

I. EXCELLENCE IN GOVERNMENT PROCESS RE-ENGINEERING

e-SWATHU - A Property Management System for Panchayats*

1. Background

Land Administration involves administration of both agricultural and non-agricultural land. Land records management during pre-British period was mainly to assess and collect the land revenue as it was the biggest source of revenue to the state. During British rule in India, Survey activities were initiated towards end of 18th Century by East India Company primarily to establish their rule and with an intention to collect revenue. As part of this process village boundaries were fixed and inside detailed survey was left to local surveys. In 1767, survey of India was established to carry forward the survey activity which is basis for creating land records. While performing these surveys prime focus was on revenue earning pockets and thereby agricultural lands in rural areas and residential plots in the towns and cities were selected for survey and creating of record of rights / property records.

Though survey of rural agricultural lands done under the title 'Revenue Survey' covered most of the villages except Inam and Jodi villages where land parcel boundaries were not fixed as the land revenue of these villages was not remitted to government and instead was collected by Inamdars or Jodidars. Since Land Revenue was comparatively more than that of revenue that one could have mobilized from residential properties, no survey work and preparation of ownership records was taken up in the area of habitation. As mentioned earlier, importance was given to agricultural land in demarcating boundaries of land parcels by giving unique identity called survey numbers within the village. Village maps thus prepared showed village habitation as "settlement" popularly known as "Goutan" or 'Gramathana" with boundaries without getting into details of residential properties within the village. Survey of plots within big towns / cities was done under the title 'City Survey" where non-agricultural lands were surveyed and mapped to enable creation of property records.

The basis for creating appropriate property records of either agricultural lands or nonagricultural lands has been spatial data by age old practice barring few exceptions like Britain, no property records have been created for properties within the habitation area of the village where survey of individual parcels of residential properties have not been carried out all across Karnataka.

Karnataka Land Revenue Act 1964 which is the act in force now for managing, land mentions about managing buildings and building sites along with agricultural lands. Detailed procedure of preparing property records has also been defined.

** SWATHU in Kannada means property*

City Survey which is in practice in 48 towns / cities across Karnataka derives power from these provisions of chapter 13 of Karnataka Land Revenue Act 1964 and chapter 12 of Karnataka Land Revenue Rules 1966.

Though law was in place, preparation of property records for residential properties was not attempted; some of the main reasons for the same are as follows:

1. Laborious nature of activity involving skilled manpower.
2. No demand for property records as registration department, Banks and financial institutions started using tax records maintained by local bodies to identify the property and owner.
3. Apathy of state governments towards creating proper property management system using modern technologies.
4. Due to insignificant number of transactions pertaining to properties within habitation area / gramathana prior to 90's (when urbanization was not in full swing).
5. City survey was not extended beyond 48 towns / cities in Karnataka. Even in these 48 towns, jurisdiction of city survey has not been increased due to one or more reasons indicated earlier.

Since city survey was not in place to maintain property records in the villages, demand registers created using house lists became defacto property records without legal sanctity. Tax account extracts / extract of Demand Collection and Balance register of properties maintained by local bodies popularly known as Khatha extracts are considered as property records in the absence of non availability of proper ownership document.

2. Introduction

In Karnataka, the Grama Panchayats which are local bodies in the rural areas maintain tax accounts of properties within the village limits. These records are maintained as per the ***Karnataka Panchayat Raj act (Budget and Accounts Rules), 2006***. These Grama Panchayats create and maintain documents called **Form-9** and **Form-11** which are used as substitute documents for registration and sanctioning loans by banks and financial institutions. The main objective of Grama Panchayats is to provide civic amenities to citizen and collect property tax. The maintenance and management of property records is not the domain of these local bodies. As mentioned earlier since Revenue Department which was supposed to maintain property records is not maintaining the property records with respect to non-agricultural properties in villages, **Form-9** and **Form-11** maintained by Grama Panchayats for collecting property tax are being used as property records for all property transfers.

The major focus of Grama Panchayats or any local body is to bring more and more properties into tax net rather than finding out the veracity of the property documents

before taking them into demand register of property tax. This has resulted in inserting large set of illegally created properties without following prescribed procedures into demand registers. Such illegally created properties would not have changed land use, would not have gone through the department of town and country planning approvals for new layouts in the peri-urban areas. This has not only resulted in revenue loss to the government but also responsible for haphazard growth of cities making it difficult to plan infrastructure schemes for present and future requirements. Further mushrooming of illegally created properties have huge impact on the functioning and growth of cities, availability and access to affordable land and housing by tens of millions of poor people and the effective functioning of economic efficiency of domestic and international enterprises.

McKinsey report of 2001 states that “The poor management of peri-urban and urban land records (land records of non agricultural properties) and of processing property transactions is one of the leading constraints to more effective economic development, investment choices and urban land market functioning in India”. Law commission of India 2013 in its Draft National Land reforms policy, 2013 highlights the importance of efficient land records system quoting following benefits:

- Clarity and transparency promotes a more cohesive environment for land markets to function efficiently.
- Financial institutions such as banks benefit if property offered as collateral has no ambiguity in terms of ownership and use.
- Efficiency in taxation systems is premised on clear identification of proper land records and terms of use of property, including the incorporation of correct and updated mutation details.
- The judiciary can potentially resolve disputes faster regarding land if records are properly maintained and available.
- The citizen benefits from clear and transparent land records system available in public domain.

3. Conceptualization of e-SWATHU

Rural Development & Panchayat Raj department of Government of Karnataka felt that registration of illegal properties should be stopped immediately by adopting software solutions and that stopping transactions on illegal properties is the best way to stop creation of such properties. It was noted RD & PR, Government of Karnataka that only IT systems can impose such discipline in the government departments. As a result an e-Governance solution called e-SWATHU for managing property records of villages was conceptualized, designed, developed and implemented by National Informatics Centre for Rural Development and Panchayat Raj department with following objectives:

e-SWATHU - A Property Management System For Panchayats

- Maintaining up-to-date records with respect to ownership, extent, dimension, etc., of properties under the jurisdiction of Grama Panchayats.
- Process to undertake updations due to various transactions such as sale, inheritance, partition, gift, will, land acquisition, etc.,
- Facilities to create new property records which are coming up after following due process under law.
- Issue of records as and when owner / citizen demands for it.
- Electronic data exchange with registration department.
- Electronic data exchange with Local Town Planning Authorities.
- Implementation of court decree, managing addition and removal of court stay.
- Incorporation of liabilities on the property and removal of the same as and when demanded.
- Maintaining flags against each property with respect to government restrictions such as PTCL, Non alienation conditions, government / Grama Panchayat property, restrictions imposed by LPAs / Director town Planning etc.,

Rural Development and Panchayat Raj department had created database of all the properties listed in the tax demand register in individual Village Panchayats through IT solution called PANCHATANTRA. While adding properties to Panchatantra database, no check was done to ensure that entries were added for legally created properties only. This resulted in a situation wherein Panchatantra data could not be used directly to issue Form-9 and Form-11 which are mandated by Revenue Department for registration of non-agricultural properties.

Government decided to create new database under the project called e-SWATHU to ensure that clear distinction is available in the database among legally created properties and properties created without following due legal provisions. Since all relevant documents required to verify and validate the legality of property creation were not available with Village Panchayats, Government decided to implement the project in incremental approach. The property records are being created based on the demand and onus of providing required documents is on the citizen.

Synchronization between e-SWATHU and Panchatantra was critical as Panchatantra has details of about one crore village properties and whole of budget and accounting software of Village Panchayats is using tax details from Panchatantra database for accounting purpose. While designing e-SWATHU project, care has been taken to ensure that e-SWATHU handles only ownership information and Panchatantra continues to handle tax details. Both softwares will exchange the data through web services for synchronization using property id as key parameter for data exchange.

4. Coverage – Geographical and Demographic

e-SWATHU has been designed to cater the needs of managing non agricultural property records of rural area all across the state. All the processes have been standardized and have been made common all across the state. Since 14-06-2013, e-SWATHU has been implemented in all 5,629 Grama Panchayats belonging to 177 blocks of 30 districts across the state. Citizen can obtain his / her non agricultural property documents across the counter from any of the 5,629 Grama Panchayats. Further all the stakeholders can check the veracity of the documents issued by visiting e-SWATHU website. (<http://e-swathu.nic.in>).

Karnataka's 61.33% of population lives in villages (according to 2011 census) and e-SWATHU covers non agricultural properties belonging to all of them which works out to be nearly 3.75 crore people. Distance citizen needs to travel to reach his/her Grama Panchayat office to avail any service from e-SWATHU project is approximately 0 – 3.5 KMs.

