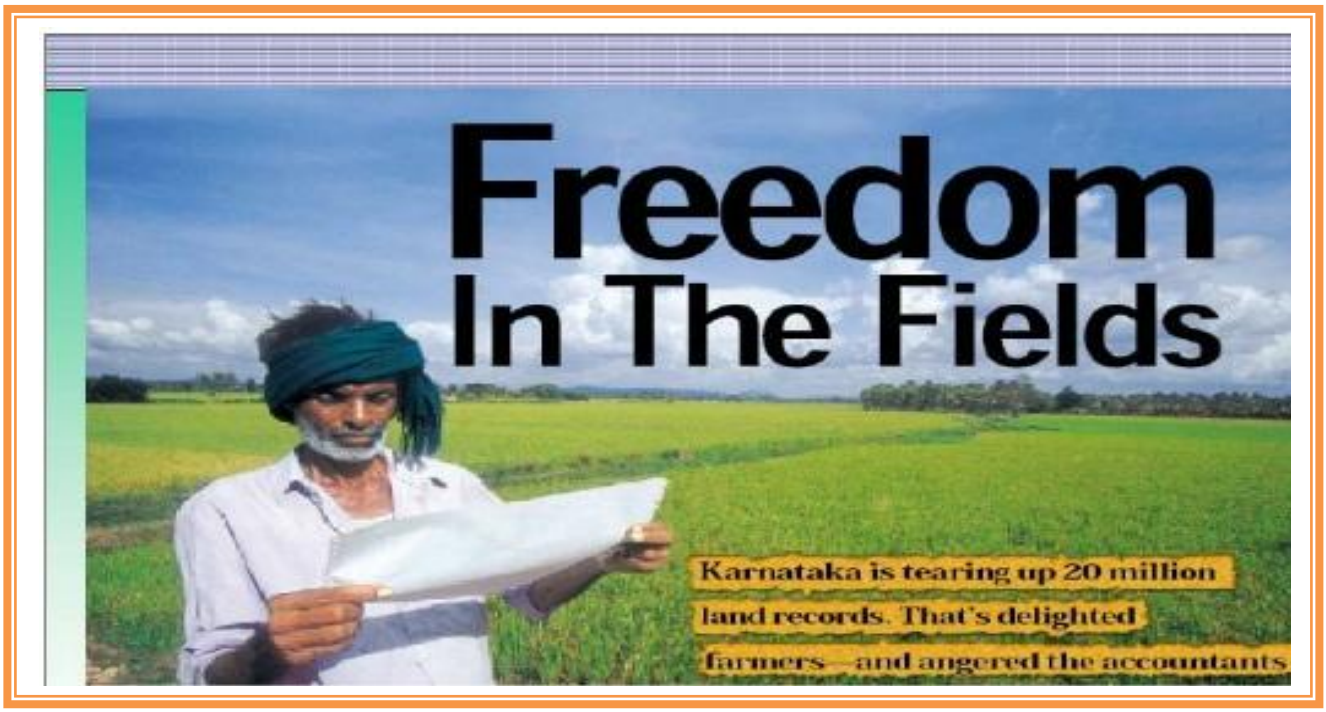
Case Study

Electronic Integration of BHOOMI with Stakeholders, Karnataka



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1. EXECUTIVE SUMMARY

In the Land Records Domain, the 'Record of Rights, Tenancy and Crops' (RTC) is maintained, updated by the Government and is needed by farmers for various purposes such as - for obtaining crop loans, hypothecation of land, getting electricity connection, subsidies, sale of land, creating partition deeds, etc. Land records also form the basis to carry out mutations such as changes in ownership title due to inheritance, sale, acquisition etc.

Provision of RoR documents to citizens in hassle-free manner has always been priority for every Government administration. It is estimated that over 30 million cases are pending in various courts in country only for land related disputes. Transparency in the processes of land administration such as registration, transfer, paying taxes, availing farm credit, getting government lands granted, getting government lands on lease, land acquisition etc., is essential to remove corruption from land administration. This case study will help understand the project domain, execution challenges, resource management and various aspects for citizen service delivery improvements.

Most significant achievement and the transformation of BHOOMI project has come through the electronic integration with stakeholders like Registration Department, land acquiring bodies and banks & financial institutions. These electronic integrations have resulted in reducing / removing human discretion and streamlined the various land records administration activities making Records of Right current with respect to various activities happening in the external environment pertaining to land records.

Is e-Governance and IT a Solution?

Usage of ICTs to build e-Governance systems will go a long way in bringing transparency and thereby reducing corruption and improving quality of land records. The basic characteristics of a well-designed e-Governance system such as audit trail, data integrity, role-based access and data security will bring in much required traceability, accountability and reliability required for any land administration system. Open access to data and the transparent and traceable mutation process has also reduced the number of disputes.

e-Governance system can monitor the activities only after transactions / process data are digitally captured completely. Integration of Bhoomi with Registration Software, Land acquiring Bodies and Banks was a major step in bringing uniqueness to the Land Records System in Karnataka. Independent evaluation studies have shown that Bhoomi has significantly reduced corruption and improved service delivery. The Government of India is making special efforts to replicate Bhoomi in other states of India.

