



INFORMATION KERALA MISSION
A-23, Jawahar Nagar, Thiruvananthapuram

BEST PRACTICES FOR CAPTURING LEGACY SYSTEMS: A CASE STUDY OF CIVIL REGISTRATION COMPUTERISATION

CONTENTS

1.	Introduction	3
2.	Backdrop	4
3.	Issues involved	4
4.	Best practices	5
	I. Standardisation for improved data quality and improved search options	5
	II. Creation of a framework for pre-processing, data entry and verification.....	6
	III. Random sampling of output and assessment of quality of final output.....	7
	IV. Archiving of past data and indexing of scanned manuscripts.....	10
	V. Quality control for day to day counter operations	10
	VI. Data audit process for detecting fraudulent practices.....	10
	VII. Capturing data at source for control over input data quality	11
	VIII. Wiping out backlog in issue of certificates under Section 12 of the Registration of Births and Deaths Act	11
	IX. Linking up the Civil Registration process with citizenship registration.....	12
5.	Conclusion	12

Introduction

Kerala's attempts in democratic decentralisation have got international acclaim. It is not just the unconventional methodology adopted for decentralisation that attracted word wide attention. The People's Plan campaign that ensured active grassroots level participation as well as the endeavour in administrative reforms aimed at empowerment of the masses at large have contributed to it. The decentralisation project initiated as a sequel to the 73rd and 74th constitutional amendments of 1992 is at the phase of institutionalisation at present. Attempts to make local self-government institutions (LSGIs) more efficient and responsible have gained crucial importance in this context. A separate mission group, the Information Kerala Mission was established to spearhead the application of Information Communication Technologies for improving the overall performance of LSGIs in the state. Among the various aspects of e-governance and business process re-engineering strategies adopted by the mission, the approach in capturing legacy information has been a very important one.

Computerisation of civil registration and certification taken up by IKM involved extensive compilation of manuscript records of past registration primarily because public service is based on providing extracts from the archive. The civil registration system handles essential statutory documents relating to citizenship, nationality, age, name, parentage, place of birth, heir ship rights, rights for re-marriage, alimony etc and is a very important service for the common man. Improving efficiency and transparency of civil registration system has been identified as a priority area for computerisation by LSGIs.

Civil registration and the vital statistics based on it, as they form the most comprehensive and extensive database on the demographic parameters of a country, assume significance from a community database point of view also.

They are useful in community health management, protection of human rights and inheritance, population control programmes, demographic studies etc. Geographic distribution of vital statistics and indices based on them are critical sources of data for planning national level programmes.

1. Backdrop

Information Kerala Mission (IKM) established in June 1999 started its software development based on the intensive system study conducted with extensive stakeholder participation. Computerisation of civil registrations was one of the earlier initiatives of IKM. An application for civil registration named *Sevana* application suite developed by IKM has the following modules.

- i. *Sevana* Past Data Entry module
- ii. *Sevana* Hospital Kiosk module
- iii. *Sevana* Local Body Kiosk module
- iv. *Sevana* District module
- v. *Sevana* Panchayat Directorate module

The application has been installed and is being used regularly in Vellanad Grama Panchayat in Thiruvananthapuram District as well as in four Corporations Kozhikode, Thrissur, Kochi, and Kollam where computerised public service counters called *Janasevanakendram* have been set up. This has significantly enhanced the effectiveness of civil registration in these LSGIs and has minimised the hardship in getting the certificates.

2. Issues involved

The past records on birth, death, and marriage registration involve manuscript versions of the information furnished by the public regarding birth death and marriage written down by the staff of LSGIs (The practice of transcribing the report and getting it authenticated by the informer has been discontinued of late and the new practice is to file the informant's report as it is). In spite of

being a traditional responsibility of LSGIs the book keeping practices in various offices show considerable variance with the procedures laid down in the Registration of Births and Deaths Act, 1969 (Central Act 18 of 1969), the Kerala Registration of Births and Deaths Rules, 1970 and the Kerala Registration of Births and Deaths Rules, 1999.

