CHAPTER IV

INDUSTRIES AND INFORMATION TECHNOLOGY DEPARTMENT

Information System Audit of 'FRIENDS, an e-Governance initiative of Government of Kerala'

Highlights

'FRIENDS', a key mission mode e-Governance (G2C) initiative of Government of Kerala, is a joint venture of the Department of Information Technology (IT) and Local Self Government Institutions (LSGI). This was started as a pilot project (FRIENDS Janasevanakendram), a single window integrated remittance centre, to facilitate residents to pay their utility bills, tax and other dues to Government without any extra cost at Thiruvananthapuram district in the year 2000. It was rolled out to the remaining 13 districts of Kerala in the next year 2001. The deficiencies noticed in planning, system design, organisational and management controls are given below:

The application was developed without preparing User Requirement Specification (URS). Even though envisaged to be an automated system, non-adherence to database normalisation principles, poor system design and inadequate capturing of vital data necessitated manual intervention, which led to control failures and embezzlement of money.

(Paragraphs 4.9.1, 4.9.2 & 4.9.3)

There were persistent delays in remittance of money collected from the FRIENDS Centres to Bank. The accumulated amount of money kept out of public exchequer was ₹15.21 crore and ₹11 crore at Ernakulam and Kozhikode Centres respectively. The total accumulated amount of money out of public exchequer from all the Centres was ₹136.02 crore.

(Paragraphs 4.9.3.1, 4.9.3.2 & 4.9.3.3)

Non-constitution of IT steering committee led to design of the system without proper vision and focus. The application was not upgraded in line with the technological advancements in the external environment.

(Paragraph 4.10.1.1)

No norms were fixed for the time required for completing a transaction resulting in large variation in the number of transaction of bills by various Service Officers.

(Paragraph 4.10.3)

Absence of change control mechanism resulted in discrepancies in the system generated reports and erroneous debit of ₹10.74 lakh from FRIENDS accounts. Similarly, another change made in the application without test run resulted in variation as high as ₹1.82 crore in different system generated reports.

(Paragraph 4.10.5)

System could not achieve the goal of providing single window remittance centre to the public due to lack of timely managerial interventions and coordination with participating agencies.

(Paragraph 4.13)

4.1 Introduction

FRIENDS (Fast Reliable Instant Efficient Network for Disbursement of Services), a key mission mode e-Governance (G2C) initiative of Government of Kerala and a joint venture of the Department of Information Technology (IT) and Local Self Government Institutions (LSGI), was started as a pilot project in the year 2000 in Thiruvananthapuram district (FRIENDS Janasevanakendram). This application provided facilities to the residents of Kerala State to pay their utility bills, tax and other dues to Government through a single window integrated remittance centre, without any extra cost. It was rolled out to the remaining 13 districts of Kerala by 2001.

The IT Department is responsible for running the Project in the space provided free of rent by LSGIs. Departments of Revenue, Motor Vehicles, Electrical Inspectorates, Civil Supplies, Kerala Police and agencies like KSEB[57], Kerala Water Authority[58], BSNL[59], Kerala State Cultural Activists Welfare Fund Board and Universities of Kerala and Calicut and Mahatma Gandhi University are the participating Departments/Agencies. Among these Departments/Agencies, except BSNL, all others provide their staff members on working arrangements and the expenditure towards their pay and allowances are met by the parent Departments/Agencies concerned. As BSNL does not provide staff members, they pay commission[60] to the Project for collection pertaining to BSNL bills.

The application software titled FRIENDS developed by Centre for Development of Imaging Technology (C-DIT[61]) in client server architecture was deployed as local area network application software and put to use from 2000.

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[57] Kerala State Electricity Board Ltd is a public sector agency under the Government of Kerala that generates and distributes the electricity supply in the State

[58] Kerala Water Authority was established on 1 April 1984 as an autonomous body of Government of Kerala by converting the erstwhile Public Health Engineering Department, for the development and regulation of water supply and waste water collection and disposal in the State of Kerala

[59] Bharat Sanchar Nigam Limited (BSNL), incorporated on 15 September 2000, took over the business of providing of telecom services and network management from the erstwhile Central Government Departments of Telecom Services and Telecom Operations

[60] Commission of ₹5 per each BSNL Mobile/CDMA phone bill and ₹6 per each BSNL Landline phone bill

[61] Centre for Development of Imaging Technology (C-DIT) established in 1988 by Government of Kerala with a vision to ensure advancement of research, development and training in imaging technology

Subsequently, a centralised web based re-engineered software titled FRIENDS Re-engineered Enterprise Enabled System (FREES), developed by National Informatics Centre (NIC) on JAVA platform, was launched in 2010 in Thiruvananthapuram district and rolled out to all other districts by March 2013. FREES package runs with the operating system Red Hat Enterprise Linux Server Release 5.8. PostgreSQLPlus Standard Server 9.2 is used in database servers, JBoss EAP 5.1 in application servers and Apache 2.2.3 in web servers. The system is hosted in the State Data Centre-2 at Thiruvananthapuram and connectivity to seven out of fourteen Janasevanakendrams is established through BSNL leased line, six through KSWAN[62] and the remaining one uses both the KSWAN and BSNL leased line. Hardware included 6 Intel Xeon servers and 2 AMD Opteron servers for the centralised web-based application (2 web servers, 3 application servers, 2 database servers and 1 test server).

4.2 Organisational Setup

Kerala State Information Technology Mission (IT Mission), an Autonomous Body under the Government of Kerala, is the implementing and monitoring agency of FRIENDS project. This project is managed by Director of IT Mission, who is assisted by Mission Coordinator (FRIENDS), who in turn coordinates activities of all the Centres.