2. INTRODUCTION:

In Karnataka State, the land records were earlier maintained through a manual system, involving 9,000 village accountants, each serving a cluster of 3–4 villages. Nearly 2,500 bank branches in Karnataka loan approximately Rs. 40 billion to farmers as working capital every year. The concept of Computerized Land Records Management Process was first introduced in Karnataka through the BHOOMI initiative in 2001 to bring in overall transparency, effectiveness and ease in the management and maintenance of the Land Records through automation of various processes.

The major objectives to be fulfilled by the Bhoomi project were:

- Facilitating easy maintenance and prompt updating of land records
- Making land records tamper-proof
- Allowing farmers easy access to their records
- Collating the information to construct a data base regarding land revenue, cropping pattern, land use, etc
- Utilising the data for planning and for formulating development programmes.

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:

In 2010, concept of electronic integration of BHOOMI and KAVERI (registration Software) was conceptualized and piloted in five taluks namely, Bangarpet, KGF, Malur, Kolar and Tumkur. Overwhelming success in pilot resulted in rolling out of BHOOMI-KAVERI integration all across Karnataka covering 244 out of 247 Sub Registers Offices spanning over 200 taluks except three taluks due to reasons such as non availability of connectivity, infrastructure etc.

Land acquisition is another important activity which results in updations to RORs at various stages of acquisition process. BHOOMI was electronically integrated with BHOOSWADEENA software in 2011. Project is running successfully in all 52 sub division offices of revenue department and 27 Special Land Acquisition Offices across Karnataka.

Electronic integration of BHOOMI with Banks was started in 2012. Approximately 1400 branches of 29 banks across Karnataka are using the facility to raise request for creating or removing charge and also enhancing the liability on agricultural lands belonging to farmers who are availing farm credit.

3. OVERVIEW OF THE PROJECT OWNER

- ***Details of the owner(s):***

Smt. Latha Krishna Rau, is the 1982 batch IAS officer for Karnataka State Cadre. Post completing her graduation in Psychology and post-graduation in English, Smt. Rau cleared as IAS officer in Karnataka State Cadre. As a part of administration, Smt. Rau has worked across almost all the Government departments and ministries in past 22 years of service. Smt. Latha Rau had joined her first role as Assistant Collector for Land Revenue Department and District Administration from 1884 to 1986.

- ***Details of her current position/managing unit:***

Smt. Rau is currently holding charge as Principal Secretary in the Revenue Department of Government of Karnataka. During her tenure, she has transformed the revenue function for complete state into an integrated solution based on utilization of e-Governance Framework and using her domain expertise in Land Domain

- ***Her experience on the project:***

Smt. Latha Krishna Rau has been a strong pillar of support in the successful implementation of this complex integration project. In her capacity as the project owner, she had to overcome several challenging situations to bring it to the current level of implementation which involved convincing and getting a buy in from various stakeholders, overcoming technological challenges and psychological resistance to successfully implement the project.

The various categories of stakeholders including administration, politicians, local people and internal staff were involved in the project. She had to initially deal with each one of the above stakeholder groups who had their own perspective, interests and resistance to bring in such an integration project. These stakeholders were strong-minded and difficult to convince. Yet, Smt. Latha Rau was able to find a work around taking cognizance of requirements as well as resistance of the stakeholders. Also, the strong commitment, dedication and excellent project management capabilities were required to roll-out the project in time-bound manner across the state. Smt. Rau through her collaborative working, required for such transformational projects, ensured proper project management and regular monitoring of the project.

4. PROJECT OVERVIEW / HISTORY OF THE PROJECT

- ***History of Document Management***:

Previously, farmers were solely dependent on Village Accountant (Village Level functionary of Revenue Department in Karnataka) to get a copy of the Record of Rights, Tenancy and Crops (RTC). RTC is a document needed for many tasks such as obtaining bank loans, selling properties, creating partition deeds etc. There were delays and harassment. The traditional process for the management and maintenance of the land records document was completely manual and paper-based. The process was extremely complex leading to harassment of stakeholders including revenue administration, judiciary, and registration officials and most importantly, to the citizens.

BHOOMI, a land records management system implemented by Government of Karnataka with National Informatics Centre as technical partner is a fine example of how e-Governance systems can bring reforms in the area of land administration. Revenue Department in Karnataka has computerized 200 lakh records of land ownership of 67 lakh farmers in the state. All the Record of Rights (RoR) documents have been verified and certified by the revenue authorities before making digital database as it is the only source of land records. Manual records have been invalidated through amendment to Karnataka Land Revenue Rules 1964.

Any changes to record of rights will happen through online mutation application (BHOOMI) only. Online mutation application handles all types of mutation so that no manual intervention in updating land records database is required. Workflow based user-friendly software has been designed and developed by National Informatics Centre, Bangalore and has bio-metric authentication to take care of non-repudiation and scanning interface to scan important documents as evidence for electronic transaction. PKI (Public Key Infrastructure) enabled BHOOMI database and application with integration of digital signatures is in place to adhere to IT act 2000. On an average BHOOMI software handles more than one lakh mutations a month. About 9,000 Village Accountants, 800 Revenue Inspectors, 203 Sheristedars, 1000 Operators-cum-Village Accountants, 203 Tahsildars and 52 Assistant Commissioners work on the system based on clear-cut roles and privileges given to them.