The main lapses in maintenance of the register include incomplete entries, wrong order in allocating registration numbers, wrong registration dates, overwriting of records and inadequate entry of remarks for special records involving delayed registrations, name corrections, name changes, name inclusions etc. Widely repeated particulars like place of birth, name of hospital or institution where birth/death happens are documented in a non-standardised manner creating difficulties in building up a database providing meaningful facilities for search. Extensive mistakes also occur in recording statistical information like occupation and educational qualifications of parents, type of pregnancy care, and cause of death.

3. Best practices

I. Standardisation for improved data quality and improved search options

The birth and death registers being statutory documents with well laid down procedures (though quite often not meticulously followed) devising a process for standardisation of data in searchable fields is a tricky issue. This would create a situation where the electronic database would have records that show some discrepancies with the manual register raising ambiguities in verification and authentication of the final database. This is circumvented by providing an option for recording the fields that are being standardised in the same form as recorded in the register as well as in the standardised form so that vagueness in verification and authentication of the database could be fully resolved. The standardisation involves fixing centralised standards for

most database fields like Names of Districts, Villages, Towns, Local Bodies, Classes of Occupation, Literacy levels, Religion, Nationality, Type of Pregnancy care, Gender, Marital status, Cause of death, Details of health care prior to death etc. However for certain fields like Name of Local Hospital or Local Institutions, Local Place Name, Place of Marriage etc., centralised standards are not feasible and so provision is made for local customisation. Validations are provided in the application to handle absurdities like registration date prior to date of birth and date of death, unacceptable values of age at marriage, age at conception, period of pregnancy, weight of baby at the time of birth, order of birth, and age at the time of death. The objectionable values are corrected through a process and details of rectifications noted with appropriate orders both in the electronic form and the manuscript.

II. Creation of a framework for pre-processing, data entry and verification

A framework is created through serial numbering of registers, pages in the registers and records in the pages to create a frame of reference for relating the electronic version with the manuscript unambiguously. The deficiencies in the registers like gaps in data, exceptions like remarks and discontinuities in registrations, name corrections, name changes, adoption, sex changes, multiple births, and illegitimate births are captured and revalidated during data entry. The number of records page wise, starting registration number and closing registration numbers in each page and register, starting registration and closing registration dates in each register etc are validated during data entry. Creation of the framework helps segregate the data in the register into several data blocks which prevents overflow of errors helping management of data entry, verification and correction substantially leading to stage wise process control and improved overall quality control.

III. Random sampling of output and assessment of quality of final output

After data entry, first level verification of data by the data entry operator, and verification by the LSGI staff, one percent random sample of the output data is drawn and an assessment of the data quality made while porting the database into the *Sevana* application during the commissioning of the public service. The errors identified through the study could be classified into three.

- a) Errors in character fields
- b) Errors in numeric fields
- c) Errors due to improper selection from the masters

Errors due to improper selection from the masters are further classified into the following.

- i. Type 1 errors: Blank records in electronic records whereas records are not blank in the original records (Blank for Non-Blank)
- ii. Type 2 errors: Non-blank records in electronic records whereas records are blank in the original records (Non-Blank for Blank)
- iii. Type 3 errors: Wrong information entered in electronic database where the original record is non-blank (Non-Blank 1 for Non-Blank 2)

If the percentage of error is greater than a threshold the database is not accepted for commissioning and a fresh cycle of data verification and quality check would be initiated.

The process adopted for creation and acceptance of electronic database is shown in figure 1. The process starts with pre-processing, which includes initial examination and numbering of records. This is followed by data entry of records. Incomplete and illegitimate records are then identified.

