Bhoomi: an eConveyancing (Indian) Solution for Secure Land Tenure

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Key words: Bhoomi, eConveyancing, RTC, Mutation, Tenure Security

SUMMARY

The Bhoomi built, operated and owned by the Revenue Department of Government of Karnataka, is an e-Conveyancing system, within a secure extranet, enabling anyone to obtain information on any agricultural land of Karnataka, India through the public kiosks established in all the taluks and other kiosks established in the villages through Public Private Partnership. The Bhoomi system with 20 million RTCs of 6.7 million farmers in 176 taluks within Karnataka state is one of the largest databases of property information in the world. This system works with the software designed fully in-house by the National Informatics Centre, a Department of Government of India. The project was largely funded by Government of India and some critical components of this project were funded by the Government of Karnataka. The services offered through these kiosks are: obtaining copy of Records of Rights, Tenancy and Crops (RTC), Extract of Mutation Register (MR) and carrying out Mutation of Land Records.

This report discusses about the various aspects of Bhoomi, such as the work flow in Bhoomi, legality of mutation done in Bhoomi, strategies employed for its implementation, innovations in Bhoomi, lessons learned from Bhoomi and the way forward.

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1. INTRODUCTION

The Bhoomi built, operated and owned by the Revenue Department of Government of Karnataka, is an e-Conveyancing system, within a secure extranet, enabling public to obtain information on any agricultural land of Karnataka in India, through its kiosks. The Bhoomi system with 20 million RTCs of 6.7 million farmers in 176 taluks (sub-districts) within Karnataka state is one of the largest databases of property information in the world. This system works with the software designed fully in-house by the National Informatics Centre, a Department of Government of India. The project was largely funded by Government of India and some critical components of this project were funded by the Government of Karnataka.

The services offered through these kiosks and the user charges are as follows:

- Obtaining copy of Records of Rights, Tenancy and Crops (**RTC**) of any property from the Bhoomi kiosks for a user charges of US $0.35,
- Obtaining extract of Mutation Register (**MR**) of any property from the Bhoomi kiosks user charges of US $0.35,
- Carrying out Mutation of Land Records for a user charge of US $0.80. This facility is available in taluk office kiosks only,
- Obtaining Mutation Pendency Status report, indicating the delay in processing of mutation applications of farmers. There is no user charge for this service.

The user interface of Bhoomi is in the vernacular language (Kannada) and also there are operators in the Kiosks who extend all help to the farmers for obtaining the required information from Bhoomi. All what a farmer need to provide are the survey number of the property on which he seeks information and the required user charge.

2. BHOOMI: THE STORY SO FAR

2.1 Workflow of Mutation in Bhoomi

The Mutation process starts when the Village Accountant in the Bhoomi Kiosks established in the taluk offices receive the application forms, either personally or by post, for mutation (whether inheritance or sale deed or partition etc), who in turn accepts the application if all the mandatory documents has been provided along with the applications or else advises applicant to resubmit the applications with all required documents. The mutation data would then be identified and validated against the existing register to confirm:

- o that mandatory data required for mutation have been supplied, and
- o the validation of that data against information held on the register of RTC.

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If the validation test fails the applicant would be advised accordingly by the Village Accountant to correct the mistakes through appropriate proceedings. The mutation process would also get initiated whenever J-slip from registrar, intimation of loan from banks, intimation about a land grant, conversion, court decree, land acquisition etc competent authority are received in the kiosks.

On passing the validation test, the Bhoomi system would allocate a unique identifier and generates an acknowledgement which would be printed and signed by the Village Accountant (kiosk) and handed over to the applicant. All the reference to the progress of the mutation process would hereafter be done basing on this identifier. Most importantly, the Bhoomi system will not permit the Revenue Inspector to by pass the order in which applications have been received while passing his orders for mutations. This has been specially built into the system to ensure the farmers are not put into any sort hardship by delaying any application.

The files would then move to the account of the Shirastedar for approval of the entries of all the information of that application made by the Village Accountant on the Bhoomi system. The Shirastedar would compare the entries with the paper documents and approve the entries on the system, after carryout corrections, if any. But the Shirastedar can not keep the mutations pending for his approval of the entry. The Bhoomi provides for a report to show whether Shirastedar is approving entries every day or once in a while (Revenue Department, 2002a). On his approval a substantive register entry would be made in the system to note the application; the Register would automatically be frozen, for a notice period 30 days and the files moves back to the Village Accountant.