The updation of the Land Records is the key in the overall process of the Land Records while designing the Bhoomi solution. It has built-in workflow automation, which moves transactions from one officer to another electronically and has been developed in local language (Kannada) to facilitate ease of use. It also takes care of security aspects and thus has provisions for foolproof authentication system instead of traditional password based authentication system where it allows documents such as RTC, mutation extract etc to be digitally signed.

5. SITUATION IN PROJECT OWNER's STATE/ DISTRICT

The Original Bhoomi Project: Pre-Integration stage

Even though BHOOMI had become operational in 2001 in most of the taluks in Karnataka, most of its interfaces with other stakeholders were manual in nature. For example, when a change of ownership or transaction takes place, applicant files request for initiating the mandatory process known as mutation for effecting necessary changes in the ROR. Mutation requests after registration (popularly called as *'J-slips'*) in sub registrar's office were sent in paper form to Tahsildar for carrying out mutation to bring name of the new purchaser in record of rights. This process was still manual and time consuming with multiple human touch points and hassles to farmers.

Also, in pre-BHOOMI days and till 2011 during BHOOMI implementation, for the notifications received from different land acquiring bodies, data entry had to be done by Application Kiosk operator and then BHOOMI back office had to process the mutation. As a result most of the land acquisitions were not getting updated on record of rights and RoRs were not depicting the actual ground reality on the paper. Non updation of such important data results in huge loss to purchaser as owner of such acquired lands would have lost all rights on the lands. Not only this, the Government also is involved in Land Acquisition for various development purposes of canal building, road development, rehabilitation, village/town extension, culverts, reservoirs, military camps, railways, industries, etc. Since, the Land records were already computerised in Bhoomi, Government decided to extend the integration project with the Land Acquiring bodies in the state.

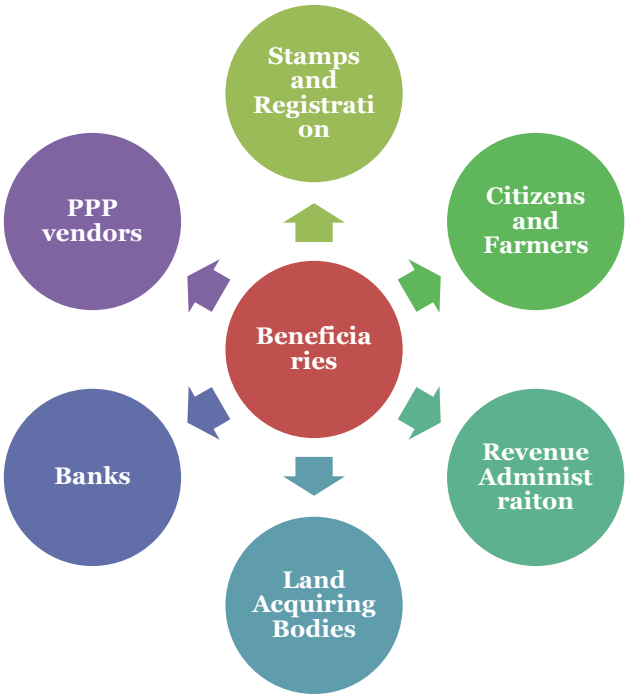
When analyzed, revenue department observed that the different types of transactions happening in BHOOMI, more than fifty percent of transactions were pertaining to pledge and release of lands. These are transactions wherein citizen pledges his land to banks or co-operative institutions for getting farm credit or released the property after paying back the loan.

- ***Stakeholders:***
  The stakeholder segment for Land Records System is a huge base starting from Highest Administrative unit in Government functionary to rural farmers.

- ***Beneficiaries:***

The integration of BHOOMI with Kaveri, Bhooswadeena and Banks was the key step for realization of actual benefits of Land Records Management System.

- Electronic Integration of Bhoomi with Kaveri – Citizens, Department of Stamps and Registration and Revenue Administration
- Electronic Integration of Bhoomi with Bhooswadeena – Citizens, Revenue Administration / Land Acquiring bodies and Agencies who have requested land acquisition



- Electronic Integration of Bhoomi with Banks – Citizen, Banks and Revenue Administration

- ***Steps/ action taken at the state/ district level to address the problem:***

Partnerships were forged with many different agencies. Agencies like the NIC and private data entry agencies played a pivotal role during various phases of implementation. Since the departmental staff was reluctant to enter data, private data entry agencies were used.