There are fourteen FRIENDS Janasevakendrams, one each in every district headquarter. These Centres are supervised by two Project Managers (PM), who are in charge of each shift. The State Bank of Travancore deputes personnel to collect money from all Centres and credits in FRIENDS Pooling account. In variation to other Centres, Janasevanakendram Thiruvananthapuram has one Central Accounts Manager (CAM). As the application is not equipped with the provision for real time/online communication with the bank data, CAM is entrusted with the responsibility of reconciling the amount reflected in the Pooling account with that of the FREES application.
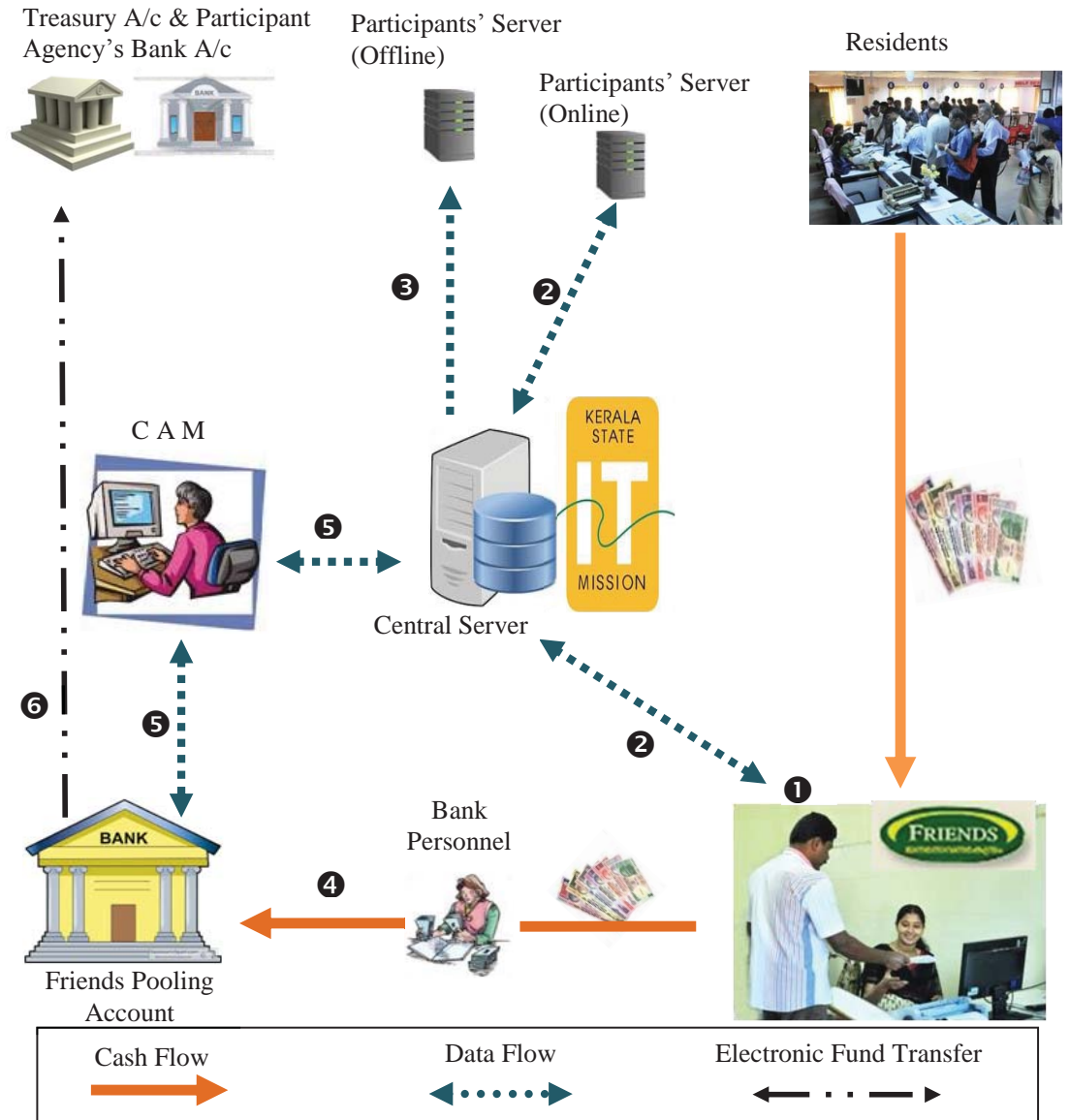
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[62] Kerala State Wide Area Network (KSWAN) is envisaged to be the core common network infrastructure for e-governance and the State Information Infrastructure, connecting all the 14 districts including 152 Block Headquarters.

4.3   FREES data flow and cash flow

Chart 4.1

Chart showing the cash flow and data flow

❶ Residents pay bills in various FRIENDS centres.

❷ Service Officers access central server for bill transaction. Where real-time server connectivity is established, central server fetches data from Participants' servers and update the participants' servers with transaction details.

❸ Collection details are sent to Participants, which are offline, for updating at their end.

❹ Bank personnel collect money and deposit in FRIENDS Pooling A/c.

❺ CAM accesses FREES data and reconciles with Bank data and authorises electronic fund transfer.

❻ Government account and the participating bank accounts, as the case may be, are credited by debiting the Pooling A/c.

(Source: Information obtained from the IT Mission Headquarters)

4.4   Audit objectives

The objectives of the information system audit are to assess whether:

- The objective of FRIENDS/FREES to facilitate residents to remit taxes and other utility payments due to Government through a single window payment system has been achieved;

- Collection of dues by the participating departments has improved by partnering with FRIENDS/FREES and

- The system design and the controls provide assurance that the interests of residents and participating departments are protected.

4.5   Sources of audit criteria

- System Requirement Specification (SRS) and Project documentation.

- Minutes and Decisions of the Governing Body and Circulars issued by the Government and IT Mission.

- IT Policy, 2012 of Government of Kerala.

- Best international practices adopted in IT projects contemplated in Guidelines issued by INTOSAI[63] (Information System Security Review Methodology) and ASOSAI[64] (Information System Security Review Methodology) for Information System Audit.

4.6   Scope of audit

Audit analysed the implementation of re-engineered application FREES for the period from June 2010 to March 2014. Audit also analysed the FRIENDS system to assess whether the lacunae in the old system have been addressed in the new application FREES.