In case of those mutations, where 30 days notice need to be given to the interested persons for objections, the system would also generates notices on Shirastedar's approval, The Village Accountant (kiosk) would then print those notices and club with the rest of the papers. In those cases, where these notices are not required to be served, the Village Accountant (kiosk) waits for the Revenue Inspectors to pass the mutation order on paper after following normal procedure basing on the documents submitted, for entering his orders into the system. In both these cases, the Village Accountant (Kiosk) shall give all the papers along with notices (wherever generated) to the Village Accountant of the concerned village and obtain his acknowledgement in the register kept in the kiosk. In cases involving service of notice to interested parties, the files moves to the account of the Shirastedar, after the printing of notice by the Village Accountant (kiosk), for entry of objections, if received and remains there in his account till the completion of notice period.

In the mean time, on receipt of notice and other papers, the Village Accountant of the concerned village would follow the mutation process by serving the notices to the interested persons and conducting field enquiry wait till the notice period is over. On completion of the notice period, if no objection has been received by the Shirastedar in the mean time, the Revenue Inspector would pass the Mutation order which would be recorded in the mutation register. At the same time in the Bhoomi system, on expiry of 30 days, if no objection has been filed, the mutation files automatically moves to the account of the Village Accountant (kiosk) again for the entering the details of mutation order passed by Revenue Inspector and scanning and storing the mutation order passed by the Revenue Inspector and the notice

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served by the village account, which contains the acknowledgement and noting made by all the interested parties, into the Bhoomi system (Revenue Department, 2001a).

The files then moves to the Account of Shirastedar for checking and approving the entries of the mutation order of Revenue Inspector. On his approval the mutation takes place, the RTC would be unfrozen, old RTC would be archived; the new entries would be converted to the new edition of the RTC. A message to confirm completion of mutation would be triggered and copy of the new edition of the RTC would be printed. The Village Accountant of the concerned village then collect the printout of the new RTC, remove the old printout of this RTC from his Register and insert this new printout at the same place (Revenue Department, 2001a).

Once all the transactions are over, the Village Accountant (kiosk) shall send the papers to Bhoomi case worker. It is only now that the paper should be sent to the Assistant Director Land Records (ADLR) for survey action by Bhoomi caseworker, wherever required.

2.2 Legality of Mutation in Bhoomi

The mutation is required carried out as per the provisions of section 129 of Karnataka Land Revenue Act read with Rule 63, 64, 65 and 66 of Karnataka Land Revenue Rules in Karnataka and all the legal documents as stipulated in the above provisions, such as notice to the interested parties, acknowledgement there of, field enquiry report, mutations order issued by Revenue Inspector by recording of the same in the mutation register are still prepared in paper, though generated from the database automatically and signed in the case of mutation through Bhoomi also. Though all these information are fed and maintained in database, and scanned and stored in Bhoomi for easy updation and retrieval, all the original document which forms the legal evidences are still safely preserved even after introduction of Bhoomi. Similarly, none of the procedure as stipulated in the Acts and Rules such as notice period of 30 days, display of notice, field enquiry has not been dispensed with. So, as none of the manual processes have been dispensed with, the mutation done in Bhoomi is fully in agreement with law (Revenue Department, 2001a).

2.3 Step by Step Approach in Implementation

The accurate delineation of 20 million properties and conversion of all those information into geodatabase, by itself is a massive job, which would have cost both money and time. Further, due to the highly temporal nature of such information, in the absence of an automated mechanism to update such information, the whole information, which was collected so painstakingly, would have become outdated and useless for any practical purposes within a very short period. So, it was rightly decided at the beginning of the Bhoomi, to adopt a step by step approach in tenure improvements and to concentrate in the beginning only on:

- the creation of a database of attribute information such as RTC and Mutation Register by keeping the survey number of each property as primary key, and
- effective phased introduction of changes in organisational culture and organisational capability, and the successful re-engineering of all relevant business structures and

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processes and operations within the Revenue Department in order to ensure that the database so created get updated automatically as part of the regular business process.

This has paid rich reward and this phase of the project is operational throughout Karnataka and the entire Revenue Department got transformed to do eConveyancing. However, this has, to a great extent, been benefited by the fact that, in villages where agricultural properties are concentrated and Bhoomi is implemented, the land records have been kept fairly systematic and are uptodate, and most of the villagers have a mental picture of distribution of land and ownership and the absence of map is really do not matter much for them in locating different properties. The details of the implementation strategy of Bhoomi has been discussed in Annexure-1 (Revenue Department, 2005).

