MINISTRY OF RAILWAYS

CHAPTER: IX

Konkan Railway Corporation Limited

Financial Accounting module of ERP

Highlights:

There was inordinate delay in development and implementation of Railway Application Package (RAP).

(Para 9.3)

Under the Java based system called JpRAP, only one (FA Module) out of seventeen modules had been implemented although full payment of Rs.3.96 crore had been made.

(Para 9.5)

Certain critical design requirements were either not envisaged or envisaged but not designed and implemented resulting in continued dependence on manual controls.

(Para 9.5.1.1 to 9.5.1.3)

Linkages and interfaces of FA module with other modules though envisaged had not been implemented till date (September 2007).

(Para 9.5.2)

Validation checks were inadequate resulting in manual interventions.

(Para 9.5.3)

9.1   Introduction

Konkan Railway Corporation Limited (KRCL) was established in 1990 under the Companies Act, 1956 with the main objective of constructing and operating a Broad Gauge Railway Line for facilitating a well coordinated railway system for public and freight transport between Roha and Mangalore (760 Kms.) popularly known as Konkan Railways .

In order to facilitate effective functioning, KRCL developed an ERP system known as RAP containing seventeen modules which was developed by Tata Infotech Limited (TIL) in 1995 and implemented in 2001. The main objectives of RAP were to increase the efficiency in various financial and operational functions of the organisation and timely generation of various MIS reports to aid the Board of Directors of the Company in decision making. During 2004, KRCL decided to reengineer RAP system to java based system known as JRAP.

The IT system was managed by IT Group (ITG) at its Head Office, Belapur, Navi Mumbai which functioned directly under the Managing Director.

9.2 Scope and methodology of Audit

This IT Audit includes review of the overall objectives of ERP system, its development, implementation with the main focus on JRAP-FA module and its linkages with other modules[*]. It also included analysis of various controls in place viz. the general IT controls and application controls specific to JRAP- FA Module.

9.3 Railway application package

 RAP was developed over a period of six years at a cost of Rs.5.26 crore using 'Informix 4 GL' Propriety development tool. The front-end forms were developed using Informix 4GL forms and the data was maintained in RDBMS platform using 'Informix Dynamic Server'. The central database was maintained in Corporate Office, Navi Mumbai while the distributed database was maintained at 59 stations using 'Informix standard server' which were connected through dedicated optical fibre cable link. Digital alpha servers were used to run the application software using Digital UNIX as the Operating System (OS). After the expiry of warranty in 2002, KRCL maintained the system in-house as the rate quoted by TIL for maintenance of the system was very high. However, over the years (2002-04), KRCL was faced with major concerns regarding the future of the system like Alpha servers going out of production, inability to get propriety development tools of Informix forms rendering modification of the existing forms extremely complicated, usage of Informix 4GL as the front end allows only Character User Interface (CUI) which in turn does not allow it to web enable the existing application, etc. On finding that RAP was heading for technological dead-end due to the above factors, KRCL decided (April 2004) to reengineer the RAP system to open-ended Java based system known as JRAP.

9.4 Java based railway application package

 The work of re-engineering RAP into Java based Railway Application Package (JRAP) was awarded (April 2004) to M/s. Amritha Technologies Limited, at a cost of Rs.2.78 crore. This involved migration of RAP to JRAP on one to one basis keeping the old business rules intact and was expected to be completed and implemented by April 2005. Before taking up the project of migration of RAP to JRAP, KRCL did not carry out a techno economic feasibility study or review the existing system considering that substantial time had elapsed since the package was developed. The reengineered JRAP database is available on the server at Belapur, Navi Mumbai for the working of all the ERP Modules. The Dumb terminals[*] installed at Navi Mumbai Centre are replaced with thin clients[*] connected to the central application Xeon servers with Linux OS.