4.7   Audit methodology

Audit was conducted during October 2013 to January 2014, and from June to July 2014. An entry conference was held with the Secretary to Government, Information Technology on 4 October 2013. In addition to the IT Mission in Thiruvananthapuram, audit team visited Janasevanakendrams in Thiruvananthapuram, Idukki, Ernakulam, Malappuram, Kozhikode and Kannur for verification of the working of the system and held interviews, on the basis of

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[63] The International Organisation of Supreme Audit Institutions (INTOSAI) operates as an umbrella organisation for the government audit community. It provides an institutionalised framework for supreme audit institutions to promote development and transfer of knowledge, improve government auditing worldwide and enhance professional capacities, standing and influence of member SAIs in their respective countries

[64] ASOSAI (Asian Organization of Supreme Audit Institutions) is one of the Regional Groups of the International Organization of Supreme Audit Institutions (INTOSAI)

questionnaire prepared for the purpose, with end-users to assess the usefulness and user- friendliness of the software. A beneficiary survey[65] was also conducted with residents to assess the level of services rendered by the project, and the satisfaction of the residents about this project.

An exit conference was held (9 December 2014) with the Principal Secretary to Government (IT), wherein the audit findings were discussed. Views of the State Government and their replies have been incorporated in the report suitably.

4.8 Acknowledgement

Audit would like to acknowledge the cooperation extended by the Principal Secretary to Government (IT), Chairman and Director of IT Mission, officers and staff, and the heads of Janasevanakendrams visited by audit team.

Audit Findings

4.9 Poor System design

4.9.1 User Requirement Specification (URS) and System Requirement Specification (SRS)

The properly documented User Requirement Specifications (URS) obtained from users and System Requirement Specifications (SRS) by the software development team ensure that the needs of the users of the system have been taken care of and the software developed meets the business requirements. However, Audit noticed that User Requirement Specifications were not prepared. System Requirement Specifications for the re-engineered application FREES was thus prepared without obtaining the requirement of all stakeholders. In the absence of URS, Audit was unable to assess the achievement of intended benefits of the project.

4.9.2 Lack of system automation

Even though FREES is a centralised web based application, Audit noticed manual interventions in the processes, which could have been avoided with proper system design. These issues pertained to the core functionalities of the application which led to serious control failures. The issues identified in test check are given below:

- Audit noticed that the money remitted in various FRIENDS Centres was being collected by the banking personnel deputed by concerned bank branches. The collected amount is transferred to the respective account of FRIENDS Project (i.e. Pooling account maintained at State Bank of Travancore, Thiruvananthapuram). In the absence of proper planning, the system was not automated to ensure electronic data interchange[66] with the

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[65] The questionnaire prepared for the survey is given in **Appendix 4.1** and the result of survey in **Appendix 4.2**. Relevant portions of the result of survey have also been included along with audit comments

[66] Electronic data interchange (EDI) is an electronic communication system that provides standards for exchanging data via any electronic means. By adhering to the same standard, two different entities can electronically exchange documents (such as purchase orders, invoices, shipping notices, and many others)

FRIENDS Centre and the bank, instead the CAM was given the responsibility to reconcile the FRIENDS Pooling Account data with that of FREES application manually, which is avoidable.

- BSNL paid commission to the project for collection pertaining to each BSNL bill. The system did not make provision for transferring the net amount to BSNL after deducting the commission due from BSNL automatically. Instead the whole amount was transferred to BSNL, who worked out the commission and this amount was credited to an account exclusively maintained for this purpose by each of the FRIENDS Centres. The money in this account was subsequently credited to Government account and to Akshaya District Project Office. This procedure was not only inefficient, but also prone to misuse and embezzlement. Audit data analysis revealed an embezzlement of ₹3.53 lakh in Kozhikode Centre from this account by drawing personal cheques, which could have been avoided with proper system design.

4.9.3 Non-adherence to database normalisation principles and improper designing of tables

Database Normalisation is the process of organising the fields and tables of a relational database to minimise redundancy. Normalisation usually involves dividing large tables into smaller (and less redundant) tables and defining relations between them. Audit noticed that database normalisation principles were not followed and there were deficiencies in designing of tables as detailed below:

- The primary transaction table named 'Collection_Master' contained 1,08,76,286 records as on 8 April 2014 and audit analysis has revealed that of these, 97,32,401 records related to the financial year (FY) 2013-14, 9,72,051 records related to the FY 2012-13, 13,107 records pertained to the FY 2011-12 and 758 records related to the FY 2010-11. Storing of these records in the respective tables/databases for each of the past financial years as historical data, could have increased the processing speed.

- The transaction table was used to store bill collection details (Collection_Master) that automatically captured the date and time of collection in one of its fields (Updated_On), with which the collection pertaining to each day and shift were identified. There was another table (Bank_Remittance) to store particulars about crediting of the collected money into the bank account. Instead of storing the date of collection, 'Bank_Remittance' table had two fields to store 'collection-from-date' and 'collection-to-date'. Audit observed that due to this design deficiency, relationship between these two tables could not be established.

- Similarly, Payment_To_Departments table stores payments to participating departments/agencies. Here also direct relation of this table was not established with the collection table so as to enable generation of reports of date-wise payments to departments concerned.

Due to the deficiencies in the design of tables as mentioned above, meaningful MIS reports for monitoring the timely remittance of money collected from FRIENDS Centres to the banks and to the participating departments could not be generated. This along with lack of proper system automation (as mentioned in paragraph 4.9.2) resulted in instances of embezzlement and delay in remittance to bank as detailed below.

4.9.3.1 Embezzlement of cash - FRIENDS application

In the erstwhile FRIENDS application, Project Manager in Ernakulam embezzled an amount of ₹15.99 lakh relating to the collection of 18 August 2012. The FRIENDS application did not have provision for capturing details of date of remittance into bank, which was one of the reasons due to which the embezzlement could not be detected. It was detected only after BSNL made a formal representation to the Director of IT Mission on non-receipt of the amount due to them. This amount has not been remitted till date (December 2014) and the notional interest at the rate of 18 *per cent*[67] *per annum* on account of this would work out to ₹6.96 lakh as on 1 January 2015.