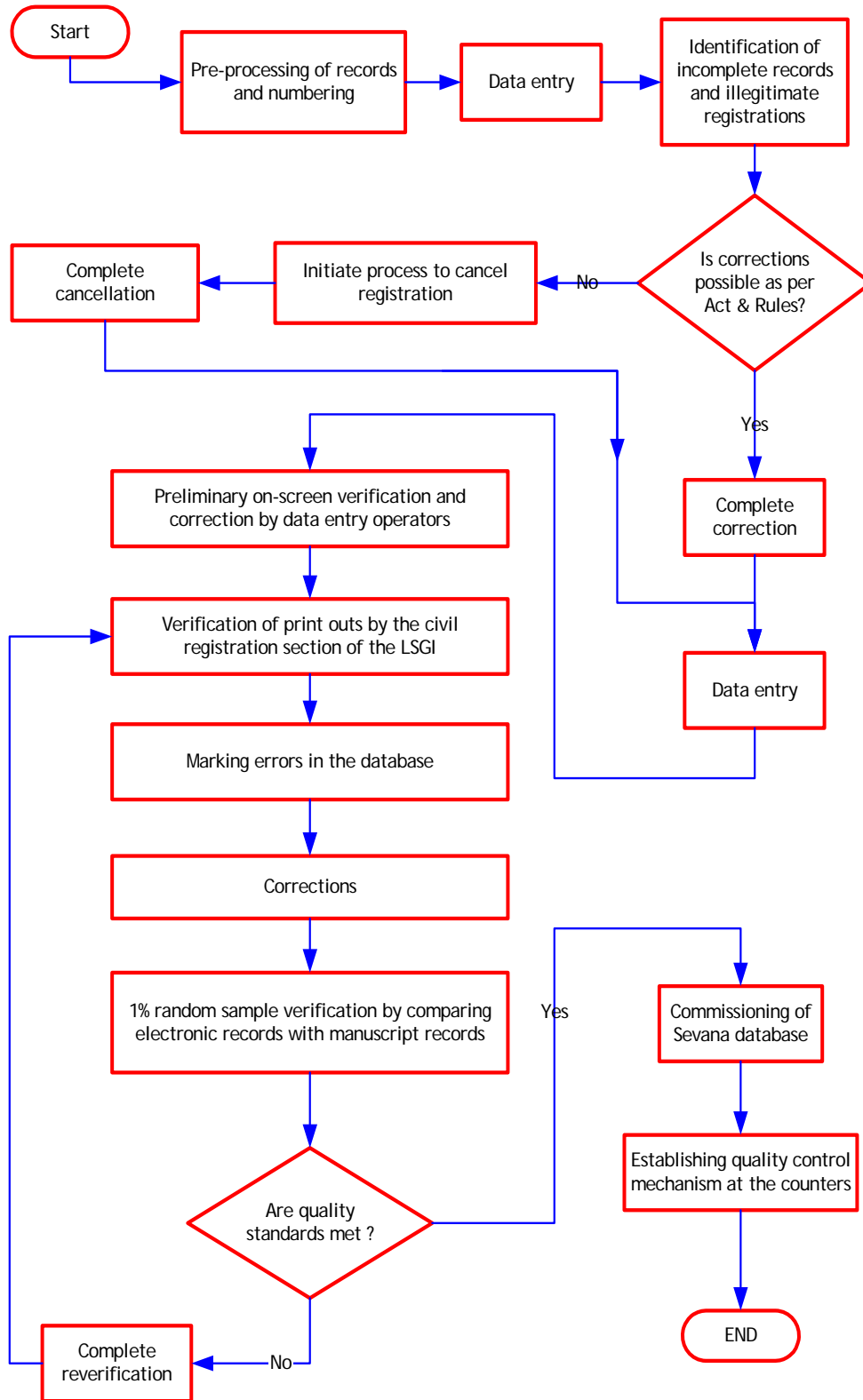


Figure 1: Process for Creation of Electronic Database

They are either corrected, if correction is possible within the provisions of Acts and Rules, or cancelled through laid-down procedure. These corrections are then made in the database. The data entry operators carry out a preliminary on-screen verification and correction of records.

This is followed by the detailed verification of printed out records by the staff of the civil registration section at the LSGI. Errors identified are marked in the database and corrections effected. The next stage is the verification of 1% a sample of records, by comparing electronic records with manuscript records.

Acceptance of the database depends on the criteria shown in Table 1.