Integration as a key Solution

The interfaces of Bhoomi project were to be enhanced to bring in online data exchange from various stakeholder sources like Registration Department, land acquiring bodies, banks and most importantly deliver seamless services to citizens. As a part of complete end to end computerization and interdepartmental integration, 3 major innovative steps were taken by the Government of Karnataka, which includes

a) In 2010 concept of electronic integration of 'BHOOMI' and 'KAVERI' was conceptualized and piloted in five taluks. The integration with registration software was a key to get rid of malpractices in sale deeds. This integration was also going to be helpful for all citizens who had to go to Land records office post registration with physical papers. Because unless transaction is initiated on BHOOMI with these cases received in paper, Bhoomi solution had no means to locate the land deals Hence, Government of Karnataka took

this ambitious and innovative step to integrate the Bhoomi System with Registration Department.

b) In the Land Acquisition cases, it was difficult for solutions to exchange the data between Bhoomi and Land Acquisition software BHOOSWADEENA. Operator had to manually enter the land acquisition cases post the acquisition. Also there were no means to command and identify the land acquisitions at run time. So, Electronic integration of 'BHOOMI' with 'BHOOSWADEENA' (*Land Acquisition software in Karnataka*) commenced in 2011. Project is currently running successfully in all 52 sub division offices of revenue department.

c) Volume of applications that were being received from the banks and co-operative institutions for creating liabilities on the land were huge and hence resulted in time delay. Revenue department therefore decided to integrate BHOOMI and Bank activities electronically. Electronic integration of 'BHOOMI' with 'Banks' was started in 2012 to bring in banks as an active stakeholder in Land processes.

6. MODALITIES OF THE NEW SYSTEM (SOLUTION)

System Design and Modalities of the new integrated solution

Integration of Bhoomi with various existing application software was a challenge in terms of technological interdependencies and process mapping for the data exchange. The integration success was to be achieved with the objective of complete automation during the data exchange process. The applications like Kaveri and Bhooswadeena were already in place and operational for years. In order to bring in the integration aspect, various standard operating procedures were to be defined to ensure smooth data exchange without impacting the services of both the departments under transformation. The system architecture is detailed in exhibit 4 for better understanding of the integration design for the projects.

System I - Electronic integration with Kaveri:

Implemented solution involves the activities performed at three locations namely, Sub register's office, State Data Centre and Taluk BHOOMI back office to achieve the desired objective.

Sub register's office

For every transaction in sub register office with respect to agricultural land, KAVERI application consumes the web services published by BHOOMI in state data centre for entering the transaction details on real time basis. Further, it will submit two sets of data to web services after the transaction is complete. KAVERI software which manages

registration is developed using VB 6.0 and SQL SERVER 2000 as backend database. Windows Services / Schedulers are used to poll the web service hosted at SDC for offline XML data transfer.

State Data Centre (SDC): hosts all the web services, Windows services / Schedulers required providing ownership details to KAVERI from BHOOMI database

Taluk BHOOMI back office: A web service to receive XML with complete details of registration transaction from SDC to taluk server is published at Taluk offices.

System II - Electronic Integration with Land acquiring system

Web pages in the presentation layer for LAO/SLAO activities with web services in the middle tier for business logic and integration with database. Prominent system features include:

- A combination of windows services and web services are being used for transferring requests to respective taluks for processing in BHOOMI and vice-versa. Electronic data exchange in the form of signed XML.
- Digitally signed and bar-coded notification for easy verification by accepting authority
- Automatic initiation of mutation application in BHOOMI on successful verification of XML notification.

System III - Electronic Integration with Banks

- Solution includes a website, a scheduled job and few web methods
- Website – Website is for bank to raise request for the charge creation or release of charge has been hosted in SDC (State Data Centre of GOK) and bank can connect through internet to this web site.
- BHOOMI Monitoring Cell which has super administrator privileges would create administrators for individual banks.
- Application connects to BHOOMI database in SDC to give details of ownership to banks. After bank user creates the transaction using BHOOMI data, software generates the XML of the transaction and prompts for digital signature. Once XML is digitally signed, it will be stored into the database at SDC for further processing.

- ***Technology Platform used:***

  - ***Description:*** Bhoomi software - As explained in an earlier section, while Bhoomi started with local servers placed at 177 taluks with SQL 7.0 and Visual Basic.

Recently, the application has been updated to SQL 2000 with new components of Bhoomi being written on .net 2.0.

Use of XML for data exchange: SDC accept the XML data pertaining to registration. A windows service / Scheduler to call respective taluk web service for transferring detailed XML of the registration transaction as and when received in SDC. All components in SDC are written in dot net 2.0 with SQL SERVER 2005 as backend database and hosted on Windows server 2003.

- ***Interoperability:***

XML web services used for data exchange support interoperable machine-to-machine interactions so that heterogeneous systems can talk to each other and exchange the data.

Data exchange is happen using XML which is open standard and care has been taken while developing integration modules to separate out data, presentation and business logic layers so that same modules of electronic integration can be used even if backend databases / software is upgraded due to technological obsolesce of Visual basic and SQL Server 2000.

- ***Security concerns :***

BHOOMI software is a workflow based system with Bio-metrics and digital signature integration along with built in FIFO concepts.

Since most of the services are hosted in State Data Centre (SDC), security of the solution and data is ensured. The solution provisions a well designed e-Governance system with audit trail, data integrity, role based access and data security to bring in much required traceability, accountability and reliability required for any land administration system. The solution provisions digitally signed and bar coded RORs without ink signature which are highly secured and tamper-proof.