5. Situation Before the Initiative

While the situation before the initiative has been discussed in brief under *Background* and *Introduction* sections, actual scenario existed before the initiative is comprehensively discussed in this section. As indicated in earlier sections through Karnataka Land Revenue Act 1964 provided for managing non agricultural properties along with agricultural properties spread across both rural and urban areas, Revenue department is managing only agricultural properties all across the state and non agricultural properties in 48 towns / cities under city survey. There are about 160 towns / cities and 30,000 villages where property records are not maintained at all. Even in 48 towns where city survey is in place, city survey jurisdiction has not been expanded resulting in city survey exists only for part of the city / town. Due to lack of completeness with respect to area of operations in the city survey, these records have not been made mandatory for any transactions.

Due to the non availability of property records in villages, vacuum was filled by extracts of demand registers maintained by local bodies such as Grama Panchayats and Municipalities / corporations to transact properties and to avail loans from banks and financial institutions. As discussed earlier demand registers of local bodies are maintained to collect the property tax for providing public amenities and not for ownership purpose. As a result demand registers have properties which are legally created and also properties which have been created without following the provisions of law. As per the Section 21 in The Registration Act, 1908 producing the document to identify the property uniquely is mandatory, tax / demand register extracts are being used for registration purpose. Since tax register extract maintained by Grama Panchayat did not contain details like dimensions and boundary details which are essential for identifying the property uniquely as per section 21 of the registration act, a format was created by vested interests which is not prescribed under any act or rules to circumvent the provisions of registration act.

There were instances wherein fraudulent tax / demand register extracts (Form-9 and Form-11) were created by unscrupulous elements without the knowledge of Grama Panchayats for registering illegally created properties. Sub Registrars did not have any mechanism to verify the authenticity of the document except sending it to Grama Panchayats physically which was done after registration process is over. After transactions were completed neither sub registrar nor Gram Panchayat officials bothered about the fraudulent transaction. There were also instances wherein Gram Panchayats had issued fabricated documents and did not maintain any record for issuing such documents. These activities resulted in rampant growth of illegally created properties which resulted in huge revenue loss to the government and also chaotic growth of urban agglomerations.

6. Extent of Process re-engineered

Process re-engineering was carried out by RD & PR department to stream line the property record management for properties coming under the jurisdiction of Grama Panchayats. Following six major activities involved were accomplished as part of process re-engineering for achieving objectives of e-SWATHU:

- Process re-engineering in Acts and Rules.
- Executive orders banning manual records
- Workflow based process for generation of property documents and mutation
- Electronic integration of e-SWATHU with KAVERI (Registration process)
- Electronic Integration of e-SWATHU with e-VINYASA (Layout approval process of LPAs / UDAs)
- Services offered as a result of process re-engineering

Each one of these activities is described in detail in following sub sections.

6.1 Process re-engineering in Acts and Rules.

After detailed brainstorming sessions, Rural Development and Panchayat Raj department decided to undertake following Government Process Re-engineering and accordingly amended **Karnataka Panchayat Raj act (Budget and Accounts Rules), 2006 vide notification No: RDP 83 GPA 2013, Bangalore Dated 14-06-2013**. With an intention to make Form-9 as document similar to ownership record instead of just tax account, Rural Development & Panchayat Raj department introduced a new register called FORM-9A which is a master register with all the relevant data pertaining to non-agricultural properties. As per the amendment, Form-9A register contains all the information which is required for any property / ownership record. Following table gives details of the contents of Form-9A register.

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Form 9A Register

Sl.No	Column Name	Description
1.	District	Code / name of the district
2.	Taluk	Code / name of the Taluk
3.	Grama panchayat	Code / name of the Grama Panchayat
4.	Village	Code / name of the Village
5.	Asset I.D. No.	Unique 18 digit code for each property
6.	Old Asset I.D. No.	Old property id for back reference
7.	Original Survey No before conversion	Survey number is unique number through which one can identify the land using survey data. This will give link to history of the property
8.	Name of the owner of the Asset / Name of Joint owners	Multiple names can be captured in case of joint owners
9.	Name of Father / Mother / Husband / Wife of owner / Joint owners	Multiple names can be captured in case of joint owners
10.	Owner / Joint owners photo	Photos of all the owners
11.	Address of the owner / Joint owners	Address of all the owners
12.	Identification proof of the owner / Joint owners	Identify proof in terms of photo id cards such as Pan card, Driving License, Ration Card, Aadhaar card, EPIC and passport
13.	Name of the Occupant	Name of the occupant
14.	Biometric thumb impression of the owner / Joint owners of the Asset	As of now not made compulsory due to implementation challenges
15.	Site Area	Area of land in square Meters
16.	Built up Area	Built up area if building exists in Square meters
17.	Mutation Register No	Mutation register number showing how current owner/s became owners
18.	Mutation Register Date	Date of mutation through which current owners name was entered in property record
19.	Grama Panchayat Resolution No	Resolution number of Grama Panchayat board meeting which took decision to incorporate mutation
20.	Grama Panchayat Resolution Date	Resolution date of Grama Panchayat board meeting which took decision to incorporate mutation
21.	Dimension (In mt.)	Dimension from east to west and North to south
22.	Checkbandi- North	Properties / amenities situated to the North
23.	Checkbandi- South	Properties / amenities situated to the South
24.	Checkbandi- East	Properties / amenities situated to the East
25.	Checkbandi- West	Properties / amenities situated to the West
26.	Nature of the Asset (Building)	Indicates roof type like Thatched roof or Hut / Tiled roof or sheet / Maalige or Concrete or stone roof / others

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27.	Type of Asset	Residential / Commercial / Industrial / others
28.	Classification of Asset	Grama Thana / Approved layout / Sanctioned through Beneficiary schemes / Farm House or Form-11B properties / KIADB approved industrial layout or sites
29.	Acquisition Type	Acquisition type through which current owner acquired the property for ex. Sale, partition. Gift, will, inheritance, court order / decree, donation, grant etc.,
30.	Asset identification documents	List of documents to prove that the property is legally created one.
31.	Asset Photo	Photo of the asset
32.	GIS coordinates of the property	Geo referential co-ordinates to identify the property boundaries. (currently not mandatory)
33.	Rights	Easement rights of others on the property like right to path, right to fruit, right to water flow etc.,
34.	Liabilities	Liabilities on property such as Government restriction / Government property / Bank loan etc.,

Table 1.0

During Government Process Re-engineering (GPR) it has been decided that Form-9 will be sub set of Form-9A register. It is interesting to note that Form-9 notified under **Karnataka Panchayat Raj act (Budget and Accounts Rules), 2006** before amendment had very few parameters and focus was only on tax collection. Following tables show contents of Form-9 before and after amendments.

Sl.No	Columns in Form-9 before GPR	Columns in Form-9 after GPR
1.		District name
2.		Taluk name
3.	Name of the Gram Panchayat	Grama panchayat name
4.	Name of the village	Village name
5.	Identification of property	Asset I.D. No. (18 digit unique Id)
6.		Old Asset I.D. No. (for back reference)
7.		Original Survey Number before conversion
8.	Owner(s) name (Owners separated by comma which cannot be processed digitally)	Name of the owner of the Asset or / Name of Joint owners (Multiple names can be captured in case of joint owners)
9.		Name of Father / Mother / Husband / Wife of owner / Joint owners
10.		Owner / Joint owners photo
11.		Address of the owner / Joint owners
12.		Identification proof of the owner / Joint owners
13.		Biometric thumb impression of the owner / Joint

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		owners of the Asset (Not captured due to implementation issues)
14.	Property area	Site Area in Square meters
15.		Built up Area (with break-up of different types of properties usage)
16.		Mutation Register No
17.		Mutation Register Date
18.		Grama Panchayat Resolution No
19.		Grama Panchayat Resolution Date
20.		Dimension (In mt.)
21.		Checkbandi- North
22.		Checkbandi- South
23.		Checkbandi- East
24.		Checkbandi- West
25.		Nature of the Asset (Site /Building)
26.		Type of Asset (Residential / Commercial/ Industrial / Others / Apartment)
27.		Classification of Asset (Grama Thana / Approved layout / Government Beneficiary scheme)
28.		Acquisition Type (sale / inheritance, partition/ etc.)
29.		List of documents to classify the Assets
30.		Asset / Property Photo
31.	Year wise tax to be paid (past 4 years)	Total Demand
32.	Tax Paid year wise (past 4 years)	Tax paid
33.		Balance to be paid
34.	Remarks	Remarks
35.	Name of the occupant	Available in Form-9A register, not relevant for property document
36.	House rent per annum	Not relevant for property record

Table 2.0

During Government Process Re-engineering (GPR) it was noticed that Form-11 which was being issued to both legally created properties along with Form-9 to provide more details about taxation and for illegally created properties where Form-9 could not be issued was creating lot of confusion among the property owners as well as for accepting authorities. Accordingly it was decided to have different formats for FORM-11 document; Form-11 issued along with Form-9 was notified as Form-11A and properties for which Form-9 cannot be issued but Form-11 can be issued for taxation purpose was notified as Form-11B. Form-11A will be sub set of Form-9A register as Form-9 and Form-11A will always go together. It is interesting to note that Form-11A notified under **Karnataka Panchayat Raj act (Budget and Accounts Rules), 2006 vide notification No: RDP 83 GPA 2013(P-6), Bangalore dated 21-01-2014** after amendment had very many parameters compared to

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what was existing before Government process re-engineering. Following tables show contents of Form-11 and Form-11A before and after amendments.