Table 1
Criteria for acceptance of database based on 1% random sampling

No.	Category	Groups of certificate fields in the Register (C)	Groups of Non-certificate fields (NC)		Maximum error allowed in groups of certificate fields in percentage of total records verified	Maximum error allowed in groups of non-certificate fields in percentage of total records verified
			upto 1999	2000 onwards		
1	Birth Registration	8	15	7	0.25%	5%
2	Death Registration	8	11	8	0.25%	5%
3	Marriage Registration	24	-	-	0.25%	5%

For certificate fields, the maximum permissible error is 0.25% and for non-certificate fields, it is 5%. If the database meets the criteria for acceptance, it is commissioned. A mechanism for quality control at the counters is established along with this. If the database does not meet the criteria for acceptance, it is subjected to complete re-verification by the staff of the civil registrations section of the LSGI.

IV. Archiving of past data and indexing of scanned manuscripts

The legacy records kept at the LSGI office are scanned and maintained record wise as an image database in an archive with indexing.

Re-verification and electronic validation of the records is done together with the archiving, which would further enhance the reliability and quality of the *Sevana* database. The archiving would remove the pressure on preservation of registers and help us integrate the entire silo of information in the old records relating to civil registration fully with the electronic database.

V. Quality control for day to day counter operations

The new information that is added into the database after deployment of the application should be made completely error-free before data is ported into the database. This is necessary to maintain data quality. A clear set of instructions has to be drawn out regarding additions and corrections in the database after the deployment of *Sevana* application. It is also essential to ensure that these instructions are strictly followed. It would now be possible to fix responsibility for corrections and additions in the database. User controls would also be provided in a manner so that audit trail of corrections and additions can be used for fixing responsibilities clearly. Putting in place a concurrent quality control system at the counters is possible only through regular comparison of the electronic records with the original manuscript records. This needs to be done on a daily basis. Facility for sampling, verification and corrections is incorporated in the software as a process.

VI. Data audit process for detecting fraudulent practices

A data audit process to identify data security lapses and shortcomings in using the application shall be organised once every year. The study shall focus on a detailed examination of records in the *Sevana* database, which has undergone alterations after porting or after the previous data audit and identification of

process lapses if any in change management. The electronic records shall be compared with the manuscript form and discrepancies if any in data management recorded.

VII. Capturing data at source for control over input data quality

The primary purpose of database management is to minimise corrections in a database. The best way to minimise corrections is to validate the data at source itself. In the case of registrations that happen at institutions including hospitals, a possibility for doing this is to enter information into computers stationed in kiosks maintained at the respective locations straightaway so that errors are identified immediately and data can be validated by cross checking with the informer. This would also improve citizen service also substantially since certificates could be issued to the informer within 24 hours after registration. The data entry process is effectively decentralised and the processes carried out at the hospital kiosk as well as at the LSGI counter would be clearly focussed and streamlined. There would be a clear demarcation in services between the hospital kiosk and the LSGI counter with the hospital kiosk handling bulk of the fresh registrations and name inclusions, and the LSGI counter handling delayed registrations, special processes like name changes, corrections etc.

VIII. Wiping out backlog in issue of certificates under Section 12 of the Registration of Births and Deaths Act

The backlog in issue of certificates under section 12 is a critical bottleneck in streamlining the civil registration process and eliminating scope for favouritism, delay in public service and nepotism. A one-time campaign is initiated to clear the six-year backlog in the issue of birth certificates and death certificates.

IX. Linking up the Civil Registration process with citizenship registration

Linking civil registration system with a universal registration system involving a unique personal identification number for each citizen would help in drastically increasing the value of civil registration as well as vital statistics. In order to facilitate this the electoral number of the individual, ration card number of the family to which the citizen belongs, building number of the household to which the individual belongs and cadastral survey number of the land parcel which is occupied by the house are linked to the civil registration system to create a distinctive citizen identification number. This would remove all ambiguities in Civil Registration and ensure that the hitherto non-validated particulars like address, name and age also get validated.

4. Conclusion

Streamlining the civil registration system is extremely important in improving public services in LSGIs. Right now data from the civil registration system is not used for any statistical or planning process because the system has not stabilised and the data is of poor quality. Application of these best practices throughout the state could drastically transform the civil registration system in Kerala and establish its relevance in public health and demographic planning.