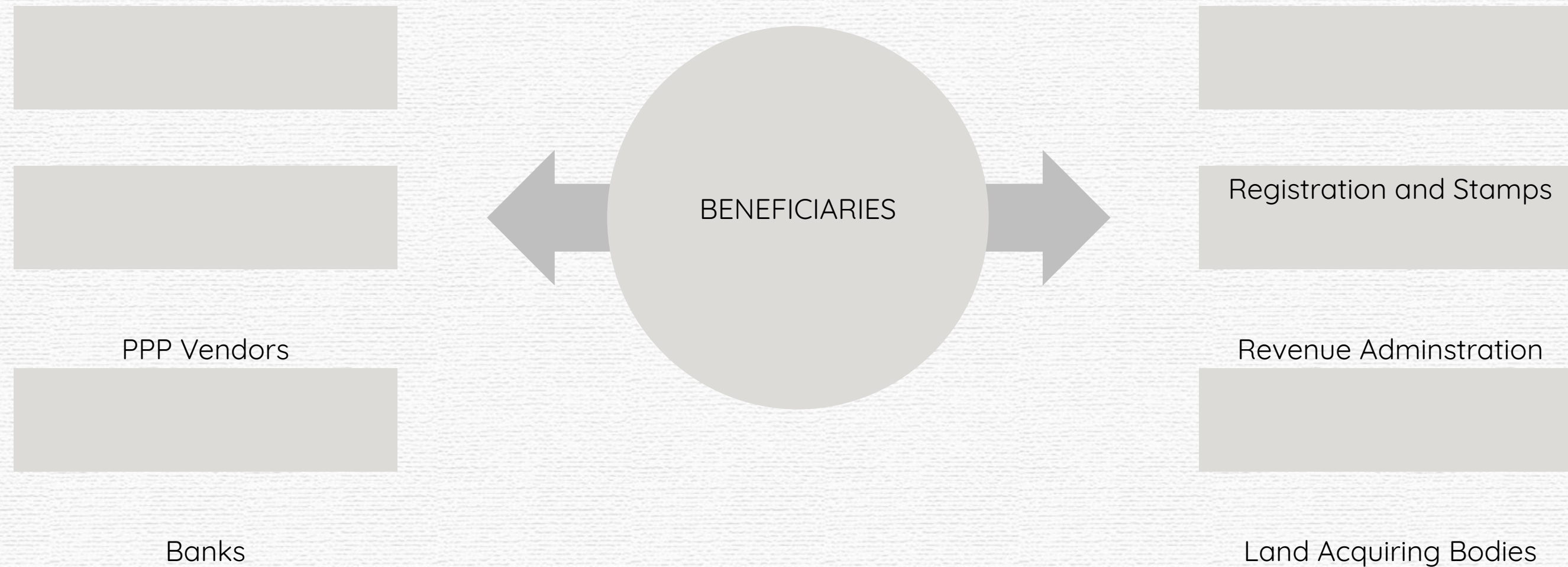
Legal System

Citizens

Surveyors and Mappers

# STAKEHOLDERS AND BENEFICIARIES

## THE BENEFICIARIES OF THE BHOOMI PROJECT



# DRAWBACKS OF MANUAL SYSTEM

- The issue of Land Records depends on the availability, mood, and interest of the V.A/Pattwari
- Large-scale corruption
- The manually writing Land Records may not be legible.

