Chapter 28

Directorate of Settlement & Land Records Department, Goa *

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I) OVERVIEW

LIS as basis for e-Governance

After the successful computerization of survey records in the pilot project sponsored by Ministry of Rural Development, the State of Goa recognized the utility and created **Project LRIS,** which involved computerization of 100% of maps and Record of Rights of the State and integration of the same. Project LRIS facilitated the Govt. to manage and maintain its information effectively and also reach out to the public through departmental offices issuing certified copies and Mahiti Ghars (Knowledge Houses) which are e-Kiosks issuing certified copies of record of rights as well as land plans for any land parcel across the State.

The work was inaugurated by the Hon'ble Chief Minister of Goa and Hon'ble Minister for Rural Development, Govt. of India.

The State Govt. has recognized that LIS/GIS shall become the basis for all developmental planning activities by different government departments and made Survey Department the nodal agency for all computerization of cadastral records and updating the same through a revision survey. This effort is aimed at leading to e-Governance.

Unlike some States which are only addressing the computerization of Textual Records, i.e., Record of Rights, the State of Goa realized that RoR forms only a fraction of requirement for Governance. The real foundation for e-Governance is a map-based networked information system that has all base maps and grows over a period of time to allow attachment of layers and layers of graphical and alphanumeric domain specific data. Maps are not just for use by Survey Department, but every Govt. Department needs them for their day-to-day activity.

LIS as basis for e-Governance – The Vision of the State

The Survey Department will act as a nodal agency for all maps maintenance as far as legal records are concerned. However, other Govt. Departments like

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* * *Winner of CSI e-Gov Awards, 2009-2010*

PWD, Municipal Corporations, Forest, Irrigation, Mining etc will get hooked onto the same network in future and add their own spatial data layers on these maps. The idea being promoted is of sharing data on a network, with some layers of data belonging to and under maintenance of each department, but others are also free to use it. For e.g., over a period of time, all underground cabling and networks of Telecom may get mapped by one department, however, any other department, let us say PWD wanting to do some Road Maintenance, can share this data to analyze digging caution zones. Similarly, say, for Road Widening activity, PWD may use the Survey Departments map layers to arrive at Land Acquisition details.

The ultimate concept being promoted is to have a common platform for working with a GIS for achieving transparent and effective administration of activities of all Government Departments. Each department has some shared data and some local data. By utilization of a common network for Government and appointment of rights for map and data layers updation, duplication of efforts by different departments will be eliminated over a period of time. No Govt. Department has to prepare digital maps in future, they will just use the authentic digital base maps maintained by Survey Department and only create digital layers pertaining to them. In case some layers already exist that are created by some other department, the same will be used to reduce redundancy and costs.

Also, this project paves the way to solve one of the major problems plaguing various States, namely, vexatious land disputes due to multiple or malafide transactions on land. By having a single Land Database, Registration Department can in future check up authenticity of transaction by verification of title and extent prior to registering any land transaction.

The ultimate vision for State of Goa is to have a single networked GIS platform which caters to information needs, both spatial and attribute, for public and also all Government Departments. In an effort to achieve this objective the department has implemented the following three important features in LRIS

Anywhere –Everywhere Maps : With the online updating facility in place today the department is in a position to deliver maps of any jurisdiction from any of the ISLR offices All transactions updated on the Maps : The department has also been able to project all updation with regards to Conversion/Partition and Land Acquisition on the Maps

Linking of Maps to ROR : The department has also introduced the Form-15 which is a single document giving details of the MAP and the ROR on a single platform.

Building e-infrastructure

Infrastructure is the foundation of any successful project. A project of the nature of LRIS required not only physical infrastructure but also e-Infrastructure like

- Computer Hardware
- Networking encompassing all the Talukas of Goa
- Computerization of RoR for entire State
- Computerization of base maps for entire State

In January 2003, 4 major cities were networked with Taluka Inspector of Land Records offices inter-connected and also linked to Survey Department headquarters. These cities included Panaji, Vasco, Margao and Mapusa. Each office does digital data maintenance locally, but data (Maps as well as alphanumeric database) is available for issue to public or for use by Government Departments from any site.

The Data Security has been ensured through encryption and biometric device security provided by VISION MapMaker software. Data is shared by everyone, but updated only on authentication of fingerprints of concerned authority.

Later this network, through Goa Broadband Connection, was extended across the State. As on date, Goa has computer facilities at all Talukas and Major cities which are networked and run both the Land Information System of Visionlabs, making digital map data available across the State and also run the NIC developed Record of Rights data management application, which allows citizens to apply for RoR certified copies or for changes online from across the State.