Audit noticed that, during this period, a whistle-blower was repeatedly reporting to the IT Mission about the suspected fraudulent activities of the Project Manager in the Centre. The whistle-blower sent six intimations[68] to the IT Mission during the period from March to October 2012. All of these letters were ignored and actions not initiated until BSNL made the complaint.

Audit also noticed that the Project Manager deliberately defaulted in depositing the collected money into the bank by providing misleading information to the bank. During the period from January to October 2011 there were defaults in remitting cash once or twice a month, which increased to 16 defaults in a month (October 2012).

Audit analysis relating to Ernakulam Centre for the period from January 2011 to March 2013 revealed that in 163 instances there were delays in remitting cash to bank. Audit analysis further revealed that during this period not only the frequency of non-remittances increased, but also the number of days the money retained by the Project Manager (PM) also increased. In four instances, the money retained by the PM ranged from 35 days to 287 days as shown in **Table 4.1.**

Table 4.1: Details of remittances of cash into bank, where the delay exceeded one month

Collection date	Remittance date	Amount (₹ *in lakh*)	Delay in days
28/05/12	12/03/13	9.36	287
27/09/12	12/03/13	27.14	165
21/10/12	27/12/12	3.52	66
23/04/12	29/05/12	13.05	35

(Source: Analysis of data obtained from FRIENDS Centre, Ernakulam)

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[67] Penal interest is generally charged at the rate of 18 *per cent per annum*.
[68] E-mails dated 20 Mar 2012, 29 Mar 2012, 23 Apr 2012 and letters dated 10 Oct 2012, 27 Oct 2012 and 30 Oct 2012

From November 2012, the money kept out of public exchequer was as high as ₹87.33 lakh with an average of ₹33.98 lakh per day. Data analysis revealed that owing to delay in bank remittances from the above 163 instances, the accumulated amount of money kept out of public exchequer was ₹15.21 crore in Ernakulam Centre alone with consequent notional loss of interest.

The Government stated (November 2014) that disciplinary and criminal procedures were initiated against the erring Project Manager. Actions were also initiated to recover the short remittance from the offender. The reply is not tenable in audit as the project has quantified the embezzled amount as only ₹15.99 lakh and has not addressed the issue of rectifying the deficiencies in the system. Some of the systemic issues, which caused the embezzlement, are still present in the newly developed and implemented re-engineered application FREES.

4.9.3.2   *Embezzlement of cash –FREES application*

The re-engineered application FREES was launched with the aim to facilitate central monitoring and to manage the daily collection at all the Centres effectively. However, Audit observed that in view of the system deficiencies referred to in the paragraphs 4.9.1, 4.9.2 and 4.9.3, delays in remittance of cash to bank continued, which has resulted in embezzlement of cash at Kozhikode Centre.

Consequent on the media report on embezzlement of cash at Ernakulam Centre and having learnt about the delay in remittance of cash at Kozhikode Centre, the Inspection Wing of the Finance Department of Government of Kerala made a surprise visit to Kozhikode Centre on 8 November 2013. The physical verification of cash at the Centre revealed cash deficit of ₹1.01 lakh, which has not been remitted till date (December 2014).

Audit data analysis revealed that there were 157 instances of delay in remittance of cash into bank during the period since the installation of FREES (16 January 2013) in Kozhikode Centre till the Project Manager was booked on 8 November 2013. The delays ranged up to 9 days. During this period, from the above 157 instances, the accumulated amount of money kept out of public exchequer was ₹11 crore with consequent notional loss of interest.

The Government stated (November 2014) that criminal procedures were initiated against the erring Project Manager. The reply is not tenable in audit in view of the fact that the reply is silent on mitigating the risk by resolving system deficiencies, which cause these embezzlements.

4.9.3.3   *Delay in remittances into bank*

Analysis of FREES application data revealed delays in remittances of money collected to bank in 2,749 instances. The delay ranged from one to 30 days. Owing to delay in bank remittance, the accumulated amount of money kept out of public exchequer from all the Centres was found to be ₹136.02 crore[69] with consequent notional loss of interest till the end of financial year 2013-2014. Audit cannot rule

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[69] This amount includes ₹11 crore referred to in the previous paragraph

out the possibility of embezzlement of cash/ utilizing Government money for private use during these periods.

4.9.4   System deficiencies resulting in data loss

Data loss is an error condition in information system in which information is destroyed by failures or neglect in storage, transmission, or processing. Analysis by audit has revealed system deficiencies resulting in data loss and the examples are given below:

- One user identified by the code "SSK" did not log in to the system on 12 May 2013 as per the login table, whereas the same user collected money on the same date as seen from the collection table.

- As per the data available in the login table, the user "SKA" logged in to the system on 22 March 2010 only during the period from 09:20:45 to 09:26:07, 09:26:20 to 09:38:40 and from 14:26:21 to 14:29:36. However, as per the data available in the collection table, the same user collected 43 bills at 09:39:13, 09:47:48, 09:54:06, etc. Data analysis revealed 304 such cases establishing data loss.

- There were 2684 instances, where those logged in were not seen logged out on the same day.

Loss of data while saving records is a serious risk in an information system, which requires to be addressed immediately.

4.9.5   Non-creation of essential master table

A good database needs to be designed to ensure minimum level of mistakes at the time of data entry. One of the methods to achieve this objective is by designing master tables and transaction tables with a master-detail relationship between master table and transaction table. The master table will work as a lookup table from which proper data values can be picked up in the user interface for restricting junk values to be stored in the tables. Correctness of data in the master and standing files is of vital importance and critical to the processing and reporting of financial and operational data as the information on master files can affect many related transactions and must therefore be adequately protected.