Form-11 / Form-11A

Sl.No	Columns in Form-11 before GPR	Columns in Form-11A after GPR
1.		District
2.		Taluk
3.	Name of the Gram Panchayat	Grama panchayat
4.	Name of the village	Village
5.	Assessment No	Asset I.D. No.
6.	House Number	Old Asset I.D. No.
7.	Owner Name	Name of the owner of the Asset or / Name of Joint owners
8.		Name of Father / Mother / Husband / Wife of owner / Joint owners
9.		Owner / Joint owners photo
10.		Address of the owner / Joint owners
11.		Identification proof of the owner / Joint owners
12.		Biometric thumb impression of the owner / Joint owners of the Asset
13.		Site Area
14.		Built up Area
15.		Dimension (In mt.)
16.		Nature of the Asset (Building)
17.		Type of Asset
18.		Classification of Asset
19.		Type of transaction
20.		Asset identification documents
21.		Asset Photo
22.	Mutation Register Number	Not included as it is part of Form-9
23.	Mutation Register Date	Not included as it is part of Form-9
24.	Name of the occupant	Available in Form-9A register, not relevant for property document
25.	Demand type	Removed due to redundancy
26.	Assessment	Removed due to redundancy
27.	Current Year Demand details	Total demand for the current year....
28.	Previous Year's Tax details	Demand of previous years
29.	Tax to be paid	Gross Demand
30.	Receipts	Tax paid
31.		Balance to be paid

Table 3.0

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Form-11B which was introduced to capture and store information pertaining to illegally created properties which were already under the tax net was designed to have following information:

Form - 11B

Sl.No	Column Name	Description
1.	District	Name / Code of the district
2.	Taluk	Name / Code of the taluk
3.	Grama panchayat	Name / Code of the Grama panchayat
4.	Village	Name / Code of the Village
5.	Asset I.D. No.	Unique 18 digit code for each property
6.	Old Asset I.D. No.	Old property id for back reference
7.	Original Survey No before conversion	Survey number is unique number through which one can identify the land using survey data. This will give link to history of the property
8.	Name of the owner of the Asset or / Name of Joint owners	Multiple names can be captured in case of joint owners
9.	Name of Father / Mother / Husband / Wife of owner/Joint owners	Multiple names can be captured in case of joint owners
10.	Owner/Joint owners photo	Photos of all the owners
11.	Address of the owner/Joint owners	Address of all the owners
12.	Identification proof of the owner/Joint owners	Identify proof in terms of photo id cards such as Pan card, Driving License, Ration Card, Aadhaar card, EPIC and passport
13.	Biometric thumb impression of the owner/ Joint owners of the Asset	As of now not made compulsory due to implementation challenges
14.	Site Area	Area of land in square Meters
15.	Built up Area	Built up area if building exists in Square meters
16.	Dimension (In Sq. mt.)	Dimension from east to west and North to south
17.	Checkbandi- North	Properties / amenities situated to the North
18.	Checkbandi- South	Properties / amenities situated to the South
19.	Checkbandi- East	Properties / amenities situated to the East
20.	Checkbandi- West	Properties / amenities situated to the West
21.	Nature of the Asset (Building)	Indicates roof type like Thatched roof or Hut / Tiled roof or sheet / Maalige or Concrete or stone roof / others
22.	Type of Asset	Residential / Commercial / Industrial / others
23.	Classification of Asset	Converted land / Agricultural land / Lands if exempted under section 95(2) of the Karnataka Land Revenue Act 1964 / Farm building (farm house, silk rearing house,

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		poultry, cows shed, sheep and swine shed and other allied)
24.	Acquisition Type	Acquisition type through which current owner acquired the property for ex. Sale, partition. Gift, will, inheritance, court order / decree, donation, grant etc.,
25.	Asset identification documents	List of documents to prove that the property belongs to owner and falls under specified category in Sl. No 24.
26.	Asset Photo	Photo of the asset
27.	Total Demand	Total Demand
28.	Tax paid	Tax paid
29.	Balance to be paid	Balance to be paid
25.	Mutation Register No	Mutation register number showing how current owner/s became owners
26.	Mutation Register Date	Date of mutation through which current owners name was entered in property record
27.	Grama Panchayat Resolution No	Resolution number of Grama Panchayat board meeting which took decision to incorporate mutation
28.	Grama Panchayat Resolution Date	Resolution date of Grama Panchayat board meeting which took decision to incorporate mutation

Table 4.0

It is conspicuously clear from the above tables that lot of government process re-engineering was carried out before converting a tax document into an almost nearer to property / ownership document.

After amendments, Form-9 which was being issued to legally created properties, has been restricted to properties under following categories:

- All properties for which Tahsildar of the taluk has issued certificate of declaration stating that the property falls within the Grama Thana (Village limits defined in original survey) limits.
- Duly converted as per the provisions under the Karnataka Land Revenue Act, 1964 by the Revenue Department and also have approved layout plans sanctioned as per the Karnataka Town and Country Planning Act 1961.
- All properties sanctioned by Government under various government schemes such as Basava housing scheme, Ambedkar housing scheme and Indira Awaas Yojana etc.,
- For properties which are approved for industrial purpose by KIADB.
- Apartments which have been approved by competent authorities as defined in Karnataka Town and Country Planning Act 1961.

Form-11A is being issued along with every Form-9. Form -11A register is also called as Register of Demand, Collection and Balance of land and building for properties where Form-9 has been generated / issued.

Form-11B is a document issued by Grama Panchayat for non-agricultural properties for which Form-9 cannot be generated as property is not created following legal provisions mentioned above. However Grama panchayat can charge property tax for the property as they will be providing basic amenities to people living in such properties. Form-11B can be issued to properties which already exist in demand register. Government has ensured that no new form-11B can be generated after cutoff date (14-06-2013) during process re-engineering activity. Owners of the properties having Form-11B cannot transact their properties unless following conditions are met:

- At least there should have been one transaction recorded prior to 14-06-2013. (The day e-SWATHU came into existence). This will ensure that citizens who have invested their hard earned money would not be barred from transacting. However the system will ensure that no new illegal properties can be created as illegal layout owners cannot sell the sites created without following prescribed laws and procedures.
- At least one month electricity bill or statement of account existence for period prior to 14-06-2013 should be available with owner. This has been introduced to take care of people who have constructed houses in their own agricultural land and living there since long.

6.2 Executive orders banning manual records

Rural Development & Panchayat Raj department has issued government order banning manually written Form-9, Form-11A and Form-11B. Registration department has been advised to register properties only on the basis of Form-9, Form-11A and Form-11B issued from e-SWATHU software which has digitally signed bar code of Panchayat Development Officer. All other stakeholders have been informed not to accept manual records issued from Grama Panchayat with respect to Form-9, Form-11A and Form-11B.

6.3 Workflow based process for generation of property documents and mutation

In the manual process there was no well-defined procedure with respect to taking property in to demand register or performing mutations. Every Grama Panchayat had its own procedure for bringing property in to tax net. The formats used for storing property information in demand register were different from the demand register extracts issued to the citizen for the purpose of registration and other legal matters. Different procedures were followed in different Grama Panchayats for performing mutation.

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After inception of e-SWATHU, workflow process has been defined and every official in the Grama Panchayat has been assigned with specific job so that he can be made accountable. Roles and responsibilities have been well-defined in such a way that officials in lower hierarchy would perform activities such as data entry, scanning and uploading of documents, printing of checklists and reports etc., Supervisory role has been given to next level where officials can check the work done by the lower level officer and take decision either to forward for approval or return to lower level with specific remarks. Lower level official can rectify the mistakes highlighted and re-submit the transaction with compliance for the remarks raised by supervisory role. Approving authorities also have been given facility to approve, reject or return to supervisory role official. Officers at taluk / block level, District level and State level have been provided role to verify the activities that are being carried by Panchayat Development Officer at Grama Panchayat level.