After achieving issue of Land Records From Anywhere in the State**,** the Land Records Department has taken the step forward to put all the data available from a web based GIS, making it possible to view and obtain Goa Land Records from Anywhere in the World. The solution is undergoing a pilot run on a private network and will be shortly hosted on public internet IP.

Goa is now the only state that has:

- Carried out 100% computerization of maps and Records of Rights
- Provides facilities for online updation of maps
- Has integrated maps with Record of Rights

- Provides land conversion/partition and land acquisition details along with map
- Provides Land Records from Anywhere/Everywhere

With this initiative, Goa has become the first state to carry out 100% computerization of cadastral records, making information available to public and other interested agencies online and achieving the goals of e(ffective)-Governance, namely,

- Modernization of business process
- Transparency of information
- Improved Services to public
- Improving efficiency of departmental operations

II) RESULT INDICATORS

1. Key Performance

Some of the quantifiable outcomes of the project are listed below:

100% computerization of maps, Records of Rights and the business process workflow has been achieved.

Earlier norm for issue of a copy of certified land parcel extract was 15 to 45 days from date of application. Now the department is issuing copies within a day using the GIS platform, and for applications from public involving small extracts, sometimes response time is as low as 30 minutes. For request applications for Textual Land Records also, a similar response time is now being given.

Earlier, records of an area could be requested by public only in a limited number of offices, for e.g. in DSLR, Panaji or in local Taluka SLR office. Now members of public can request for any record of the State from any of the Survey Offices of the State and also from privately managed kiosks. The Web GIS Implementation is ongoing to make the information accessible from the internet shortly. This will make information available to public from anywhere in the world. For planning purposes, people can simply browse the web and view the information of any land parcel (geometry, ownership etc). They need to visit departmental offices only for obtaining certified signed copies for legal purposes.

Mutation of both textual Record of Rights and map data is now an online process. For map mutation, earlier update onto master records used to be done after a few months. Now map mutation is a continuous process and is done within days of receiving data update from field survey.

The procedure for obtaining a certified record is also simplified. A member of public can now walk into any DSLR office, pay the prescribed fee across the

counter and collect the computerized printout with attestation by department within a short time.
With the Integration of RoR and map data, public is given the option of obtaining only certified land parcel extract or land parcel extract along with RoR/ land conversion/partition and land acquisition details.
Goan Land Records are now available online and can be viewed/printed from ANYWHERE in the world.

2. Government Efficiency Improvement

a. Time and cost efficiency improvements in the working & delivery of services

Issue of certified land parcel extracts

Earlier, members of public used to apply for an extract by paying requisite fee. All such applications would be piled up and put up to the Drawing Section. The departments Surveyor or Draftsman used to manually prepare the extract drawing and then file it for outward issue. The applicants had to make multiple visits to the departments offices to ascertain whether their certified copy is prepared or not. The certified copy used to be issued in a time frame of 15 to 45 days from the date of application.

Now with the computerization and software solution in place, the actual process of preparing a land parcel extract is automated and takes only a few minutes. Depending upon number of applications received and in queue at that time, issue of extract is done within 15 minutes to 2 hours.

Maintenance of Survey Records

Earlier process of mutation of survey record on partition, consolidation or acquisition was totally a manual process taking a long time. Now only the field verification process is manual. The updating procedure workflow is automated thereby mutations/changes to land parcel are being effected rapidly.

b. Specific innovative ideas implemented in eGov area; and their impact on services

Distributed Issue and Maintenance of Land Records

As in earlier system, maintenance of land records and issue of certified extracts is still a distributed process. However, by virtue of networking all Taluka and City Offices on a common GIS platform, data is available across the State. Issue of land records to public, Private or Government Agencies can be done from any office in the State.

Data Security

To prevent malafide tampering of land records which have a legal nature, entire data is encrypted and cannot be edited without the computerized business process workflow. Approved Digital Maps are archived and available in Read Only Mode. This mode is used for issue of records to any applicant. For updating, a three level biometric authentication is carried out. Some Draftsmen or Surveyors are given Updating Authority. They can create a new version and carry out mutation of map/land parcel using Land Information System (LIS) software giving their biometric signature. Some Talatis/Mamlatdars are given Verification Authority. They have to verify the update and affix their biometric signature on the new version. Some Mamlatdars/Inspectors of Land Records are given Approval Authority. They have to affix their biometric signature to approve a verified update.

Only after approval, the new version of PT Sheet is baselined by software and made available for issue against application. The Land Information System software does not allow editing of any old version of map. Further, on taking any land parcel extract, it tags the printout with the date of the version, in case an older version is taken. Older versions may be printed to resolve disputes whereby old and new version extracts are required to identify and verify changes that have occurred.