- ***Any issue with the technology used:***

The upgradation of the technological platforms would be a challenge as the same has been implemented across Registration departments, Land Records Department, Land Acquisition bodies and various banks. The integration in the current process is through XML data exchange for taking to various databases. However, going further, in order to bring in runtime single platform for services, the solution would be required to move to a single platform and single data base.

- ***Service level Agreements (SLAs):***
  - Service levels for the application and request processing for every transaction and integration process are minutely defined and rigorously monitored to improve further.
  - BHOOMI Monitoring cell has been established for maintaining service levels of performance
  - The performance of service levels and application downtime have been defined critically and tracked for complete solution to ensure 365*24*7 services to citizens.

➢ ***Measures to ensure replicability:***

The project recognises that the replication need not necessarily involve the use of the same software as was implemented in the successful application. It is more important to capture the processes that lead to successful implementation such as digitisation of manual data, re-engineering of processes, involvement of all stakeholders and management of change. Continuous improvement and documentation of the procedures and legal provisions would support the process.

➢ ***Restrictions, if any, in replication and or scalability:***

There are no restrictions to the scalability or in replication. Data exchange between stakeholders is in the form of XML documents. XML documents from outside the department are digitally signed by concerned authority and veracity of the XML is checked before using the same in the target systems. XML web services used for data exchange support interoperable machine-to-machine interactions so that heterogeneous systems can talk to each other and exchange the data. Since most of the services are hosted in State Data Centre (SDC), scalability is not an issue. Fact that each of these integrations have been rolled out all across Karnataka within a span of less than one year and solution is working fine since then is a good exhibit for scalability of the model. Keeping future enhancements to registration in view, finger prints and photos of purchasers are being stored in BHOOMI database.

➢ ***Risk Analysis:***

- Maintaining the data security and confidentiality is critical in such integration project where there exist multiple system users and multiple access channels.
- Connectivity of these services was essential to ensure constant service delivery and solution availability. Heavy reliance on online system requires robustness in reliability.
- Stakeholder participation was important to ensure that roles and responsibilities post re-engineering of processes were complied with

- Strong project management and sustainable efforts are required to keep project rolling even post this implementation stage.

➢ ***Capacity Building model used:***

Training provided to all stakeholders at District and State levels, separately for integration with each application.

Series of training programs were held to train the BHOOMI operators, BHOOMI Consultants, Sub Registrars and District Registrars for BHOOMI-KAVERI integration, similarly all Land Acquisition Officers and their staff were trained for BHOOMI-BHOOSWADEENA integration. In case of BHOOMI – BANK integration, series of training programs were held to train officers from different banks, close to 400 master trainers have been trained by BHOOMI Monitoring Cell.

7. IMPACT ON THE STAKEHOLDERS/BENEFICIARIES

Over the years BHOOMI has evolved into a system which has almost removed human discretion in land records management process except in areas where officials have quasi-judicial power. Web presence of BHOOMI has helped citizens to have easy access to their records. Electronic integrations have resulted in simplifying the whole process for transaction whether it is registration in KAVERI, generating of notification in BHOOSWADEENA or raising request for charge creation by Banks.

➢ ***Cost benefit analysis:***

As far as BHOOMI-BANK integration is concerned, citizen saves a lot of money, time and energy as he can complete the process of availing farm credit in just two visits to bank as compared to multiple visits he was making to bank or taluk office and other banks to get NOC.

Approximately 10 lakh RoRs are issued from BHOOMI every month. Till 2010 Rs. 15 was charged per ROR, from 2011 it has been reduced to Rs.10. While government was to get Rs 15 for RORs issued from government run centres, amount that department use to get from rural telecentres for issuing RoRs which were under PPP model was Rs. 10 from 2006 to 2010 and Rs. 5 from 2011 onwards. (*Refer Exhibit 5 for details*)

➢ ***Value Delivered to Stakeholders:***

To Registration Department

- Integration of BHOOMI and KAVERI (Registration software) has helped in availability of data at the time of registration with respect to agricultural land

- Integration of KAVERI with BHOOMI system ensures that the seller is indeed owner of the property as per the BHOOMI database.
- Soon after the transaction is over the extent in BHOOMI database of the seller gets decreased ensuring that he cannot sell more than what he owns or that he cannot sell the same piece of land to others.
- It was very much possible that after registration of transaction, the mutation was never initiated in BHOOMI system as the manual flow of information from registration to BHOOMI in some cases just did not find favors with mutation officers and transaction work was pending for an indefinite period till rent was paid. This bottleneck has been removed.

To Revenue Department

- Reduction in process cycle time and increased efficiency across revenue officers for Land Domain during conducting business in the respective offices and also in mutation process.
- Time taken for initiating mutations came down from 31 days to just 2 days in 2010-2011.
- Reduces the redundant data entry of mutation transactions
- Avoids about 4-5 stages in the workflow and removes data entry mistakes resulting in rejection of mutations
- Liabilities are created in systematic manner so that MIS and analysis reports can be generated
- RoRs are up to date with respect to liabilities on land parcels

To Banks

- Get SMS alerts on transactions initiated on the land parcels for which they have disbursed loan
- Banks will be considered as interested party and notice will be served at the time of ownership transfer
- Certainty in ensuring recording of liabilities on land parcels
- Can access data from Bhoomi database so that authenticity of documents is un questionable
- Bank can be sure on ownership of land parcels as it is coming from authentic source

To Citizens, majorly Farmers:

- A well designed land records management system increased the confidence of the farmers. Farmers also report various successions which take place in their family.
- Due to integration with kaveri, purchasers who are investing money on the transaction is protected as sellers are not allowed to execute multiple

transactions, no transactions are allowed on government land / land with government restrictions. Purchasers' interest is protected as warning messages are prompted before transaction if court stay / order exists on the land parcel involved in the transaction.