3. INNOVATIONS

- The biggest innovation has been the decision to go ahead with automation of the attribute information of the land records, instead of waiting for the availability of the spatial information, on which many years have already been wasted, debating various trivial issues such as accuracy, method of survey, when the time is running out and the opportunity cost is mounting,
- Successful transformation of the existing organisational culture, organisational capability, business structure and operations of Revenue Department through the phased introduction of elements involved, to facilitate the implementation of Bhoomi, in a planned and controlled manner,
- Banning the use of handwritten RTCs, in order to ensure that the tenure information gets updated automatically, as part of the business process, once the Bhoomi is made operational in any taluk. However, the manual RTCs of years earlier to year of computerisation will still be valid (Revenue Department, 2001a),
- Overcoming the ban on the fresh recruitment in Government Organizations, by making use of the Government policy of recruiting the dependents of the employees who died in harness effectively to recruit sufficient number of qualified youngsters in each taluk to make each taluk capable of running the system independently by giving extensive training subsequently.(Revenue Department, 2001a),
- Authorizing the Village Accountant (Kiosk), sitting in the kiosk to sign on the RTC copies as and when that is printed, instead of waiting for official like RR Shirastedars or Thahsildars, who are not available in the kiosks all the time, in order to ensure that the very purpose of setting up of kiosk does not get defeated, by insisting on the Shirastedar signing on the RTCs copies generated on the request of the farmers and delaying the issue of the copies by waiting for such signature (Revenue Department, 2002a),

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- Doing away with any sort of application to be filed by the farmers for getting the RTC copies and even to discourage the farmers from bringing any sort of applications, in order to ensure that farmers are not harassed or put into any sort of difficulties in the kiosks.. Presently they are not asked to prove their identity and the reason for seeking the land record. All what is required is to go to the kiosk and tell survey number or name along with village. The Village Accountant (Kiosk) would help them in getting the information sought. A notice board giving all these vital information have been prominently displayed in all kiosks and taluk offices for the benefit of farmers (Revenue Department, 2002a),

- Amending the Section 128 of the Karnataka Land Revenue Act, 1964, to permit the applicant of mutation to get the field sketches of properties prepared by the licensed surveyors and submit those sketches along with the application for mutation, to avoid the delay in surveying the property by the Survey Settlement Department and also to reduce the long list of pending cases,

- The merger of functionally independent Revenue Department and Department of Survey Settlement and Land Records into one Organization in this year, for further smoothening the mutation process.

- Provision of one node of Bhoomi, in the office of the Sub-Registrar of Department of Stamps and Registration, in order to ensure that he is provided with required information, at the time of registering the deed, for conducting required verification to satisfy himself,

- Improving the coordination between the office of the Sub-Registrar and taluk office so much that the intimation about the deed registration (J-slip) reaches the kiosks on the very next day,

- Amendment of the Land Revenue Act to facilitate Public Private Partnership in establishing and maintaining Kiosks in villages and even permitting the operators of the kiosks to sign on the RTC and Mutations copies obtained from the Bhoomi databases,

- Amendment of the Act to legalise the storage and transfer of land information in digital form.

- Introduction of a field called OWNER_SEX in the database in order to the generate statistics about the number of female owners of the land, keeping in view of the government policy of encouraging land holdings by women (Revenue Department, 2000).

4. LESSONS LEARNED

- The tenure security of farmers can be improved substantially by deploying a practical scheme which enable farmers to exercise their rights to land and property by making information on land more accessible by setting up and managing a system of land records which is open to the public,

- The citizen of India are prepared to pay for the services offered by government as long as the services are of reasonable standards,

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- Merely increasing the number of employees in government organization would not result in commensurate improvement in services offered to the citizen, for in spite of having 9000 village officials to take care of the land records in Karnataka, the same was in shamble in Karnataka,

- By bringing in transparency and accountability in government organizations combined with conscious effort to motivate, train and empower the employees can create wonders, for though almost all the manual processes involved in mutation of properties were retained while introducing additional process to be carried out in Bhoomi system, the improvement in services was revolutionary,

- The incremental approach in implementing Bhoomi has allowed government to build technical and administrative procedures, thus ensuring the institutionalization of the new approaches maintaining land records,

5. WAY FORWARD

5.1 Extending the Scope of Bhoomi

The logical extension of Bhoomi is to make use of the expertise gained through the implementation of Bhoomi to expand its scope to the urban lands of Karnataka. Though efforts are already being made towards this end, the problem in hand is much more complex than what has been solved, where the Property Cards (Record of Rights) and the cadastral maps are almost totally outdated and the only information available is the registered deed. But, relating those deeds to the correct property on the ground is almost an impossible task in case of many properties. A possible solution to this could be to link this development with that of Nirmala Nagara, a parallel development initiated by the Directorate of Municipal Administration of Karnataka for collecting the property tax from all the urban properties, in which the information about the owner/tenant of each property is being collected by physically visiting each and every property.