Following figure depicts process of data capture and generation of Form-9 / Form-11A/ Form-11B.

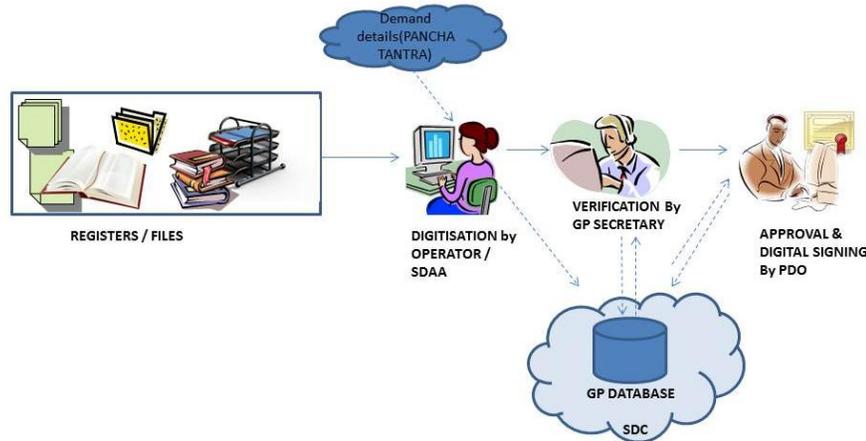


Fig 1.0

Following flow charts show how transaction flow is achieved in the well defined workflow for generation of new property record (Form-9 / FORM-11A / Form-11B) in e-SWATHU after process re-engineering.

Workflow for generation Form-9 / Form-11A/ Form-11B:

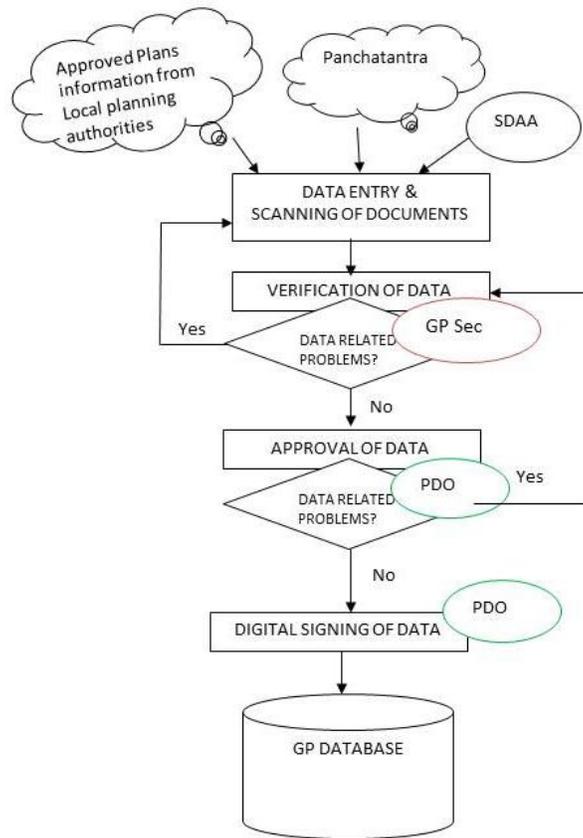


Fig 2.0

Following figure depicts process of mutation on Form-9 / Form-11B. Mutation module in e-SWATHU handles following types of mutations

- Sale
- Inheritance
- Partition
- Gift
- Will
- Sub Division of properties
- Amalgamation of properties

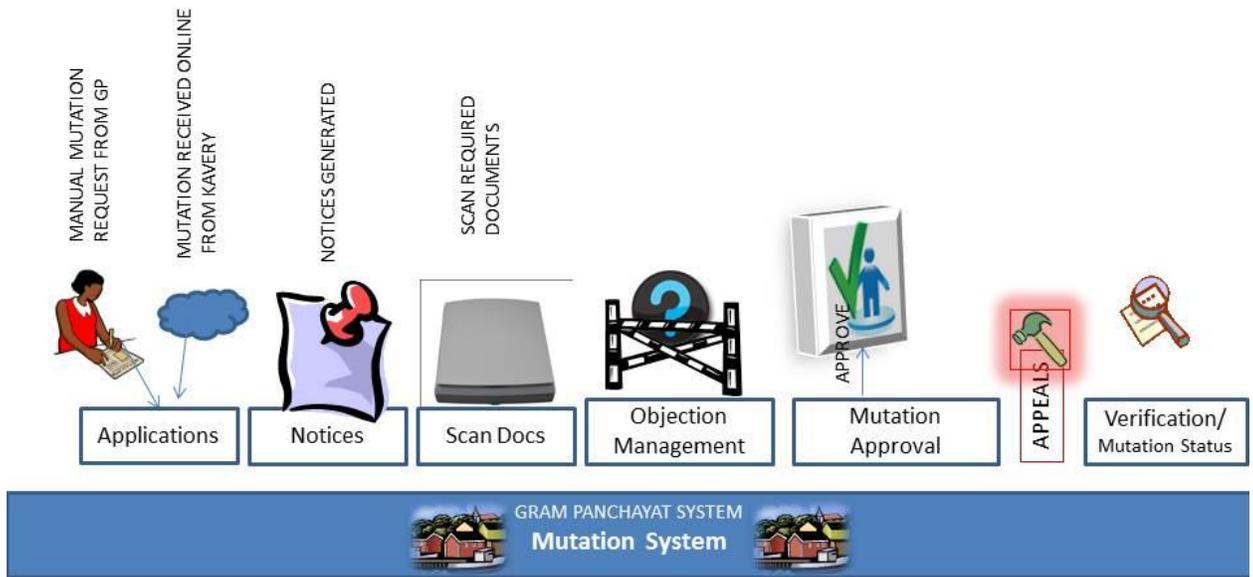


Fig 3.0

Following flow charts show how transaction flow is achieved in the well defined workflow for mutation in e-SWATHU.

Mutation Process

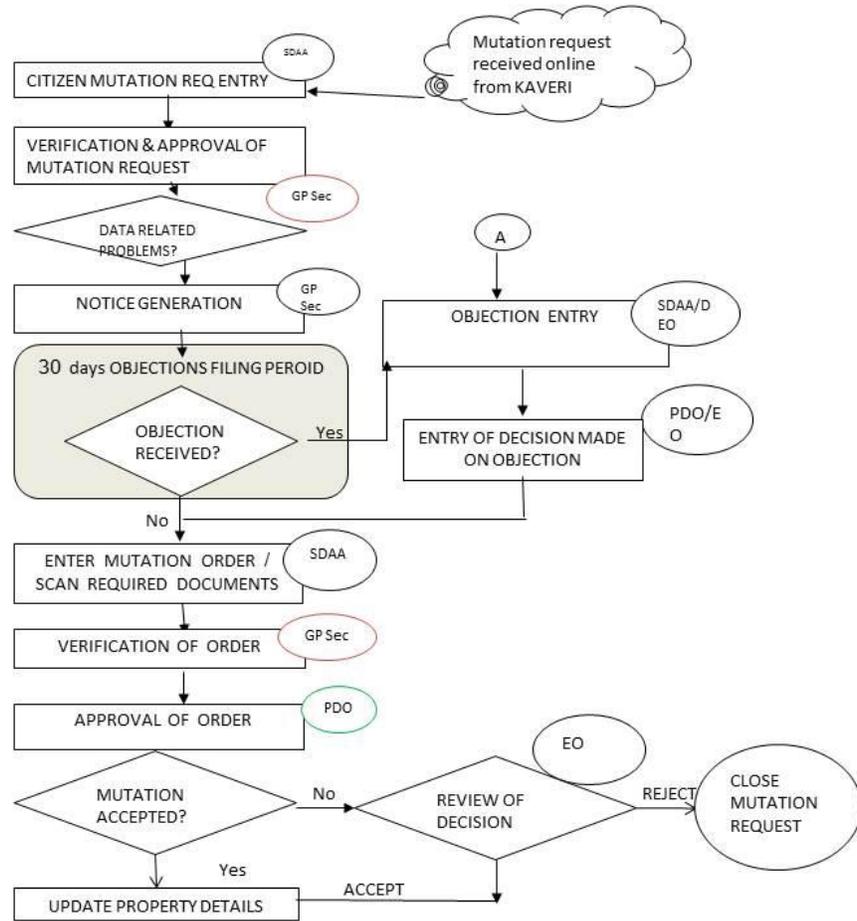


Fig 4.0

6.4 Electronic integration of e-SWATHU with KAVERI (Registration process)

Any e-Governance system can monitor the activities only after transactions / process data are digitally captured on them. Even If e-Governance systems are in place and its interfaces are exchanging data in the form of paper with other stakeholders, actual benefit cannot be exploited. When orders in the form of papers are exchanged, individuals working on software popularly called as System/Screen level bureaucrats (Data entry operators / officials in lower hierarchy of government) will only decide timing of the transaction giving undesirable discretionary power to these officials as to when to start the transaction, even if the target system is electronic in nature. Automatic initiation of transaction soon after receipt of electronic data will come handy in such scenarios apart from making monitoring easy. Keeping this in view, it was decided to adopt IT solution to stop illegal transactions. e-SWATHU and KAVERI (Registration module) have been electronically integrated so that no fraudulent papers are used for registration.