There is a table to store user credentials of every staff member. Data in the designation field of this table is entered/updated by each of the Project Manager whenever a change takes place. As the designation field is an element required for grouping in generation of various MIS reports, uniqueness of data in the field is vital. To ensure unique capturing of data in the field, the designers could have created a table for designation, in which the values were to be stored at the design stage and authenticated at the requisite level. The designation field of user table could be designed as a list box[70] linked to the designation table. Audit noticed that in its absence, the designation of Service Officer was repeated several times with

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[70] A list box is a graphical control widget that allows the user to select one or more items from a list contained within a static, multiple line text box

different spellings (like 'Service Officer', 'serviceofficer', 'so', 'sERVICEoFFICER', 'ServiceOfficer', etc.) causing inaccuracies in MIS report generation.

4.9.6 Deficiency in user interface

In the case of Municipal Corporations, where real time connectivity is available (referred to as 'web-driven' mode in the application), when a bill is produced to a Service Officer (SO) for effecting payment, the SO has to input key information, like consumer number, bill number, bill date, district, ward/section/sub section, etc., to fetch the actual bill amount from the server. If responses from the server are not received within a reasonable time owing to high network traffic or unmanageable server hits, the SO has the option to switch to 'customer-driven' mode that would enable him to input the billed amount from the bill. However, Audit noticed that on such occasions, when the SO switched to customer-driven mode, the already entered data was deleted compelling the user to enter the data again.

4.10 Control activities

4.10.1 Managerial Controls

4.10.1.1 Absence of IT steering committee

IT steering committee typically performs the following roles and fulfills these responsibilities:

- Develops policy, develops an operating charter formalizing these roles and responsibilities

- Develops and maintains a set of project "Vision and Goals".

- Manages scope, cost and the project and champions business process improvement

- Coordinates with related projects and programs and obtains support from stakeholders.

However, Audit has observed that the Government of Kerala has not constituted an IT steering committee denying the valuable benefit such a committee could have provided to this project. Being an IT system, there should be constant upgrade of the application in line with the technological advancements. If not, the system will become outdated and lose relevance. In the case of FRIENDS, even basic enhancements like provision for accepting payments through credit/ debit cards could not be incorporated into the application. Though there were instances of multiple embezzlements and delayed remittances due to system design deficiencies, concrete action was not taken to address the noticed system deficiencies, which caused such irregularities.

Automated emails and mobile messaging services for enabling real time managerial monitoring of delay in bank remittances and transfer credit to stakeholders

concerned were not made use of. Real time assessment of server downtime, network traffic, server hits, time taken for each transaction, etc., by utilisation of metadata[71] was not considered. All these point to failure of managerial oversight, which could have been addressed, if an IT steering Committee was in place.

4.10.1.2   *Absence of post implementation review*

A Post Implementation Review (PIR) is an activity that is carried out after a new business system has been implemented. The objectives of PIR are to assess the system functionality, performance, and cost versus benefits and to assess the effectiveness of the life-cycle development activities that produced the system. The review results can be used to strengthen the system as well as system development procedures and re-engineering. But, Audit noticed that the Management had not conducted any post implementation review of this application.

There was no provision in the erstwhile FRIENDS application to store the details of remitting the collected amounts into banks and their final transfer to the accounts of concerned stakeholders. These deficiencies prevented the top Management from exercising managerial controls. The lacunae in the system paved the way for embezzlement of cash. The deficiency continued to exist in the re-engineered application FREES also.

The Government stated (November 2014) that instructions were issued to the CAM to inform the Management about the delay in remittance on a daily basis. The reply is not tenable in audit in view of the fact that instead of adopting manual monitoring mechanism, the system should provide facilities to generate required MIS reports for enabling centralised monitoring by the Management as envisaged by the re-engineered application software.

4.10.1.3   *Revoking of validation controls*

Designing of tables without properly relating 'Collection_Master' table with 'Bank_Remittance' table was pointed out in paragraph 4.9.3. Audit noticed revoking of validation controls leading to duplication in dates stored in the table relating to bank remittances. Insufficient validation controls resulted in generating challans again in respect of deposit to banks, which were already generated. Thus overlapping dates caused duplicate values in generation of reports. Data analysis brought to light 2,068 duplicate values in 'collection-from-date' and 2,067 duplicate values in 'collection-to-date' rendering the data useless for any MIS reports.

4.10.2   Delay in collection of cash by designated bank

As per the MoU signed with banks, the banks were to depute personnel to collect money relating to the second shift of the previous day and first shift of the day from all the Centres at 2.00 PM on every bank working day (except Saturday, on which the collection relating to the second shift of the previous day would be collected at

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[71] Metadata is 'data about data'. The main purpose of metadata is to facilitate in the discovery of relevant information. Metadata also helps organize electronic resources, provide digital identification, and helps support archiving and preservation of the resource.

11.00 AM) thereby permitting the money collected on Saturday and Sunday to be kept out of the public exchequer. Moreover, during the test check, Audit noticed that in the month of October 2013, out of the 24 bank working days, money was collected only on 16 days from Thiruvananthapuram and Kozhikode Centres. However, no communications were sent to banks either by Project Managers of the respective Centres or by the IT Mission, which indicated lack of managerial controls by the organization.

4.10.3   Human resource management

Human Resource Management (HRM) is the strategic and coherent approach to the management of an organization's most valued assets who individually and collectively are responsible for the effective and proper functioning of IT system.

FRIENDS Centres are supervised by two Project Managers (PM) deputed from participating Departments/Agencies. Service Officers (SO) deputed from participating Departments/Agencies on working arrangement in each District Centre are entrusted with the responsibility of bill collection. Audit observed the following lapses in HRM.

- No qualifications were prescribed for the selection of personnel for the project.

- Responsibilities entrusted were not in line with their qualifications and seniority. As no additional remunerations were offered for higher responsibilities of Project Managers, senior staff members were reluctant to accept responsibilities and juniors were posted as Project Managers, who were unable to exercise supervisory controls over seniors.