Extend the scope of Bhoomi further, by bringing in all the players like real estate agents, conveyancers, financiers, the Department of Stamps and Registration, Department of Survey Settlement and Land Records, Department of Town Planning and Directorate of Municipal Administration into the existing Bhoomi system and develop Bhoomi as full fledged, paperless eConveyancing solution.

5.2 Adding more Value to Bhoomi

Introduce eCommerce module on the existing Bhoomi system to achieve instantaneous and automated money transfer and permit office of the Registrar and financial institutions to have access to Bhoomi database, on payment of user charges, through eCommerce module, for verifying the details of ownership and liabilities while registering deeds and issuing loans respectively. The eCommerce module has already been developed as part of Nirmala Nagara Project and is available free of cost, which could be exploited.

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Cadastral survey in Karnataka has been done on sound surveying principles, though done using chains and tapes. The accuracy of dimensions and relative positions of property boundaries depicted on the field sketches prepared as part of such survey can meet all the cadastral requirements, though there may be shift in the absolute positions of properties,. Digitizing the boundaries and other reference lines shown in these sketches of 20 millions properties would takes years, so make use of these sketches, by scanning and linking the same with the attribute database of Bhoomi with the link field of Survey Number. As the digitization of property boundary is not involved the work could be completed fast. it would facilitate viewing each and every property along with its accurate dimensions. It would also ensure that the private surveyors who are authorised to survey and prepare the sketches, to be included along with the application for mutation, would get the existing sketches of the property so that the sketches prepared by him would be in agreement with existing one.

Prepare a cadastral map of entire Karnataka, without going for an accurate delineation of property boundaries on the ground, by digitizing the existing village and sub-division maps available with the Director, Survey Settlement and Land Records, after georeferencing the same with the topographical maps of Survey of India (georeferenced village maps of Karnataka are already available with Survey of India) and then linking the properties to the records of the existing Bhoomi system using the link field of survey number for permitting visualization of the properties basing on spatial queries. This would also help to verify whether all the agricultural properties have been included into the system through visual inspection. This would also facilitate the visualization of the rich crop information available in Bhoomi database along with many other applications.

Establish dense net work of ground control points (GCP) using GPS Instruments through out Karnataka. Train the licensed surveyors in using modern surveying equipments like GPS and Total Station. Insist on using these GCPs and instruments as and when field sketches are prepared by these licensed surveyors for applying for mutation. This would ensure that over the years all the properties would get surveyed accurately as part of the normal business process of mutation. Moreover, this information could be used time to time for improving the georeferencing accuracy of existing spatial database used in Bhoomi through rubber sheeting. The government departments also could take up accurate survey of selected properties using same GCPs and instruments on properties which are left out.

5.3 Institutional Issues

All the statutory rules are in place, at the appropriate time permitting the lawful operation of an electronic conveyancing system, and to ensure that the system, as developed, is legally fit for the purpose. Hence, utilise the opportunity of bringing in massive changes like introduction of e-Conveyancing for the cleaning up of the overall system for the common benefit of the society and launch sweeping review of:

- All the 30 (approx.) regulatory frameworks associated with land administration,
- The respective roles and (overlapping) functions of the 17 institutions involved.

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5.4 Interoperability

- Ensure that duplication of efforts in collecting geoinformation by various organizations involved in Land Administration is avoided by improving coordination between all these organizations,

- Ensure that the standards, specifications and data sharing agreements, datamodel schemas, the infrastructure to share etc. are in place to ensure the interoperability of information and services developed by all these organizations,

- Provide all these services through internet, especially in the case urban areas, where the awareness, availability and utilization is in rapidly increasing,

- Make optimum use of XML (eXtensible Markup Language) and XML schemas to enable the extraction of relevant information from the electronic documents as it is electronically transmitted. The agreed XML schemas should be openly available for any interested parties and should be formally published.

5.5 Security Issues

Presently in India, the infrastructure and the legislation required for electronic transfer of documents and its authentication using solutions based on Public Key Cryptography, such as Digital Signature, Certificate-based Authentication, Trusted Third Party (TTP), Public Key Infrastructure (PKI), Cryptographic Hash Function, Encryption, CryptoServer, etc. are available and are being practised in the financial and stock markets (Ministry of C&IT, 2000). These solutions and other access right control measures can protect the integrity, authenticity, non-repudiation and privacy of the data and processes which jointly form e-Conveyancing service. Web based eConveyancing services could be offered in the urban areas by taking advantage of these technological advancements.