- Mutation in BHOOMI is done in such a way that all of the mutation requests are accounted for and they necessarily happen in FIFO.
- SMS integration to the process updates the citizen about the status of his transaction.
- Access to notifications has been made easy by making them available on web.
- Timely updation of land records is helping the prospective buyers to take decisions as ground reality is reflected on records of rights with respect to acquisition proceedings that are in progress on a particular land parcel.
- Integration with banks has resulted in maximum benefit to farmers in terms accessibility and user convenience.

Land acquiring bodies:

- Facilitates LAO/Deputy Commissioner in generating preliminary notification using BHOOMI data which is digitally signed.
- Facilitates LAO office to generate notices to public after preliminary notification.
- Facilitates LAO office to receive objections and prepare 5A report automatically.
- The notification of intended acquisition of land indicated on the record of right resulting in savings from multiple payments.
- Facilitates LAO to submit court stay or vacation of stay on notification or de-notification thereby effecting the similar changes in BHOOMI database to avoid in-convenience caused to the public.
- Facilitates dissemination of these notifications through WEB for information sake and digitally signed and bar coded notification to citizen through rural / urban telecentres.
- Facilitates in generating exception reports with respect to changes happened in BHOOMI database due to time lag between initiation of land acquisition proceedings and notification, which helps in avoiding wrong notifications.

Other departments: Different departments such as Department of Survey, Economics and Statistics, Agriculture, Horticulture, Forest, Agricultural related boards and corporations use BHOOMI data extensively. Crop details of RORs are used by department of Economics and Statistics, Agriculture and horticulture. Forest department uses RORs data for protecting forest land.

8. Challenges During the implementation of BHOOMI

a. *Interoperability Challenge:* As all the applications were in place (Bhoomi, Kaveri and Bhooswadeena), the integration requirements for the project was a challenge considering various pre-defined workflows, processes and technology platforms.
b. *Minimizing the inter-dependence:* Considering the security of data and decisions requirements for executing a particular action, minimizing the human interventions from all departments was reduced to zero. No triggering required in the intermediate processes.
c. *Herculean Computerization Task:* Making computerization of land records as primary activity was herculean task as this was seen as secondary activity compared to election, census, disaster etc. Project Champion struggled a lot to make it a primary activity by making every one right from top bureaucracy and political leadership understand that proper maintenance and updation of land records are important for an effective system.
d. *Technical Capacity Building:* Technical support and capacity building was required at all the stages of the project starting from LAO offices, Bank level data entry staff, creation of mutation NOC, integration requirements at registration staff, etc.
e. *Ensuring Service Continuity and ICT provisioning till village level:* Maintaining Hardware, UPS and providing consumable such as secured stationery, holograms, printer cartridges etc., at taluk level was another important challenge. Revenue department had to come out with a concept called facility management under PPP.

9. FUTURE ROADMAP / SUSTAINABILITY

BHOOMI is a good example of a project which has all characteristics of a well-designed e-Governance system.

Technological Sustainability: BHOOMI developed on Visual Basic 6.0 and SQL SERVER 2000 and all the modules required for electronic integration have been developed using dot net technologies. With a dedicated team and state of art technology , Bhoomi has demonstrated a sustainability and will continue to do so. By the end of December 2006, the total user fee collected through issuance of RTCs was Rs.45 crore. This amount not only covered the investments made in computerisation but left enough surpluses for further development.

Legal Sustainability: Data exchange between the different stake holders happen using digitally signed XML, except BHOOMI-KAVERI. BHOOMI-KAVERI has been implemented as for the provisions of the laws like prohibition of transactions on land parcels with government restrictions, government lands, land proposed in transaction should be free from encumbrances, mandatory requirement of pre-mutation sketch where survey number is getting divided etc.

10. ANNEXURE(S):

EXHIBIT – 1 – Abbreviations

Sr.	Abbreviation	Explanation
1.	RTC	Record of Rights, Tenancy and Crops
2.	RoR	Record of Rights
3.	GDP	Gross Domestic Product
4.	PKI	Public Key Infrastructure
5.	FIFO	First In – First Out
6.	FIT	Fingerprint Identification Technology
7.	SRO	Sub Registrar Office
8.	NIC	National Informatics Centre
9.	LAO	Land Acquisition Officer
10.	XML	Extended Markup Language
11.	SDC	State Data Centre
12.	GOK	Government of Karnataka
13.	NOC	No Objection Certificate
14.	SQL	Structured Query Language
15.	SLA	Service Level Agreement
16.	ICT	Information and Communication Technology
17.	PPP	Public Private Partnership