The web based service delivery model also ensures data security in its inherent architecture. The Web Server that is accessed by public over internet has a copy of the map and RoR data from the Departments LIS Server. A Web User has no direct connectivity to the Departmental Server, whereby the master data cannot be hacked into.

Maps on the Move

The Department has taken another innovative approach of doing away with issue of copies of paper maps for field verification. 200 netbooks (compact notebook computers) with relevant maps and viewing software are issued to Talatis, so that they can easily view and verify location, extent, ownership, tenancy and features of any land parcel during the field verification process that is mandated for mutation procedure. These netbooks also provide a quick view of spatial and non-spatial information to any members of public who are not looking for a certified copy but only want information.

c. Services integrated with other departments

The Settlement and Land Records department is now servicing inter-departmental requests for land parcel, PT sheet or Village Maps rapidly by providing them with software generated copies. Such requests frequently come up for activities such as land acquisition, planning etc. For e.g., the

agency carrying out preparation of Detailed Project Report for widening of the National Highway has been provided with the maps, with their surveyed road alignment and proposed alignment superimposed, to enable them to assess and report the land acquisition requirements. Similarly, digital maps have been used for planning and identifying the layout for proposed new International Airport.

III) ENABLER INDICATORS

1. Department Policy & Strategy

a. eGov/ICT vision roadmap for District and its current status

The ICT vision roadmap for the Settlement and Land Records was as below:

Modernize the Land Records Maintenance Process

Towards this goal, the entire land records of the State, both graphical (maps) and alphanumeric (Record of Rights) are 100% computerized and being managed by use of software technologies that are tailored to handle the departments business process and workflows.

Faster and convenient delivery of services

Issue of records to any applicant – land owner, prospective buyer, planner, financial institutions, government agencies etc – is now possible from any of the offices of SLR across the State. The delivery of certified land parcel extracts using internet will be available within a span of 2 to 3 months, after a thorough test run is concluded.

Accurate and Up to date information

Every possible care is being taken towards accuracy of digital data and also, the department is addressing any grievances and complaints that come up. The department has also undertaken a resurvey project for the entire state and expects that in a time span of 12 to 24 months, all the digital maps will be updated with the latest survey data.

Land Records from Anywhere

Total transparency of information is achieved by hosting entire map and Record of Rights data online and providing access to certified records from Anywhere.

The Legacy – Sharing Spatial Data Across Government Departments

In addition to already implemented practices, the next segment in the roadmap is to enable any government department to utilize the spatial data through an online connection via the Goa Broadband. It is the vision of Goa

that in future, the custodian department of a particular data layer will have the mandate and means to update those layers and authenticate it. For e.g., PWD can update any changes to their road networks. Electrical Department can update information on electrical network and assets. Registration department can host the land title transaction data onto the same Server. The present system of each department doing its own spatial surveys and not updating other departments information will be done away with by having a centralized spatial information repository. The appropriate authentication mechanisms, access privileges and business process for such shared Spatial Data Infrastructure have to be worked out to achieve the goals of Map based e-Governance for every Government Department that handles spatially distributed assets/infrastructure or services to spatially distributed populace.

The department is also planning to initiate georeferencing of the maps to bring them from the current Goa Grid Reference to a national geodetic framework. This will enable easy integration for planners who are using referential information like Satellite Imagery or GPS/DGPS.

b. To what extent the common infrastructure (national, state, other District; delivery channels) is being shared

At present, spatial data and RoR is shared with other departments on demand. The NIC's statewide network is being used by all departments. LRIS Project operates on the same Goa Broadband Network. The Web services being rolled out will be on a separate static IP due to security reasons.

c. Technology standardization policy and its implementation

The department has standardized on indigenous Geographic and Land Information System developed by Visionlabs, which has been highly customized over the years to the survey practices of Goa and has custom business process and workflow implementation for the department. Standardization of indigenous technology was done after evaluating various GIS software and the key factors influencing the selection of indigenous GIS were:

a. The software is customized for Survey System of Goa
b. The software embeds the business process workflows of Survey Department, is Cost-effective and saves foreign exchange
c. Promotion of local employment and technology development

2. Process reengineering & Legal Reforms

a. Major front end process changes includes

The front end process changes planned were:

Faster delivery of information
Status – Implemented through software generated certified land record copies

Delivery of certified copies from anywhere in the State
Status – Implemented through networking and making the survey and land records data available from a centralized server

Payment with Application for a record and immediate delivery
Status – Implemented through G.O. notification enabling spot collection of requisite fees and issue of computer generated extract

Land Records from Anywhere
Status – Under implementation through web based service enabling collection of payment through credit/debit card and generation of certified land parcel extract viewable/printable from common internet browsers. Pilot testing done. System expected to be operational in 2 to 3 months.