- Adequate training was not imparted due to which the staff had to struggle with their work. Training to staff members was imparted only at the launch of erstwhile application FRIENDS (2000-01) and at the installation time of the re-engineered application FREES (2010-11). Audit noticed that in all the six Centres visited, only 22 out of 75 existing PMs and SOs have received training.

- No norms were fixed by the IT Mission for the time taken in processing a bill and hence wide variations existed in average number of bills processed by different SOs. Data analysis for the financial year 2013-14 revealed that variation in average number of transactions per shift made by various SOs in all the Centres was up to three times as shown in **Appendix 4.3.** Audit analysis also revealed frequent long interval between two consecutive transactions made by the SOs, whose average transactions were low, whereas continuous transactions were seen in respect of others in the same Centre on the same day. Some of the illustrative cases are shown in **Table 4.2.**

Table 4.2: Interval between two consecutive transactions

Alappuzha Centre (User 'ANK')		Kollam Centre (User 'BNG')	
Transaction Time	Interval (H:M)	Transaction Time	Interval (H:M)
15.05.2013 14:35:25		06.01.2013 11:13:49	
15.05.2013 18:41:43	**4:06**	06.01.2013 12:54:34	**1:40**
22.11.2013 13:07:25		13.01.2013 09:30:57	
22.11.2013 17:43:03	**4:35**	13.01.2013 10:30:08	**0:59**
		13.01.2013 11:58:04	**1:27**
03.01.2014 10:20:43			
03.01.2014 12:44:45	**2:24**	20.01.2013 12:02:56	
		20.01.2013 13:20:25	**1:17**
03.01.2014 12:50:13			
03.01.2014 17:57:46	**5:07**		

(Source: Analysis of data obtained from IT Mission Headquarters)

The Government stated (November 2014) that due to manpower shortage, volunteering senior staff members are given charge of Project Managers. The reply is not tenable in audit, because considering the importance and money value involved in each centre, only qualified persons should be selected as Project Managers.

4.10.4 Lack of documentation and version control

Adequate documentation is one of the essential elements in any application development. Appropriate control over software versions requires sufficient documentation to ensure accuracy in data processing, especially in centralised data processing through web where financial data transfer is involved.

Audit noticed that no version numbers were marked in the application. There was no formal/documented system of complaint booking. Instead, whenever any bugs were noticed, users were lodging their complaints through telephone calls to database administrators. After making changes in the application on the basis of these telephone calls, patches[72] would be installed in the real time system without documentation, adequate test run, obtaining approval at the requisite level and marking the software with a version number. The consequences are pointed out in paragraph 4.10.5.

4.10.5 Absence of change control mechanism

Proper Change Control Mechanism ensures that all changes to system configurations are authorised, tested, documented, controlled, the systems operate as intended and that there is an adequate audit trail of changes. Change control mechanism reduces the possibility of introducing unnecessary changes in the

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[72] A patch is a piece of software designed to update a computer program or its supporting data, to fix or improve it. This includes fixing security vulnerabilities and other bugs, and improving the usability or performance.

system without foresight, which could introduce flaws into the system or undo changes made by other users of software. Instances of changes introduced which compromised the objectives of the project are detailed below:

- In test check, Audit observed that changes introduced in the application without adequate testing resulted in erroneous addition of an amount upto ₹0.65 lakh in the daily account due to be transferred to the head of accounts relating to e-District from the FRIENDS accounts. The mistakes continued to occur during the period from 9 January to 7 February 2012 before it was identified by the Project resulting in wrong debit of ₹10.74 lakh from FRIENDS accounts.

- Similarly Audit also observed that the system generated counter-wise collection reports and bank/treasury summary reports did not match after introducing an untested change. This resulted in confusion, because the amount collected from the counters and the amount to be remitted to bank did not tally. The difference between the two accounts ranged from a low of ₹17.91 lakh in Kollam Centre to a high of ₹1.82 crore in Ernakulam Centre.

The details of mismatch found in seven Centres are shown in **Table 4.3.**

Table 4.3: Details of discrepancies between the amounts as per counter wise collection reports and bank/treasury summary reports

Sl. No.	Name of Friends Centre	Amount as per counter wise collection report (₹)	Amount as per bank/treasury summary report (₹)	Difference (₹)
1	Palakkad	3,17,961	57,23,298	**54,05,337**
2	Kollam	1,05,357	18,96,426	**17,91,069**
3	Malappuram	1,27,324	22,91,832	**21,64,508**
4	Pathanamthitta	2,92,853	52,71,354	**49,78,501**
5	Thiruvananthapuram	4,46,052	80,28,936	**75,82,874**
6	Alappuzha	2,67,105	23,38,542	**20,71,437**
7	Ernakulam	10,69,864	1,92,57,552	**1,81,87,688**

(Source: Figures obtained from the respective FRIENDS Centres)

The Government stated (November 2014) that ₹10.74 lakh was re-credited to FRIENDS pooling account. The reply is not tenable in audit since the project has not addressed the issue of introducing appropriate change control mechanism to avoid recurrence of such incidents.

4.11   IT Security

4.11.1   Lack of information security control

Confidentiality, integrity and availability are to be the core principles of information security. Installation of antivirus software[73] helps in reducing threat to data caused by virus attacks. Audit observed the following lapses in this regard:

- The Project did not have an IT Security Officer.

- No mechanism was available for recording and reporting security incidents.

- IT Security instructions were not circulated periodically to staff.

- USB[74] ports were not disabled in four Centres[75].

- Licensed versions of antivirus packages were not installed in any Centre. Freeware antivirus packages were being used in Thiruvananthapuram and Ernakulam Centres, but both these Centres were not updating virus definition files. Systems were seen infected with virus in Malappuram Centre, which was not using antivirus packages. In Ernakulam Centre, virus infection caused non-performance of the system for one day.

- Periodic changes of passwords were not ensured. Data analysis revealed that 366 users had never changed their passwords.

- No instructions were issued on password policy specifying the structure and length of password, changing of passwords, secrecy to be maintained, etc.

- In three out of six Centres visited, user-ids and passwords of Project Managers were shared with others defeating the very purpose of logical access controls.