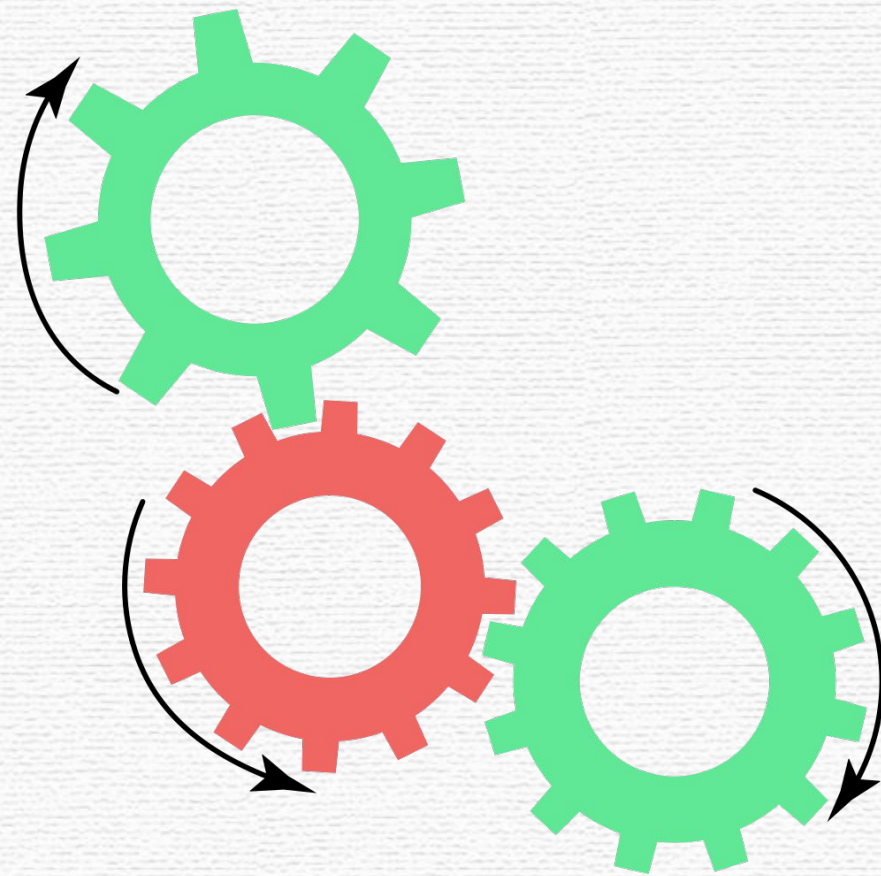
# DRAWBACKS OF MANUAL SYSTEM

- It takes a long time for reproducing Land Records for the succeeding year after incorporating the current **year's crop details, liabilities, and changes in ownership or cultivators** which happen through mutations.
- Very difficult to prepare **cross-tabulated registers or reports**.

# IMPLEMENTATION

Implementation of BHOO MI was done in different phases which incorporate **System Development** and **Integration** of **sub-systems**.

# IMPLEMENTATION - SYSTEM DESIGN & MODELING



In terms of **technology** dependencies and **process** mapping for the **data interchange**, integrating Bhoomi with various existing application software was **difficult**.

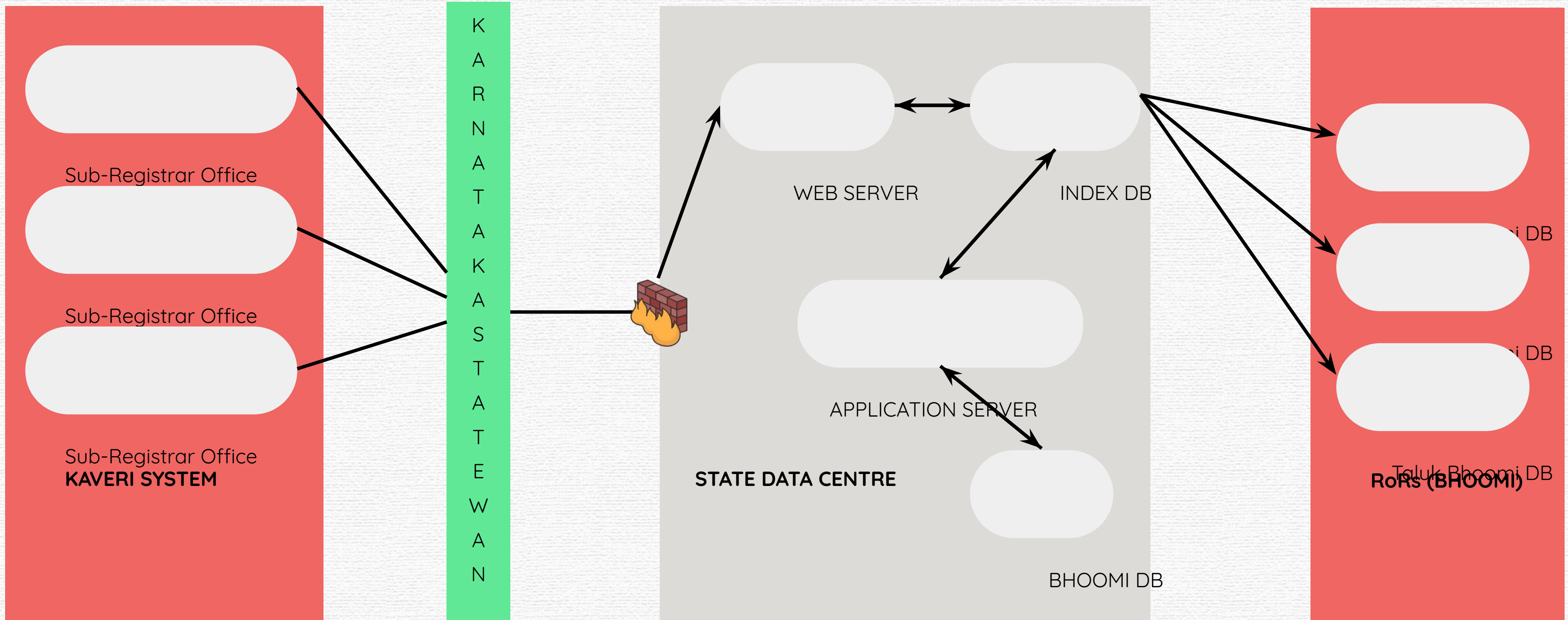
# IMPLEMENTATION - SYSTEM DESIGN & MODELING

# Seamless Interoperability

# Safe Data Exchange

# Secure System Architecture

# IMPLEMENTATION - SYSTEM ARCHITECTURE





# SYSTEM (A) INTEGRATION WITH KAVERI

The System involves performing activities at three locations: the **Sub Registrar's** office, the **State Data Centre**, and **Taluk Bhoomi back office**.