The greatest challenge in accepting manual papers in any type transaction is verification and validation. In the manual system which was existent before e-SWATHU, there was no way by which sub registrar would have verified the document before performing registration. As mentioned in earlier sections, they used to send documents for verification after the registration event which was of not much use. There were instances where documents were faked to change name of the owner after taking document from Grama Panchayat. There were cases where multiple registrations were reported on same piece of land by same owner. In an attempt to put an end to all these problems, Rural Development & Panchayat Raj, Department of Stamps and Registration and National Informatics centre decided to develop software modules to achieve electronic integration between e-SWATHU and KAVERI with following objectives:

- To bring synchronization between KAVERI and e-SWATHU by reducing time lag between registration and initiation of mutation process.
- To avoid duplication of data entry work that is being done at KAVERI and e-SWATHU resulting in reduction of workload.
- To reduce or remove the data entry mistakes resulting in rejection of J-slips.
- To reduce rejection of mutations in e-SWATHU due to wrong data entry even though XML is correct.
- To fill the vacuum of non availability of vital information during registration.
- To ensure that seller is the owner of the property.
- To ensure that transactions are allowed only on the available extents of the owners.
- To check various conditions of land grant before registration.
- To stop transactions on Government lands.
- To stop bifurcation of properties during registration without approvals from competent authority notified by Town and country planning department.

This step of electronic integration was a major process re-engineering to verify the authenticity of documents produced before registration and automatically generate the transaction using detailed XML of j-slip data without any human discretion.

6.5 Electronic Integration of e-SWATHU with e-VINYASA (Layout approval process of LPAs / UDAs)

As discussed in section 8.1 above, one of category of properties for which Form-9s are issued is properties created after due process of town and country planning approval. In this category, it has been decided to insist for the documents such as 1) Conversion order for changing the land use from agricultural non-agricultural (residential / industrial / commercial etc.,) 2) Layout approval order 3) Layout plan 4) Release order for releasing sites for transaction. All these documents which prove that property in question is indeed legally created property after following due course of law.

Department of Urban Development, Government of Karnataka has computerised layout approval process in the BMRDA (Bengaluru Metropolitan Region Development Authority) jurisdiction under project called e-VINYASA and digital store of all layouts along with reference documents are being created for both old layouts and for ongoing ones. Government of Karnataka has banned manual layout approvals through government order in the BMRDA jurisdiction. Since digital store of all documents pertaining to layout approval process like conversion orders, layout approval orders, layout plans and release orders are available in the form of scanned images / digitally signed documents, they can be easily fetch from the database.

While generating Form-9 for approved layout, Grama Panchayats have been asked to verify the conversion order, layout approval order, layout plan and release order before creating Form-9. Panchayat officers have to verify the authenticity of the documents before accepting them, there are no mechanisms to verify paper documents except trusting them based on seal and signature of the issuing authority which can be easily faked. Further Panchayat Development Officers were being asked to scan and store these documents mentioned above for future reference. In the process of verification and validation of documents issued by the Local Planning / Urban Development authorities, there were fair chances of fraudulent documents being accepted intentionally or unintentionally to create property records through e-SWATHU. In an attempt to put an end to all these problems, Rural Development & Panchayat Raj and National Informatics centre decided to develop software modules to achieve electronic integration between e-SWATHU and e-VINYASA with following objectives:

- To fill the vacuum of non availability of vital information during creation of property documents in Grama Panchayats.
- To ensure that properties are not created based on fraudulent documents.
- To avoid duplication of work such as scanning of supporting documents, conversion orders, layout approval orders, layout plans and release orders.
- To ensure that proper scanned documents are assigned to the properties.

This step of electronic integration was an another important process re-engineering activity to verify the authenticity of documents produced before Grama Panchayat officials before generation of property documents and to avoid duplication of scanning work. Further this electronic integration also ensured that right documents are stored against the properties for future reference.

6.6 Services offered as result of process re-engineering

RD & PR Department decided to issue various documents in addition to earlier documents which were being issued due benefits reaped as a result of process re-engineering activities. After process re-engineering and implementation of e-SWATHU project, following services are being provided to citizen:

- Issue of Form-9 (property ownership document) across the counter
- Issue of Form-11A (issued along with Form-9 indicating taxation details)
- Issue of form-11B (issued for illegally created properties before cut of date and maintained for taxation purpose)
- Form-9A extract (Form-9A register is super set of Form-9, Form-11A and Form-11B)
- Mutation of properties due to sale, inheritance, gift, will, partition, relinquishment, add or remove rights / liabilities etc.,
- Facility for sub division of sites
- Facility for amalgamation of sites
- Facility to view property record on web, based on property id or location details or document id.
- Facility to know whether property can be registered or not
- Facility to know the status of registration through interactive SMS

7. Strategy Adopted

7.1 Details of base line study done.

As indicated in earlier section, whole idea of having property records management system in Grama Panchayats which was different from demand register maintained for collection of tax was initiated to bring about ornerliness in property record management. National Informatics Centre was assigned with job of performing baseline study by Rural Development and Panchayat Raj department and submit the report. Study was carried out in few Grama Panchayats in Bangalore Urban district and Bangalore rural district. Names of the Grama Panchayats where study was done are Bashedtahalli GP in Doddaballapur taluk, Anneshwara GP in Devanahalli Taluk, Basavanahalli GP in Nelamangala taluk, Dasanapura GP in Bangalore (North) taluk. Further series of meetings were held with selected Executive officers of Taluk Panchayats, Panchayat Development Officers of Grama Panchayats, Grama Panchayat Secretaries to understand the system and to propose the solution.

A detailed Software Requirement Specification (SRS) Document was submitted to Secretary to the Government, Government of Karnataka, Rural Development and Panchayat Raj (PR). There were series of brain storming discussions on SRS which had proposed new format for maintenance of property details and process to be followed while generating new documents and synchronization of new data with already existing database called Panchatantra. SRS was approved by Secretary to Government of Karnataka, Rural Development Department (PR) and amendment to ***Karnataka Panchayat Raj act (Budget and Accounts Rules), 2006*** was initiated and National Informatics Centre was given approval to develop **e-SWATHU** software to manage property records in Grama Panchayat jurisdiction.

7.2 Problems identified

During Baseline study it was noticed that there was no well defined processes to take property into demand register. All illegally created properties were included into the demand register and the extracts of demand registers were being used to transact the properties. There was no data pertaining to whether property that is being added to demand register is a legally created one or illegally created property. All properties were given same status in the demand register as primary objective was to collect tax. Demand Register extracts used in the sub register office for performing transaction were different from what was prescribed in the ***Karnataka Panchayat Raj act (Budget and Accounts Rules), 2006***. There were instances wherein fake demand register extract required to complete the registration formality were created by middlemen in sub registrar's office itself. It was astonishing to note that demand register copies which were not prescribed under ***Karnataka Panchayat Raj act (Budget and Accounts Rules), 2006*** were being issued from Grama Panchayats without maintaining any issue register. All these activities had resulted in mushrooming of illegal layouts in peri-urban areas.

7.3 Roll out/implementation model

Implementation model selected for e-SWATHU is incremental, that is as and when citizen approaches the office for FORM-9 / Form-11B, he / she will be asked to furnish the relevant documents to classify whether it is a legally created property (Form-9) or illegally created property (Form-11B) and other documents such as photo of the property, photo of owner, owner identification documents are scanned and uploaded. Since all the documents required for generating property documents (Form-9 / Form-11B) are not with Grama Panchayat, citizen has to provide them. Government has issued government orders banning manual copies of Form-9 / Form-11B on 14-06-2014. All the accepting authorities have been instructed to accept only computerized and digitally signed Form-9 / Form-11b which are outputs of e-SWATHU.

The decision to adopt incremental approach to create property records on demand was an intelligent decision taken by government which removed initial huge data entry for creating records and also reduced pressure on the Grama Panchayat officials.