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[*] *Operation & Train Control, Commercial Coaching, Commercial Freight, Claims Module, Rolling Stock C&W, Rolling Stock Motive Power, Signal & Telecommunication Maintenance, Electrical Maintenance, Track & Structure Maintenance, Financial Accounting, Expenditure Authorisation, Annual Accounts, Traffic Accounts, Stores & Inventory, Personal Management, Security Administration, Health Management.*

[*] *A display monitor having no processing capabilities and is used as a output device that accepts data from the central processing unit.*

[*] *This is also called a lean client computer or client software in client-server architecture network which depends primarily on the central server for processing activities and mainly focuses on conveying inputs and outputs between the user and the remote server.*

9.5   Audit findings

The JRAP scheduled to be implemented by April 2005 had not been implemented till date (September 2007) except the FA module that had been implemented by January 2007 with deficiencies as explained in paragraph 5.1 infra. There was increase in cost from the estimated Rs.2.78 crore to Rs.3.96 crore and KRCL made full payment to the firm though the migration of all the seventeen modules of RAP to JRAP had not been implemented. Non-migration from RAP to JRAP of all the modules even after a lapse of three years not only defeated the very purpose of the exercise but also left KRCL saddled with the task of maintaining both the systems without much value addition.

9.5.1   JRAP-FA module

The JRAP-FA module is the back bone of ERP System. Considering the significance of the financial and accounting module and its linkages with other modules, the working of JRAP-FA Module was audited and it was observed that:

(i)   Some critical activities had not been envisaged during system development and consequently certain activities that were part of the user's requirement had not been designed/developed;

(ii)   Certain activities were designed/developed but with deficiencies;

(iii)   The linkages and interfaces of FA module with other modules were yet to be implemented (September 2007);

(iv)   The validation checks were inadequate, critical changes in business rules were not incorporated/updated; and

(v)   The business continuity and disaster recovery system were deficient.

The noted deficiencies were as under:

9.5.1.1 Critical requirements that were not envisaged

(i)   The system was not envisaged to generate region wise trial balances although separate regional cost centres were maintained. Thus, the system could not monitor and evaluate performance of different regions.

(ii)   Simple functions like calculation of tax deducted at source, sales tax, other taxes, etc. were not envisaged to be performed through the system. Thus, recovery/short recovery of the above items had to be calculated and monitored manually.

(iii)   The system was not envisaged to capture the accounting period to which the bill pertained to. Thus, important information like outstanding liabilities, prepaid expenses of the respective accounting period could not be generated. For example, a contactor's/supplier's bill which related to the accounting period 2006-07 could be accounted for in 2007-08 and vice versa, prepaid insurance for the period 2007-08 could be booked as expenditure in 2006-07.

(iv)   Critical information relating to contracts such as, date of completion, number of extensions, penalty waived, interest levied/waived for delayed completion/supply were not envisaged to be captured to enable the system based monitoring and evaluation of the execution of contracts.

Thus, defective planning and requirement specifications led to continued reliance on manual operations on important accounting aspects, thus, defeating the very purpose of computerisation, more importantly through an ERP system.

9.5.1.2 Critical requirements that were envisaged but not designed

(i)   The system envisaged to capture earning from activities such as rental bills, electricity/other charges in respect of station stalls, service charges for maintaining railway siding, etc., but provision for the same had not been built into the system resulting in all the above works still (September 2007) being carried out manually.

(ii)   It was envisaged that Asset Register (group/location wise) and data for Capital Work-in-Progress would be maintained and updated through the system but provision for the same was not built into the system.

(iii)   It was planned that investments made by the company would be monitored through the system to enable proper management of surplus funds but appropriate provisions were not incorporated in the system.

(iv)   The system was expected to capture details of security deposits, bank guarantees received from contractors/suppliers and monitor the validity of these instruments. However, no provision for this check was built into the system resulting in this work being carried out manually.

Thus, non provision of the functions/ activities envisaged to be carried out through the system led to manual interventions and under-utilisation of the computerisation.

9.5.1.3 System design deficiency

(i)   The system was not designed to calculate rates as a percentage above or below the accepted tender rates. This resulted in not only duplication of work but full dependence on manual controls.