4.11.2   Failure in deactivating user-ids of retired/transferred employees

Best IT practices demand that in the case of retirement or transfer of employees, the system administrator should immediately deactivate user accounts to prevent unauthorised access to the system. However, Audit noticed that in all the Centres visited, the active user-ids exceeded the total number of the existing personnel as shown in **Table 4.4.**

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[73] Antivirus software is computer software used to prevent, detect, remove malicious software and to provide protection from other computer threats

[74] Universal Serial Bus (USB) is an industry standard developed in the mid-1990s that defines the cables, connectors and communications protocols used in a bus for connection, communication, and power supply between computers and electronic devices. USB drives are observed to be highly prone to transmission of virus.

[75] Idukki, Ernakulam, Kozhikode and Kannur

Table 4.4: Comparison of existing active user-ids against the existing personnel

Sl. No.	FRIENDS Centre	Number of active user-ids	Number of existing personnel
1	Thiruvananthapuram	97	29
2	Idukki	11	8
3	Ernakulam	37	13
4	Malappuram	25	15
5	Kozhikode	18	13
6	Kannur	27	15

(Source: Analysis of data obtained from the respective FRIENDS Centres)

Being a web based system, such control deficiencies could provide an opportunity for misuse by unscrupulous persons.

The Government stated (November 2014) that actions were initiated to disable the user-ids in respect of past employees and 323 login accounts have already been terminated. Audit is of the view that continued monitoring is required in this regard.

4.11.3 Inadequate segregation of duties

Segregation of duties ensures that the data stored is authenticated at various levels of supervisory officers. Inadequacies in this would increase the risk of errors being made and remaining undetected, fraud and the adoption of inappropriate working practices.

Project Managers had the exclusive responsibility to open and close shifts in the application by privilages granted to them in the system. Generation of challan for remitting money into bank and confirmation of transfer credit of the same to the FRIENDS Pooling account were also the exclusive duties of Project Managers. But in all Centres visited, Audit noticed that these duties were performed by either System Administrators or Service Officers defeating the very purpose of segregation of duty.

4.11.4 Risk to IT assets

Audit observed that Idukki centre had several shortcomings in the facilities and the infrastructure provided posed risks to IT assets as discussed below:

- The Centre is functioning from a dilapidated building, that could not be closed as shown in picture below. There is only one security guard looking after the centre with no substitute arrangements when he is on leave.

Picture depicts view of Idukki Centre, where the steel shutter cannot be closed. The shutter channel is blocked with wooden logs to prevent collapsing of the damaged steel shutter. Inset picture displays a wooden log used as blockade.

- The Centre deviated from the established procedure of remitting the daily collection in the bank. Even when a single day's collection was as high as ₹9.55 lakh during the period, the bank did not send their staff to collect the cash. Since the cash could not be kept in the Centre due to safety reasons, the staff members were compelled to carry the cash home and bring it back on the next day.

The deviations noticed in other Centres are as follows:

- Scrap was dumped over UPS and battery posing a fire risk and the abandoned computers and other unused hardware were not disposed off in 2 out of 6 Centres visited by audit team as shown in picture below**.** In two Centres the air conditioners were not working properly.

Picture shows dumping of scrap over the UPS, battery and near the counters in Thiruvananthapuram and Malappuram Centres.

The Government stated (November 2014) that the scrap had since been disposed of from Centres in Thiruvananthapuram, Kollam, Pathanamthitta, Malappuram, Kannur and Kottayam and instructions had been issued to other Centres for disposal.

4.12 Business continuity and disaster recovery planning

Business continuity planning (BCP) is working out how to stay in business in the event of a disruption. Audit noticed that appropriate business continuity plan and disaster recovery planning have not been formulated.

4.12.1 Inadequate backup facilities

Backup refers to copying and archiving of computer data so that it may be used to restore the original after a disaster and also to restore files after they have been accidentally deleted or corrupted. Offsite storage of backup data would ensure resuming the business with minimum time lag in the event of a disaster like fire, flood, etc.

While appreciating the measures adopted for ensuring backup, Audit observed that the project had not ensured offsite storage of backup. Instead the backup was stored in the same location, where servers were placed. All the servers and tape cartridges were kept on the ground floor adding high risk to the data.

4.12.2   Flaws in the terms of annual maintenance contract (AMC)

Business Continuity Plan should also ensure that an entity's business operation is not interrupted owing to power failures and hardware failures. Entering into agreements with AMC providers would ensure minimum interruption to the business. However, Audit noticed several flaws in the terms of contract and lack of control over the AMC provider adversely affecting business continuity, as indicated below.

- No hardware downtime reports were obtained from AMC provider, though fortnightly report was stipulated in the terms of the contract.

- There was no clause relating to levy of penalty in the event of failure in providing timely services.

- Though the latest time to attend a fault call was stated to be 24 hours, no time limit was fixed for rectification other than a passive statement 'in the earliest possible time'.

- Though preventive maintenance was stipulated to be done once in three months, no registers were maintained to monitor the preventive maintenance.

- No preventive maintenance was reported to be done except in Malappuram Centre.

- Hardware status/fault registers were not maintained in three out of six Centres visited. In Thiruvananthapuram and Malappuram Centres they were maintained only up to April 2010. In Kozhikode Centre, the dates of rectifications were not entered.

- In Thiruvananthapuram Centre, in one of the cases, the delay in rectification was 18 days and in another the delay was 15 days during the period test checked (2008-2010). In 56 *per cent* of cases, the delay could not be ascertained as dates of rectifications were not entered.

4.13   Failures in realisation of a single window remittance system

Being a bill remitting centre, resident friendly measures would have ensured retention of customers and thus enabling the project to achieve its stated objective of becoming a single window integrated remittance centre. To enhance customer experience, the IT systems should have evolved to keep up with the technological advances in the external environment. But due to lack of vision and proper planning, this could not be achieved. Audit noticed following deficiencies in this regard:

- There was no provision for accepting payments from residents through credit and debit cards.