EXHIBIT – 2 – Benefits of Integration Project – Comparative Analysis for pre-integration and post integration requirements of the projects.

a. Integration of Bhoomi with Kaveri

Measure	Initial BHOOMI	BHOOMI with XML exchange with KAVERI	BHOOMI – KAVERI Online Integration
Request for mutation	Citizen has to approach Taluk office	Automatic	Automatic
Data entry of Application	Required to be done by taluk office operator	Semi automatic	Fully Automated (No Data Entry)

Measure	Initial BHOOMI	BHOOMI with XML exchange with KAVERI	BHOOMI – KAVERI Online Integration
Generation of transaction & notice	Yes (User has to generate using option provided in the software)	Yes (User has to generate using option provided in the software)	Fully Automated
Validations	Only at Data Entry level of Mutation entry	Only at Data Entry level of Mutation	At the time of Registration
Disputes	Less	Lesser	Least
Human discretion	Less	Lesser	Least

b. Integration of Bhoomi with Bhooswadeena

Measure	Initial BHOOMI	BHOOMI – BHOOSWADEENA Online Integration
Request for mutation	Acquiring bodies has to approach Taluk office	Automatic
Data entry of Application	Required to be done by taluk office operator	Fully Automated (No Data Entry)
Generation of transaction & checklist	Yes (User has to generate using option provided in the software)	Fully Automated
Validations	Only at Data Entry level of Mutation entry	At the time of generating land acquisition notification
Disputes	Less	Least
Human discretion	Less	Least

EXHIBIT – 3- Services offered in BHOOMI

a. <u>Through taluk kiosk</u>

- *RORs (Current and old)* – Both Current and old RORs are available at the cost of Rs. 10 each. In case of PKI (Public Key Infrastructure) enabled taluks, digitally signed and bar coded RORs without ink signature are being issued.
- *Mutation extract* – This is the document that gives the details about acquisition of right, certified copy of this document is available at the cost of Rs. 15.
- *RR5 and RR6* – Records of rights form – 5 and form - 6 which is commonly called as RR5 and RR6. These documents give history of transactions chronologically for a particular village and on a particular survey number for a given period respectively.

- *Khatha Extract* – All the land parcels owned by a person in a village will be listed in the Khatha extract.
- Mutation status – A document which talks about stage at which the requested transaction is currently held up and from how many days.
- Scanned copies of served notice, mutation extract, Tippan – Scanned documents such as served notice having signatures of the interested parties, mutation order with signatures of Village Accountant and Revenue Inspector and scanned image of tippan (sketch of land parcel) are available for dissemination from taluk kiosk.

b. <u>Through rural tele centre</u>

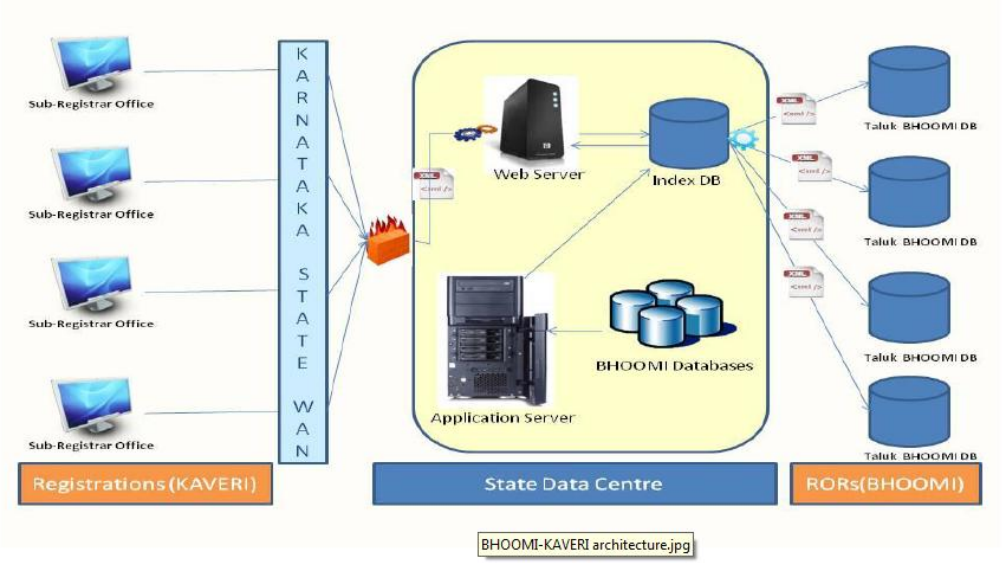
- RORs (Current and old)
- Mutation extract
- Mutation status