The necessary legislation changes for payment collection, authenticity of computer generated record and authorization to issue certified land records by private kiosk operators have already been carried out. The required government notifications for online (web based) payment collection, pricing of data product and information dissemination through web services have to be framed and issued.

b. Major back- end process changes includes
The back end process changes planned were:

Software based secure and auditable maintenance of land records
Status – Implemented through customized Geographic and Land Information System with biometric security, multi-level authentication and archival of historical data of every land parcel

Online web based dissemination of information and audit
Status – Under implementation. The web based software system provides for features for maintaining transaction and audit trails. The business process of consolidation of online payment receipts and accounting is being established. The department also proposes to provide manual authentication in case any individual or agency seeks confirmation of a transaction/printout carried out over the internet, by cross-checking with software database and unique Transaction ID and archived issued record.

3. Capacity Building

a. Leadership support & visibility and current status

The success of any project has various components, and Project LRIS too, had its contributors.

The Govt. itself, right from the Hon'ble Chief Minister of the State, Secretaries of IT and Revenue, Departmental Heads and Survey/Revenue Department functionaries worked in a synchronized manner to achieve this massive task of creating the necessary physical and e-infrastructure, coordinating the developments and taking the benefits to public.

State NIC extended its excellent support with the development of work flow application for textual RoR data management and helped in technically coordinating the activity of setting up of network connectivity.

Goa Electronics Ltd. was selected to coordinate the implementation of computerization and workflow relating to map data. They partnered with M/S Visionlabs, Hyderabad, who had earlier successfully carried out the pilot project. Visionlabs extended their indigenous LIS/GIS software VISION MapMaker and mapping services, which gave 100% accuracy in digital maps and also incorporated modules for Biometric Security, Map Versioning and Archiving, e-Kiosk software, multiple levels of authentication/approval of mutation, automatic extraction and printing of copies any selected land plan, integration with RoR and development of customized Web GIS for issue of certified copies of survey/land records through any PC connected to the Internet.

The following personnel have ensured the success of this project ;

- Shri Jose Phillip: Honb'le Revenue Minister for the State of Goa. For granting all the required permission and sanctions for the project
- Shri Mihir Vardhan :Directorate of Settlement and Land Records, Goa. I have been involved with this project from the conceptualization to the implementation stage. My objective is to use Information Technology to make a positive difference in the lives of individuals.
- Shri Pednekar :Inspector of Settlement and Land Records, Being the nodal officer he has been involved in bridging the gap between the technical and the non-technical personnel by organizing workshops, meetings and training sessions.
- Shri J.J.R Anand : State Informatics Officer, National Informatics Center- Goa, for all his support and guidance in implementation of this project.

- Ms.Revati Mujumdar : CEO, Goa Electronics Limited, for co-ordinating and guiding development of LRIS as per requirements of Directorate of Settlement and Land Records.

b. Change management strategy defined and status thereof

Map Mutation

The procedure of map mutation has been put into a business process workflow as specified earlier in this document.

Resurvey

The resurvey data integration mechanisms have been defined and some of the villages data has been integrated. The process of data integration for the entire state will be taken up shortly.

Transfer/Superannuation of Personnel

The trained department staff and also staff holding various authorities in the computerized business process workflow are prone to transfers or superannuation. This aspect is taken care of in policy definition for user management by the Administrator in the Enterprise GIS/LIS in the state-wide network.

c. Capacity building plan and its implementation status

Various training programmes were held for individual and group training to various users of the Land Information System. The training was at different levels – Computer Operators, Draftsment, Surveyors, Talatis and ILRs. A resident engineer of the implementing agency is deployed who imparts need based support and training to new inductees.

Presently all 11 Taluka Offices and 4 City Offices are having trained personnel handling the spatial and non-spatial data and performing normal business operations like:

- Issue of records to public
- Issue of records to other agencies on request
- Updating of maps and RoR during mutation process
- Integration of resurvey data

d. Are the Program Management Teams there full time (department officials/ consultants)

LRIS project has reached a stage of maturity where all concerned department officials are already trained. The LRIS program is being managed and monitored by Director of Settlement and Land Records with the support of

Technical Director, NIC State Unit, Engineers of Goa Electronics Ltd. and Technical and Maintenance Support from Visionlabs.

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