5.6 General Issues

- Manage all these transition from the existing organisational culture, organisational capability, business structure and operations to the desired new e-Conveyancing future in a planned and controlled manner, through the phased introduction of elements involved,

- Ensure that all such changes are not introduced as a one-off big-bang affair and are introduced in a modular and incremental basis,

- Ensure that such phased introduction of services and facilities are carefully planned and coordinated through consultation with all the stake holders.

6. CONCLUSIONS

The biggest achievement of Bhoomi has been its ability to harness technology, simplify a complex problem by eliminating all contentious issues and conceptualizing, designing, developing, operationalising and maintaining a self reliant solution which ensure tenure security for 7 million farmers.

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BIOGRAPHICAL NOTES

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Implementation Strategy

The IT capability available within the Revenue Department was not sufficient to manage the implementation of Bhoomi in in-house, the 9000 village officials who manage the land records were of very high age group with low educational qualification (average of Std 10th), the district administration was overloaded with many other important work like tackling of drought situation, problems of drinking water scarcity, visits of VVIP to their areas, elections to various local bodies etc. and the land records were not in a position to t be fed to the computer directly due to various reasons, requiring rewriting of records and application of mind while feeding the data. All these added together made the implementation of the project a challenging job and the following strategies were employed in the implementation:
:

- Private data entry agencies were employed at district level, very often after imparting training to the young employees of those agencies about the basics of database and on feeding the complex land records,

- All the officials of the Revenue Department including 9000 village officials were trained on the implementation of Bhoomi through a series of training programmes,

- In order to strengthen the technical support available at the district level, one private consultant each for every district were employed in addition to the officers of National Informatics Centre (NIC) available at each district,

- In order to ensure that the employees of the Revenue Department get involved in the implementation of the project, own the system when implemented and ensures the correctness database being generated, detailed guidelines were issued to officials of all levels fixing responsibility of checking and verifying different percentages of data being digitized in their jurisdiction and the compliance of this was meticulously monitored,

- Though data entry was started simultaneously in all the districts, a few districts were carefully selected and the progress of data entry was monitored closely to understand the intricacies of data entry and issue detailed guidelines to the rest of the districts,

- As two parallel systems would always work at cross purpose with each other and probably even making the computerised system a casualty, the manual system of mutation was banned as and when Bhoomi was introduced in each taluk, after thorough preparation and testing of Bhoomi through pilot studies, as banning manual system was expected to put pressure of managing the day to day mutation requirements,

- User charges were fixed for all the services provided by Bhoomi in order to ensure that Bhoomi is self reliant,

- The required number of young, educated, committed villages officials were selected and trained on Bhoomi software for working on the system and the software was designed to minimize day to day data entry work by any other officials other than these village officials,

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- While the training of village officials was immediately started, it was decided to engage the services of data entry agencies to depute data entry operators to do day to day data entry work so that scheme doesn't suffer because of immediate lack of trained village officials. However these operators are removed as and when one year of operations is over in a sub district,

- As security is one of the key requirements for all the stages of the mutation processes in Bhoomi, which includes physical, logical and procedural security measures, as well as the security of e-documents or data have to be protected against loss, corruption and access by unauthorized personnel, Bhoomi was designed to take care of all these aspects,

- In order to ensure Integrity, Authenticity, Non-repudiation, Audit trails and Privacy, Bhoomi was designed to employ the state of the art bio-logon metrics system from Compaq, which authenticates various users on the Bhoomi software on the basis of fingerprints,

- To ensures that no body can hack the system by imitating other users and also to ensure non-repudiation, the password based security system was replaced by fingerprint authentication,

- In order to ensure non-repudiation, a provision was made in the Bhoomi for scanning original mutation orders of the revenue and notices served on interested parties,

- Bhoomi was got designed to have the capability to mange and monitor the User access which includes monitoring both functions and data to which access is allowed or restricted and also the facility to establish a common functionality for defined roles and establish user profiles (for example, a more limited access to Village Compared to that of the Shirastedar) and have a facility to add other functions to given roles at future dates, as required,

- A system was put in place to achieve the routine maintenance and upgrades to minimize any disruption to the service,

- An action plan and sufficient fund was made available for regular upgrade of technology for taking advantage of advances in technology and maintains a progressive programme of improvement and development,

- A detailed Disaster Recovery Strategy such as daily, weekly, monthly and yearly backups, having mirror image database in taluk office and in a central location, storing backup data (DAT Cartridges) in geographically different locations, preventive maintenance and along with detailed guidelines of who is responsible for what and sufficient allocation of fund was in place in order to ensure that valuable information is not lost and/or the services are restored without any delay in the event any unexpected disasters

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