c. <u>Through web (for view only)</u>

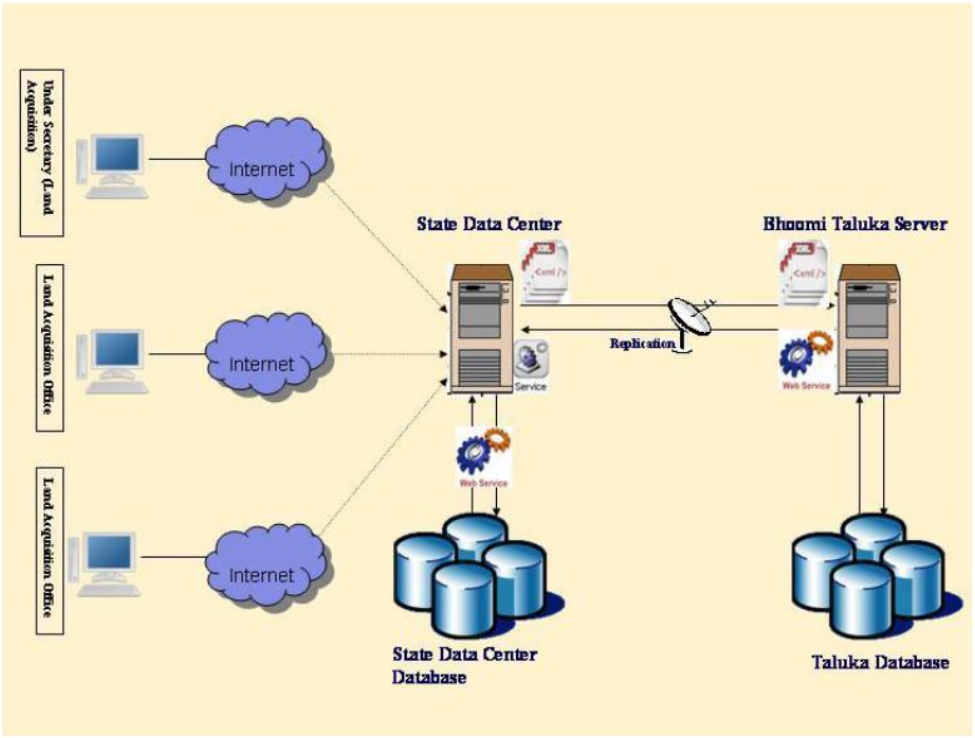
- RORs (Current and old)
- Mutation extract
- Mutation status
- Scanned copies of served notice, mutation extract, Tippan

EXHIBIT – 4 – Flowchart of activities under the new system

a. Architecture – Integration of Bhoomi and Kaveri



b. Integration of Bhoomi with Bhooswadeena



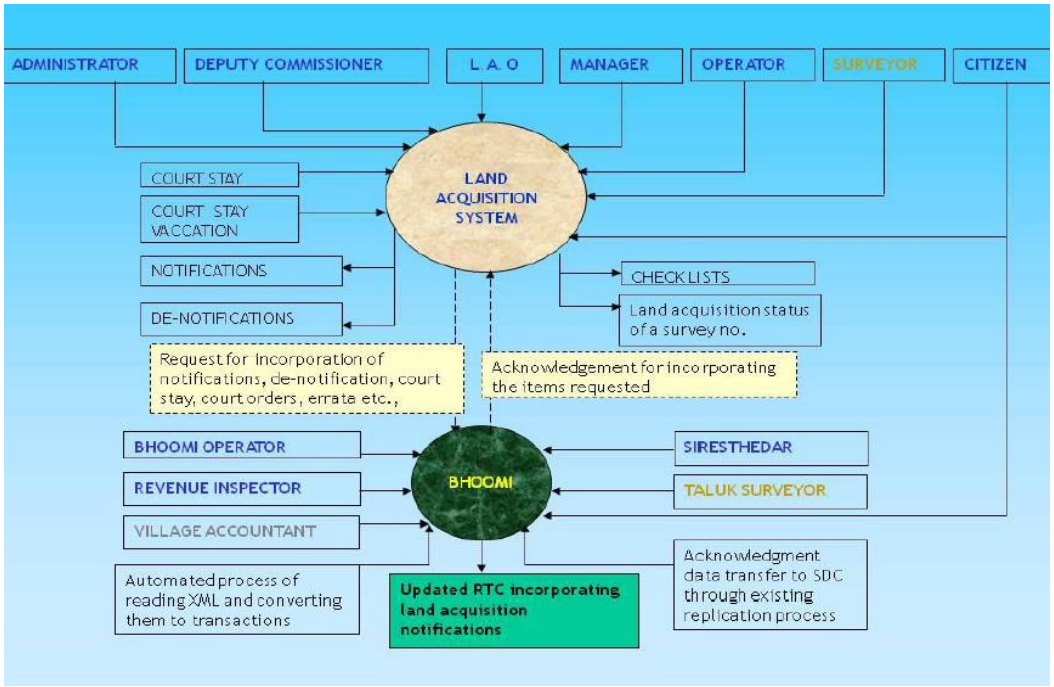


EXHIBIT –5 – Project Statistics- Number of RoRs issued and user charges collected

Year	Number of RoRs issued in Rs. (lakhs)	User charges collected in Rs. (Lakhs)
2003	56.4	765.0
2004	63.4	885.1
2005	80.2	1154.7
2006	97.4	1406.7
2007	90.8	1314.1
2008	86.8	1261.6
2009	98.5	1423.5
2010	89.9	1289.3
2011	116.3	1168.7
2012	124.8	1256.8
2013	119.3	1209.8