(ii)   The system did not exhibit the opening balance of the ledger resulting in this being incorporated through manual intervention to prepare Trial balance.

(iii)   After creation of the master database, the system did not display relevant pop-ups at the time of entering the data which was required to ensure data integrity. This led to multiple party codes for the same party, in respect of supply contract, works contract and miscellaneous contracts.

The above deficiencies led to manual interventions which defeated the objectives of the computerisation.

9.5.2   Interfaces and linkages of various modules with FA module

Considering that Financial and Accounting activities are extensively integrated with other activities, the FA module was envisaged to have interlinkages with other modules. However, as only the FA module is operational in JRAP, the linkages and interface as envisaged could not be implemented till date (September 2007).

9.5.3   Validation checks

Validation checks are required to ensure that the data received for processing was valid, complete, accurate, properly authorised and entered in time without duplication to ensure

that the data conforms to business rules. Some of the deficiencies of validation checks noticed in audit are brought out below:

(i)   The system permitted booking of various bills relating to a contract or purchase order through 'Miscellaneous Payments' (MP) module by avoiding verification of terms of contract through system though such bills were required to be booked under Bills Payable (BP) module eg: HSD oil purchased, stores purchase, work orders. Data analysis of bills for the period 2004-07 revealed that 568 bills for more than Rs.50 lakh each and aggregating Rs.776.41 crore were booked through the MP instead of BP.

(ii)   System did not validate cost centre with the range of banks under its jurisdiction from which funds could be transferred. This led to risk of transfer of funds from a bank which was not under the jurisdiction of the cost centre.

9.5.4   Change management controls

A sound change management system should have provisions and procedure covering methodology for recording and incorporating changes in business rules/logics for ERP system to function effectively. It was observed that the change management procedure maintained by KRCL was not adequate as it did not provide for many critical changes in business rules to be incorporated/updated in the system such as changes relating to transporting of goods, rake movement, discounts, refunds, demurrages, retiring rooms, advertisements, catering/ vending services, traffic earnings etc.

9.5.5   Disaster recovery and business continuity plan

Considering the importance and criticality of ERP system, it is imperative for KRCL to have a sound disaster recovery and business continuity plan in place to ensure that in the event of a probable disaster, the interest and capacity of the company are not adversely affected. The plan maintained by KRCL was deficient such as keeping of replica server in the same room of primary server, non-existence of procedures for testing and checking the retrieval of backup data, training for implementing and maintaining the environmental equipments like fire/water detectors, fire extinguishers etc. Further, it did not maintain correct/current version of system software, emergency hot sites, which are essential for recovery from disaster.

9.6   Conclusion

There was inordinate delay of six years (1995-2001) in development and implementation of RAP application software. KRCL had not carried out techno-economic feasibility study which resulted in KRCL facing difficulties in maintaining the system and having to migrate within three years of its implementation of the RAP developed (2001) to JRAP(2004). Though JRAP complete with 17 linked modules was envisaged to be implemented by April 2005 and full payment of Rs.3.96 crore has already been made, only one (FA module) out of seventeen modules had been implemented by January 2007. Even in the FA module, there were critical system requirements that were not envisaged or designed. The critical interfaces with other modules that were envisaged were not possible as the other modules had not been implemented in JRAP till date (September 2007). The validation checks were inadequate resulting in controls still being carried out manually. The disaster recovery and business continuity plan was not in place thereby

exposing the data and the business to the potential risk of loss of data. Thus, the objectives of computerisation through an ERP system could not be met.

9.7   Recommendations

∗   The remaining sixteen modules of JRAP should be implemented in a time bound manner and enable linkages/interfaces between various modules.

∗   Deficiencies in system design, validation controls should be addressed.

∗   Changes in business rules/logics should be incorporated and critical information captured in the system should be subjected to validation controls so that accurate and timely MIS are generated to aid the management in effective decision making.

∗   The disaster recovery and business continuity plan should be reviewed, completed, updated and tested periodically.

The matter was reported to the Ministry (November 2007), its reply was awaited.