Since Rural Development & Panchayat Raj department had already initiated many e-Governance applications at Grama Panchayat level and National Informatics Centre had rich experience in handling large e-Governance projects like BHOOMI, it was decided to implement the project all across the state simultaneously. No pilots were tried and project was rolled out successfully all across the state and is running successfully since 14-06-2014.

7.4 Communication and dissemination strategy and approach used

Every Grama Panchayat has computers and internet access using broad band connection / data card dongle. Wherever connectivity is not available in Grama Panchayat head quarters, arrangements have been made to setup centres in one of the villages under Grama Panchayat jurisdiction to provide services. e-Mail ids have been created for all the field level officers and all instructions are being passed on to them through e-Mail. Letters and circulars are being uploaded into department's website regularly for the convenience of the department hierarchy. SMS integration through e-SWATHU application has also helped in broadcasting small message to the department hierarchy through CUG phones. Project objectives and implementation support is also being provided to field level officials through series of district level meetings attended by RD & PR officers and NIC officers. Video conference sessions are being held regularly to inform about new developments and enhancements made in the software.

Unique feature in implementation support is monthly program of "SAMVADA" (Discussion) through SATCOM program where senior departmental officials in the leadership of Additional Chief Secretary and Secretary panchayat Raj will be discussing with officials of all Grama Panchayats, Taluk Panchayats and Zilla Panchayats, with respect to different schemes. There would be an exclusive session on e-SWATHU in the 'SAMVADA' where NIC officers and department officers exchange the information with field hierarchy and answer questions raised by them for smooth implementation of the project.

8. Technology Platform used

8.1 Description

e-SWATHU software has been designed and developed by National Informatics Centre, Karnataka State Unit to manage property records in the jurisdiction of Grama Panchayats. e-SWATHU is a multi-tier web architecture wherein the presentation, application business, and data layers are separate but interoperable, allowing for a high degree of scalability, maintainability, and customization. Web forms using dynamically populated controls make up the presentation tier and handle the display and management of data for the user. Web site is hosted in NIC Data centre, Bangalore which is secured environment:

- Front end forms are developed using ASP.net with c# as scripting language using framework version 4.0
- SOAP Web services to exchange data between different applications like Panchantantra, KAVERI (Registration system), e-VINYASA (Layout & Apartment approval system).
- Backend database is SQL Server 2008
- SQL Server 2008 Reporting services for dashboard.
- Biometrics finger print authentication for non-repudiation.

- PKI (Public Key Infrastructure) for making documents issued from e-SWATHU as evidence in court of law as per IT Act 2000.
- Local language interface using Unicode.
- SMS integration to get status and details of transaction.
- Mobile App on android to check ownership details and registerability (whether property can be registered or not in Sub registrar office for property transfer) of the property.

8.2 Interoperability

e-SWATHU software works very well on browsers which support active-X components. Biometrics integration for authentication and Digital Signature integration (PKI) in e-SWATHU uses active-X components. While software works without any issues on all Internet Explorer versions 8 and above, it gives problems on java based browsers like Chrome, Opera, Firefox etc., If Java based applets are developed then Internet Explorer doesn't support them. Since e-SWATHU is a closed group application and all Grama Panchayats are working on windows machines this limitation has no effect on successful implementation of the software. As far as citizen access is concerned they can use the web site on any browser for viewing of records, finding the status of a request, checking whether property can be registered or not, verifying the authenticity of the documents as these facilities are supported on all browsers.

8.3 Security Concerns

All application security measures are taken while developing the application. e-SWATHU software takes care of following vulnerabilities and same has been cleared by security audit done through APPSCAN (Tool under IBM Rational suite) and manual security audit done by data centre team:

- SQL injection
- Cross site scripting (XSS)
- Brute Force
- Content Spoofing
- Buffer Overflow
- XPath Injection
- Cross-site Request Forgery
- The log of users logged in with his username, date and time of login and IP address is captured along with user logouts and logout time.
- In case of unsuccessful login access, the details of username tried, date and time of the attempt and IP address of the user is captured for further analysis.
- Password policy is put in place with password length of at least 8 characters and combination of characters (alphanumeric with special characters).
- User will be forced to change the password at first login as per his choice of password.
- All the password changes are recorded in the separate log table with username, IP address used and date and time of change done.

- User is alerted and forced to change the password at fixed intervals 45 days.
- User will not be allowed to use the last 9-10 old passwords

Network Security is taken care by NIC data centre in Bangalore as e-SWATHU has been hosted there.

8.4 Any issue with the technology

As defined in the section 8.2, active-X components don't work on java based browsers and java applets are not supported well in internet explorer. Efforts are on to resolve the issue either through technical solution or by providing alternate build of the software. In case of alternate build, without affecting the user experience requests will be routed to respective builds depending on the browser from where request has originated.

8.5 Service level Agreements(SLAs)

No service level agreements as owner of the project and technical partner are government departments; however topmost care has been taken to provide interrupt free service to departmental official and also to the citizen with minimum response time.

9. Citizen Centricity

Section 3 of this document has listed objectives of the e-SWATHU project and section 6.6 has listed services provided to the citizen. It is clear from the objectives that Rural Development & Panchayat Raj department, Government of Karnataka wanted to put in place the system which is citizen centric and enables easy access to the citizen for records in Grama Panchayats. As a result e-SWATHU facilitates:

- Up-to-date records with respect to ownership, extent, dimension, etc., of properties under the jurisdiction of Grama Panchayats are available to citizen across the counter on payment of user charges fixed by Grama Panchayat (roughly Rs. 50/-).
- Online mutation system has been put in place to undertake updations due to various transactions such as sale, inheritance, partition, gift, will, land acquisition, etc.,
- Citizen can view his / her record on web either by providing property id, location details or document number.
- Citizen can know status of his / her request with respect to generating new property record / mutation by providing application id / property id.
- Facility to know whether property can be registered or not is also provided through web site so that citizen need not visit Grama Panchayat / Sub Registrar office.
- Facility to verify the genuineness of the document has been made available so that citizen / any stakeholder can verify and confirm the authenticity.
- SMS integration for receiving information on approvals of mutation, generation of new properties if citizen has provided mobile number while requesting the service.

- Mobile App on android to check ownership details and registerability (whether property can be registered or not in Sub registrar office for property transfer) of the property.

9.1 Impact on effort, time and cost incurred by user

Users of the e-SWATHU have great advantage in terms of efforts they were putting to get their property records, Time taken and cost. e-SWATHU has ensured that property records in the form of Form-9 / Form-11A/ Form-11B are accessed effortlessly by every owner of the property both from Grama Panchayat office and on web. While physical copies are available in Grama panchayat across the counter within few minutes, digital copies can be viewed on web instantaneously. Since documents are available in Grama Panchayat office itself there is no additional cost in terms of opportunity cost and transportation cost. Citizen need to pay only user charges as prescribed by Grama Panchayat which is about Rs. 50/-.

9.2 Feedback/grievance redressal mechanism

Citizen / all stakeholders can send their feedback provided in the software itself. Feedback received with respect to technical issues will be addressed by NIC development team and administrative matters are being forwarded to Rural Development & Panchayat Raj department. All the contact details in terms of e-mail ids and phone numbers of Panchayat Development Officers are provided in website so that citizen can approach them in case of any difficulty.

9.3 Audit Trails

As part of design, care has been taken to keep audit trail of each and every activity performed on e-SWATHU software. Login ids and time stamp is captured and stored at every stage of workflow. History is maintained while updating the existing data on the e-SWATHU database as a result of mutation process.

9.4 Interactive platform for service delivery

A mobile application has been developed for interactive service delivery with respect to obtaining ownership information of a property or to check whether property can be registered or not in the sub registrar office. SMS facility has also been enabled to get the registration status of the property with respect to whether property can be registered or not in sub registrar office. This can be achieved by sending SMS in following format to 9731979899

REGSTATUS<space>18 digit property id

9.5 Stakeholder consultation

All the stakeholders are consulted while designing system and also while attempting enhancements. Citizen / citizen representatives and officials in the department were part of the consultation process during initial study period at Grama Panchayat level. Series of meetings were held with Department of Stamps and Registration for electronic integration of KAVERI (registration software) with e-SWATHU. Since NIC has designed and developed e-VINYASA (Layout approval software for Local Planning / Urban development authorities), brainstorming sessions were held with the e-VINYASA team for data exchange between e-SWATHU and e-VINYASA.

10. User convenience

10.1 Service delivery channels (Web, email, SMS etc.)

Web and SMS are effectively used for service delivery with following facilities

WEB:

- Citizen can view his / her record on web either by providing property id, location details or document number.
- Citizen can know status of his / her request with respect to generating new property record / mutation by providing application id / property id.
- Facility to know whether property can be registered or not is also provided through web site so that citizen need not visit Grama Panchayat / Sub Registrar office.
- Facility to verify the genuineness of the document has been made available so that citizen / any stakeholder can verify and confirm the authenticity.