# System (A) INTEGRATION WITH KAVERI

## Sub-Registrar Office

The **KAVERI** application utilizes **web services published by BHOOMI** in the state data center to **enter transaction details** in real-time for land transactions at the sub-register office.

# System (A) INTEGRATION WITH KAVERI

## Sub-Registrar Office

The KAVERI software is developed using VB 6.0 and SQL SERVER 2000 as the backend database.

Windows services and schedulers are employed to poll the web service hosted at SDC for offline XML data transfer.

# System (A) INTEGRATION WITH KAVERI

## SDC - State Data Centre

The State Data Center hosts all the **web services**, **Windows services**, and **schedulers** required for providing ownership details to KAVERI from the BHOOMI database.

# System (A) INTEGRATION WITH KAVERI

## Taluk Bhoomi Back Office

A web service is published to receive XML with complete details of registration transactions from the State Data Center to the taluk server.

## **System (B) INTEGRATION WITH LAO**

The system includes web pages in the presentation layer for LAO/SLAO, with web services in the middle tier handling the business logic and integration with the database.

## System (B) INTEGRATION WITH LAO

- A combination of windows services and web services are being used for transferring requests to respective taluks for processing in BHOO MI and vice-versa.
- Electronic data exchange in the form of signed XML.

## System (B) INTEGRATION WITH LAO

- Digitally signed and bar-coded notification for easy verification by accepting authority
- Automatic initiation of mutation application in BHOO MI on successful verification of XML notification.



## System (C) INTEGRATION WITH BANKS

The solution consists of a **website**, a **scheduled job**, and a **few web methods**.

The website is hosted in the **State Data Centre of GOK** and is used by banks to raise requests for the **creation or release of charges**.

The BHOOMI Monitoring Cell, which has **super administrator privileges**, creates **administrators for individual banks**.

## **System (C) INTEGRATION WITH BANKS**

The application connects to the **BHOOMI database** in SDC to provide banks with ownership details.

After the bank user creates the transaction using BHOOMI data, the software **generates the XML of the transaction** and prompts for a **digital signature**.

Once the XML is digitally signed, it is **stored in the database** at SDC for further processing.

# REVIEW OF TECH STACK

Recently, the application has been updated to **SQL 2000**, with new components of Bhoomi being written on **.Net Framework**.

All components in SDC are written in **.Net 2.0** with **SQL SERVER 2005** as the backend database and hosted on **Windows Server 2003**

# RISK ANALYSIS

It is necessary to ensure **robust reliability**.

Strong **project management** and sustainable **efforts** are required to keep the project rolling even **beyond the implementation** stage.

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# IMPACT OF BHOO MI

**REGISTRATION DEPARTMENT**

**BANKS**

**FARMERS**

**LAND ACQUIRING BODIES**

**REVENUE DEPARTMENT**

**OTHER DEPARTMENTS**

# CHALLENGES DURING IMPLEMENTATION

- Integration Challenge
- Minimizing Inter-dependency
- Herculean Computerization Task
- Technical Capacity Building
- Ensuring Service Continuity and ICT Provisioning
- Data Quality and Accuracy
- Adoption and Acceptance
- Security and Privacy
- Infrastructure and Connectivity
- Cost and Sustainability

# FUTURE ROADMAP

Privacy and Security

Financial Sustainability

Human Sustainability

Political Sustainability



# RECOMMENDATIONS

**1** DECENTRALIZATION

**2** NFT TECHNOLOGY



# RECOMMENDATIONS

## Decentralization Tech in BHOO MI

Decentralizing Bhoomi would involve creating a distributed system of land record management, where the data is stored in multiple locations and managed by multiple authorities.

# RECOMMENDATIONS

## Decentralization Tech in BHOOMI

One possible approach to decentralizing Bhoomi could involve creating a **blockchain-based system** where each node on the blockchain represents a local authority responsible for maintaining land records in their respective regions.

The blockchain would serve as a **distributed ledger (DLT)**, providing a secure and transparent way to manage land records.

# RECOMMENDATIONS

## Decentralization Tech in BHOO MI

Another approach could involve creating a network of regional data centers, where each center is responsible for managing land records for a specific geographic area.

These data centers would be connected through a secure network, allowing for easy data sharing and collaboration.

# RECOMMENDATIONS

## Implementation of NFT Technology

NFTs, or **non-fungible tokens**, are digital assets that represent ownership or proof of **authenticity of a unique item or asset**.

In the case of Bhoomi, it could be used to **represent the ownership** of a particular parcel of land

# RECOMMENDATIONS

## Implementation of NFT Technology

Some ways that the concept of NFTs could be implemented in Bhoomi:

- Unique digital representation
- Easy transfer of ownership
- 3. Transparency and traceability
- 4. Prevention of fraud

**TIME FOR QUERIES**

THANKS

FOR YOUR

PATIENCE