- There was no provision for accepting cheques from Government departments and autonomous bodies/corporations. Audit data analysis

revealed that there were 865 cash transactions that exceeded ₹1 lakh and that a single cash transaction was as high as ₹12.43 lakh.

- There were withdrawals of services like payment of land tax, building tax, luxury tax, lease rent and fees for services rendered by Revenue Department. Data analysis revealed 85.79 *per cent* of drop in bills relating to the Revenue Department.

Transactions of bills relating to KSEB (32.15 *per cent*) constituted one of the major business of the project. However, the number of transactions in respect of KSEB fell from 11.36 lakh to 6.7 lakh during the period from 2006-07 to 2013-14, even though direct connectivity to KSEB server was established in the FREES system from 2010 onwards.

The reasons, which contributed to the reduction, were as follows:

- KSEB did not permit FRIENDS Centres to accept power bills with fine after the pay-by-date for no meaningful reasons;

- FRIENDS Centres were not provided with provisional module to accept payments, when billing data was not uploaded in KSEB server;

- Network problems owing to high network traffic and unmanageable server hits were pointed out in paragraph 4.9.6. During a test check conducted in Ernakulam and Kozhikode Centres for the period from December 2013 to March 2014, Audit noticed KSEB server downtime recorded at these Centres ranged from 20 minutes to 10 hours per day as shown in **Table 4.5**.

Table 4.5: Details of KSEB server downtime in two Centres

Ernakulam				Kozhikode			
Date	**From**	**To**	**Duration (H:M)**	**Date**	**From**	**To**	**Duration (H:M)**
05/12/2013	2:05 PM	3:30 PM	1:25	20/01/2014	4:00 PM	7:00 PM	3:00
06/12/2013	9:30 AM	10:00 AM	0:30	30/01/2014	9:20 AM	9:45 AM	0:25
18/12/2013	10:50 AM	2:00 PM	3:10	03/02/2014	12:00 PM	7:00 PM	7:00
30/12/2013	12:40 PM	2:00 PM	1:20	04/02/2014	11:40 AM	7:00 PM	7:20
17/01/2014	1:00 PM	2:00 PM	1:00	04/03/2014	9:00 AM	9:45 AM	0:45
25/01/2014	11:00 AM	7:00 PM	8:00	05/03/2014	9:00 AM	9:30 AM	0:30
27/01/2014	9:00 AM	7:00 PM	10:00	19/03/2014	2:50 PM	7:00 PM	4:10
28/01/2014	9:00 AM	7:00 PM	10:00	21/03/2014	10:50 AM	7:00 PM	8:10

(Source: Analysis of data obtained from the respective FRIENDS Centres)

FRIENDS project was envisaged as a single window system, where the residents can pay all their utility bills at a single location. The system should be available at all times and there should not be any occasion, where the public has to return without paying their bills. However in the beneficiary survey conducted, 84 *per cent* of the public remarked that they had to return without remitting their bills. This happened due to the deficiencies mentioned above and thus the objective of providing single window payment system could not be achieved.

The Government stated (November 2014) that owing to network failures, especially relating to KSEB and Motor Vehicles Department, timely services could not be provided to residents. The issues regarding real time data fetching is also being taken up with KSEB. The reply is not tenable in audit, because many of the deficiencies mentioned above could have been rectified by timely intervention and coordination with the participating departments.

4.14 Non-realisation of objectives by participating departments

The participating departments envisaged faster receipt of their dues and reduction in cost of collection from this project. However, Audit noticed that these objectives of the participating departments were not achieved due to the following reasons:

- There was persistent delay in remitting the collected money to participating departments as detailed in paragraphs 4.9.3.1, 4.9.3.2 and 4.9.3.3.

- The MoU with the bank allowed for collection of money pertaining to Saturdays and Sundays only on Monday thus delaying the payments to participating agencies.

- The money embezzled has still not been paid to the participating agencies even after two years.

- In the absence of appropriate supervision and proper norms for work load, there was underutilisation of staff, who were deputed from the participating departments.

The absence of MIS reports due to improper system design made the monitoring of timely payments to participating departments extremely difficult. Thus due to lacunae in the system design and its implementation, the participating departments could not realise the full benefits of the FRIENDS/FREES project.

4.15 Conclusion

The main objective of the project was to facilitate residents to remit taxes and other utility payments through a single window system. But, poor system design and lack of proper integration with participating departments led to the failure in achieving this prime objective. The project suffered due to the absence of an IT Steering Committee, which is responsible for developing and maintaining vision and goal of the project, developing an operating charter for formalising the roles and responsibilities and providing guidance to help the system evolve with the changing environment. Current customer requirements, like provision for accepting payments through credit and debit cards were not incorporated into the newly developed FREES application. This has resulted in reduction in number of residents using this facility.

The system was incapable of generating adequate MIS reports for proper monitoring and assessing early warning signals. Unnecessary manual interventions were required in the process, which could have been easily avoided by appropriate system automation. Withdrawal of services and unsolved issues relating to KSEB

and other agencies indicate lack of timely managerial intervention and coordination with participating departments.

These deficiencies in the system have resulted in defeating the main objectives of

- facilitating the residents to pay their taxes and utility bills through a single window system and

- facilitating the participating departments to receive their dues effectively and efficiently.

This has also resulted in embezzlement of cash and delayed deposit of money in to the respective account due to poor system design and control failures.

4.16 Recommendations

- IT Mission should rectify the deficiencies and develop the system in tune with the changing environment like establishing required relationship among different data tables, enabling acceptance of debit and credit cards, etc.

- The State Government should ensure regular collection from FRIENDS Centres by the banks and modify the MoU so that money collected every day is remitted to the bank on the same day.

- All the issues pertaining to the participating departments should be resolved through proper coordination.

- Explore the option of adding new services and resumption of services already withdrawn so that FRIENDS becomes a single window system of remittance in true sense.

- Annual maintenance contract should be finalised incorporating penal provisions for delay in rectification.