SMS:

- SMS integration for receiving information on approvals of mutation, generation of new properties if citizen has provided mobile number while requesting the service.
- Interactive SMS to get registration status of a given property.

10.2 Completeness of information provided to the users,

Data stored in e-SWATHU is created using workflow based application with different users having roles such as data entry role, verification role and approval role. Approving authority i.e., Panchayat Development Officer approves the transaction using his / her digital signature. Hence, accountability and non-repudiation is taken care by enabling the application with biometric finger print authentication. Supporting documents in terms of scanned images are being insisted upon during data capture stage and facility has been provided to all levels viz., Grama panchayat, Taluk Panchayat, Zilla Panchayat, and Directorate to verify the documents scanned for approving the property. With all these checks in place, one can presume that data is complete and correct.

10.3 Accessibility (Time Window)

Web site is accessible 24 X 7, citizen can avail service in Grama Panchayat office during office hours as far as obtaining the copies of documents and giving requests are concerned. Viewing documents / checking the status / verifying whether document can be registered or not is available 24 X 7 through web site and SMS service.

10.4 Distance required to travel to Access Points

Citizen may have to travel about 0 – 3.5 Kms for reaching grama panchayat office.

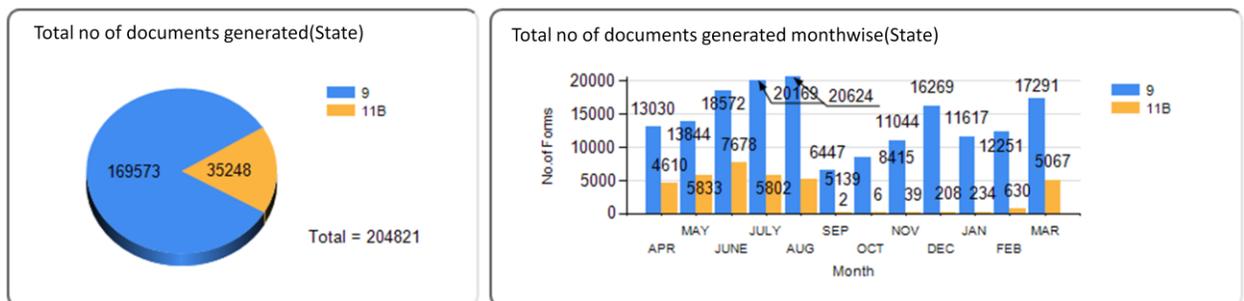
10.5 Status tracking

Facility has been provided in the web site to check the status of the request to create Form-9 / Form-11B and mutation.

11. Efficiency Enhancement

11.1 Volume of transactions processed

Following table shows number transactions handled from inception of e-SWATHU on 14-06-2013



e-SWATHU - A Property Management System For Panchayats

Report on Form-9 / Form-11A / Form-11B approved

Sl No	District Name	Form - 9						Form - 11B
		Grama Thana Sites	Approved layout sites	Sites distributed through Government schemes	Sites approved for industrial purpose	Farm House / Building	Total	
1	BAGALKOTE	707	4605	183	60	0	5555	20
2	BANGALORE	188	34306	1206	86	0	35786	11568
3	BANGALORE RURAL	194	8200	550	48	0	8992	3592
4	BELGAUM	1212	2584	87	9	0	3892	273
5	BELLARY	816	1665	112	21	0	2614	1512
6	BIDAR	131	385	135	0	2	653	111
7	BIJAPUR	53	2246	77	0	0	2376	0
8	CHAMARAJA NAGARA	297	660	5	2	0	964	6
9	CHIKMAGAL UR	1237	1235	931	11	0	3414	227
10	CHITRADUR GA	1746	5118	51	5	0	6920	513
11	DAKSHINA KANNADA	349	7425	509	2	0	8285	1589
12	DAVANAGER E	814	1105	144	2	0	2065	161
13	DHARWAR	175	262	83	1	0	521	0
14	GADAG	179	1055	60	6	0	1300	1
15	GULBARGA	173	3144	89	2	0	3408	1667
16	HASSAN	1468	4208	402	11	1	6090	284
17	HAVERI	406	460	17	4	0	887	43
18	KODAGU	8	827	9	5	0	849	311
19	KOLAR	1197	6139	24	38	0	7398	1377
20	KOPPAL	372	7291	361	17	0	8041	85
21	MANDYA	3758	859	468	17	2	5104	232
22	MYSORE	1714	7251	594	107	0	9666	2929
23	RAICHUR	171	3037	45	3	0	3256	855
24	SHIMOGA	1261	2792	1077	10	0	5140	319
25	TUMKUR	580	4162	412	27	0	5181	3067
26	UDUPI	9	6337	620	7	0	6973	359
27	UTTARA KANNADA	13	556	105	30	0	704	321
28	CHIKKABAL LAPURA	998	10213	347	12	0	11570	466
29	RAMANAGA RA	1898	5252	265	64	0	7479	1905
30	YADGIR	833	2021	6	6	0	2866	25
	Total:	22957	135400	8974	613	5	167949	33818

e-SWATHU - A Property Management System For Panchayats

Report on number of documents issued to citizen and user charges collected

SlNo	District Name	Form-9			Form-11A			Form-11B			Total
		Printed	Amount	Total Amount	Printed	Amount	Total Amount	Printed	Amount	Total Amount	
1	BAGALKOTE	7185	359250.00	359250.00	5568	278400.00	278400.00	24	1200.00	1200.00	638850.00
2	BANGALORE	44841	2242050.00	2242050.00	42420	2121000.00	2121000.00	13511	675550.00	675550.00	5038600.00
3	BANGALORE RURAL	11310	578900.00	578900.00	11024	563550.00	563550.00	4196	238100.00	238100.00	1380550.00
4	BELGAUM	5047	252350.00	252350.00	4258	212900.00	212900.00	408	20400.00	20400.00	485650.00
5	BELLARY	3122	156100.00	156100.00	2858	142900.00	142900.00	2211	110550.00	110550.00	409550.00
6	BIDAR	870	43500.00	43500.00	740	37000.00	37000.00	130	6500.00	6500.00	87000.00
7	BIJAPUR	3067	153350.00	153350.00	2271	113550.00	113550.00	0	0.00	0.00	266900.00
8	CHAMARAJA NAGARA	1215	61150.00	61150.00	1266	60600.00	60600.00	13	650.00	650.00	122400.00
9	CHIKMAGALUR	4966	248300.00	248300.00	4146	207300.00	207300.00	348	17400.00	17400.00	473000.00
10	CHITRADURGA	8905	546200.00	546200.00	8601	521750.00	521750.00	664	73150.00	73150.00	1141100.00
11	DAKSHINA KANNADA	10869	543450.00	543450.00	10343	517150.00	517150.00	1811	90550.00	90550.00	1151150.00
12	DAVANAGERE	2623	132100.00	132100.00	2263	114000.00	114000.00	192	9600.00	9600.00	255700.00
13	DHARWAR	768	38400.00	38400.00	513	25650.00	25650.00	1	50.00	50.00	64100.00
14	GADAG	1625	81250.00	81250.00	1513	75650.00	75650.00	9	450.00	450.00	157350.00
15	GULBARGA	4063	612000.00	612000.00	3869	458000.00	458000.00	2095	355950.00	355950.00	1425950.00
16	HASSAN	8207	410350.00	410350.00	7622	381100.00	381100.00	356	17800.00	17800.00	809250.00
17	HAVERI	1636	81800.00	81800.00	1279	63950.00	63950.00	96	4800.00	4800.00	150550.00
18	KODAGU	1035	51750.00	51750.00	1034	51700.00	51700.00	371	18550.00	18550.00	122000.00
19	KOLAR	10340	517000.00	517000.00	9891	494550.00	494550.00	1876	93800.00	93800.00	1105350.00
20	KOPPAL	10144	507200.00	507200.00	9400	470000.00	470000.00	115	5750.00	5750.00	982950.00
21	MANDYA	6571	370800.00	370800.00	6090	344800.00	344800.00	343	19000.00	19000.00	734600.00
22	MYSORE	12124	634500.00	634500.00	11630	607150.00	607150.00	3721	198750.00	198750.00	1440400.00
23	RAICHUR	3876	232300.00	232300.00	3804	220800.00	220800.00	1012	66250.00	66250.00	519350.00
24	SHIMOGA	6786	339300.00	339300.00	6513	325650.00	325650.00	453	22650.00	22650.00	687600.00
25	TUMKUR	6646	332300.00	332300.00	6383	319150.00	319150.00	4073	203650.00	203650.00	855100.00
26	UDUPI	9562	478100.00	478100.00	8889	444450.00	444450.00	612	30600.00	30600.00	953150.00
27	UTTARA KANNADA	842	42100.00	42100.00	653	32650.00	32650.00	424	21200.00	21200.00	95950.00
28	CHIKKABALLAPURA	14468	753700.00	753700.00	14045	729400.00	729400.00	595	30250.00	30250.00	1513350.00
29	RAMANAGARA	10028	504150.00	504150.00	10511	528050.00	528050.00	2417	120950.00	120950.00	1153150.00
30	YADGIR	3419	313650.00	313650.00	3315	306100.00	306100.00	39	1950.00	1950.00	621700.00
	Total:	216160	11617350.00	11617350.00	202712	10768900.00	10768900.00	42116	2456050.00	2456050.00	24842300.00

11.2 Coping with transaction volume growth

NIC data centre is handling the transaction volume effectively and efficiently, since model selected is incremental in nature and generation of property documents are being done based on the demand and on an average about 30,000 documents are being approved and transaction volume is increasing with time. About 1500 mutations are being handled with respect 2,00,00 properties created on e-SWATHU.

11.3 Time taken to process transactions,

Following tables shows time taken to generate Form-9 / Form-11 / Form-11B

Sl.No	District Name	Average number of days
1.	BAGALKOTE	22
2.	BANGALORE	20
3.	BANGALORE RURAL	14
4.	BELGAUM	8
5.	BELLARY	15
6.	BIDAR	5
7.	BIJAPUR	29
8.	CHAMARAJA NAGARA	5
9.	CHIKMAGALUR	11
10.	CHITRADURGA	16
11.	DAKSHINA KANNADA	4
12.	DAVANAGERE	10
13.	DHARWAR	15
14.	GADAG	8
15.	GULBARGA	6
16.	HASSAN	16
17.	HAVERI	9
18.	KODAGU	2
19.	KOLAR	20
20.	KOPPAL	12
21.	MANDYA	7
22.	MYSORE	15
23.	RAICHUR	7
24.	SHIMOGA	14
25.	TUMKUR	20
26.	UDUPI	3
27.	UTTARA KANNADA	5
28.	CHIKKABALLAPURA	17
29.	RAMANAGARA	20
30.	YADGIR	5
	Average for state	12

11.4 Accuracy of output,

Since multiple levels of verification are in place and accountability is fixed, accuracy in output is achieved.

11.5 Number of delays in service delivery

No such events have been reported.

12 Cost effectiveness

Since service is available in Grama Panchayat office which is within the 0-3.5 KMs distance, there is no transportation cost or opportunity cost involved and citizen has to pay only service charges. As far as infrastructure is concerned, existing computers, peripherals and connectivity is being used for the project. This is cost effective solution to the citizen as he can view his documents on web and demand for the same in Grama panchayat. There is no scope for repeated visits as status of the request can be tracked through web site.

13 Capacity Building and Organizational Sustainability

Series of training programs have been conducted to field level staff, MIS co-ordinators of district and taluks, District project Managers, District Informatics Officers of NIC etc., Number of Video conferencing sessions are also held to educate the officers. Master trainers program is regularly being conducted by ANSSIRD (Abul Nazeer Shab State Institute for rural Development). SATCOM programs are being conducted every month to address the problems of field level officials.

14 Accountability

As discussed earlier this has been taken care using bio metric authentication and digital signature integration (PKI). Audit logs are also maintained to fix the accountability.

15 Innovation

e-SWATHU is a wonderful example of creation of digital property records from scratch without involving survey activities. Once property database is ready, one can always use satellite imagery to identify them on the ground and use concept of indicative cadastre without mentioning dimension. Most of the illegal transactions pertaining to properties under the jurisdiction of Village Panchayats have been stopped after inception of e-SWATHU system. Incremental approach of creating property records on demand has also reduced pressure on the Village Panchayat officials. Citizen has been empowered by providing access to his / her property records on web, either too it was not possible before e-SWATHU.

16 Appropriate Delegation

Workflow based approach with clear cut roles and responsibilities for each of the users in the workflow ensure that appropriate delegation of powers is taken care as per the act.

17 Result Achieved/ Value Delivered

17.4 To Organization

- Better management of property records under their jurisdiction.
- Complete elimination of illegal properties getting into records.
- Good-bye to fake documents.
- Accountability ensured for department officials.
- Reduction in property disputes.

17.5 To Citizen

- Across the counter service for getting documents.
- Requests are acknowledged and can be tracked.
- Easy access to their records through web interface
- SMS service to know status of request and interactive SMS service for finding out status of registerability.
- Elimination fake documents ensure buyers are not cheated.
- Easy access to loan due to authenticity of the document.

17.6 Other Stakeholders

- Registration department is provided with all information about the property at the time of registration so that verification of documents is not a challenge anymore.
- Impersonation during registration is completely avoided as property documents are issued with photo of the owner printed in property document.
- Banks and Financial institutions can advance comfortably as legally created properties and illegally created properties can be clearly distinguished easily.
- All the accepting authorities can verify the document on web and also can depend on paper document to large extent as documents are issued on secured paper with hologram and every document is digitally signed and bar coded.

18 Extent to which the Objective of the Project is fulfilled

e-SWATHU is not only G2C but it is also G2G application. As discussed in earlier section citizens have been empowered with easy access to their property records within the jurisdiction of Grama Panchayat, it has removed uncertainty with respect to obtaining copies of the document. A well-defined workflow based system enables easy tracking of requests and to know the status. Reports shown in earlier section clearly demonstrates that more than two lakh records have been created in past one year of implementation and more than 2 crore of rupees are collected as user charges.

Benefits of e-SWATHU to other stakeholders such as banks, courts, registration department etc., prove that e-SWATHU is also a G2G application.

19 Adaptability Analysis

19.1 Measures to ensure adaptability and scalability

User friendliness built into e-SWATHU software ensures its adaptability. The fact that e-SWATHU was rolled out all across that state in a single instance and working successfully in all 5629 Grama Panchayats is proof of its adaptability. Configurable workflow built into the system helps in adapting the system in any setup. Scalability with respect to rollout was not at all a challenge as same is deployed all across the state. Scalability with respect to enhancements and handling transaction volume has also been ensured. Same is evident from the reports shown in the earlier section.

19.2 Measures to ensure replicability

Data that is being captured in e-SWATHU with respect to properties have been decided carefully while amending law so that only generic information specific to property and owner is captured. Parameters are common to all non-agricultural properties irrespective of region. Form-9A register which is superset of all the documents issued (Form-9 / Form-11A / Form-11B) is exhaustive and suitable all across the state / country. Unicode enabled system ensures that software can be easily customized to any language with little effort.

19.3 Restrictions, if any, in replication and or scalability

There are no known restrictions.

19.4 Risk Analysis

- Risk of non-repudiation is ensured through biometric finger print authentication.
- Risk of data integrity is ensured through PKI (Public Key Infrastructure).
- Risk of data loss is ensured through regular backups in the data centre.
- Risk of security threats are ensured through security audit through automated tools like APPSCAN and manual security audit by data centre experts.
- Risks of creating fake documents are taken care by putting in place secured stationery with water mark and Holograms.

e-SWATHU - A Property Management System For Panchayats

20 Comparative Analysis of earlier Vs new system with respect to the BPR, Change Management, Outcome/benefit, change in legal system, rules and regulations

Sl.No	Activity	Earlier System	New System
1.	Process workflow	Not clear	Well-defined workflow in place for each and every activity
2.	Clarity with respect to legality of the property	Was no there	One can clearly make out whether property is legally created or not
3.	Mutation process	No well-defined process and standard procedure	Common well-defined procedure all across the state
4.	Scope for fake documents	Lot of scope as documents were manual	No scope as documents printed on secured stationery with hologram which is digitally signed and bar coded.
5.	Legal sanction as property record	Only used as demand register extract	With required amendments to act they have become property records.
6.	Outcome / benefit	Access to records were difficult	Easy access to records
7.	Accountability	No accountability for issuing documents or using them for registration	Accountability completely ensured
8.	Rules / regulations	Lack of clarity	Lot of clarify after BPR & amendments to act and rules
9.	Change Management	Not applicable	Ensured through series of training and capacity building programs
10.	Outcome of BPR	No record about time taken for adding new property to tax net.	Average time taken to generate and add property to tax net and property database is 12 days. District wise report is shown in section 11.3 which is well within the 40 days prescribed under and GSC ACT(Guarantee Services to Citizen Act).