MINISTRY OF FINANCE

CHAPTER: IV

Bharatiya Reserve Bank Note Mudran (Private) Limited, Bangalore

Distribution and Manufacturing Modules under ERP

Highlights

The Company failed to include M/s Systime as joint signatory and released bank guarantee of Rs.2.37 crore in violation of terms of agreement to ensure their commitment to timely completion of the project.

(Para 4.7.1.1)

In-appropriate management of trained ERP core team resulted in non-utilisation of ERP system.

(Para 4.7.1.2)

The expected due professional care had not been exercised by the management while signing "Go Live" certificate.

(Para 4.7.1.3)

Large gaps in the customisation of the package resulted in non-utilisation of system and non-accrual of business process re-engineering benefits.

(Para 4.7.1.4 and 4.7.1.5)

Lack of application controls like input controls and system deficiency prevented the system from automatically detecting errors.

(Para 4.7.1.6 and 4.7.2)

The data was not encrypted and validated with digital signatures though secrecy of information handled by the Company was of utmost importance.

(Para 4.7.3)

4.1 Introduction

Bharatiya Reserve Bank Note Mudran Private Limited (the Company), wholly owned by the Reserve Bank of India, was formed on 3 February 1995 with two printing units at Mysore (Karnataka) and Salboni (West Bengal). Currency notes of denominations from Rs.10 to Rs.1,000 are being presently printed at the printing units. The Company's turnover as on 31 March 2007 was about Rs.975 crore.

Computerisation in the Company started from inception. In August 1996, M/s MECON was entrusted the work of developing an integrated software package. On its failure, M/s Price Waterhouse Limited., consultant recommended (January 1999) ERP as a solution. JD Edwards "One World" Xe software for ERP was procured along with hardware at a cost of Rs.13.98 crore. The 'Go Live' was signed in May 2004. ERP application was managed centrally at Mysore.

4.2 Organisational set up

The Information System Division function under Deputy General Manager (Technical) who reports to General Manager (Mysore Printing Press) and is supported by Manager (ERP) and Assistant/ Deputy Managers.

4.3 Scope of Audit

JD Edwards "One World" Xe ERP Software (JD Edwards) contains five modules viz. Distribution, Manufacturing, Finance and Accounts, Human Resources and Plant and Maintenance. The scope of Audit included a review of planning, acquisition, implementation and utilisation of the computerisation process and an examination of Distribution and Manufacturing modules of ERP with a specific thrust on transactions for the years 2005-06 and 2006-07.

4.4 Audit objectives

The information technology audit of computerisation of the Company was conducted to assess that:

(i) The implementation of the ERP system was preceded by a systematic planning and adequate assessment of operational requirements and needs;

(ii) The documentation was adequate to ensure efficient and continuous operation of the system;

(iii) The data generated was complete, reliable and followed the business rules of the Company;

(iv) The controls in the system provide reasonable assurance that the intended objectives were being achieved; and

(v) The IT resources both hardware and software were procured timely, economically, and utilised optimally.

4.5 Audit criteria

The following criteria were used to ascertain whether the objectives stated above had been achieved:

(i) Parameters stated in the ERP system, procedures vis-a-vis practices actually adopted.

(ii) Procurement of hardware and software with reference to actual implementation of the ERP system.

(iii) Generally accepted Best Practices in IT.

4.6 Audit methodology

Audit was conducted through review of records and documents, discussions and interaction with the Company officials, and data analysis through CAATs.

4.7 Audit findings

4.7.1 General controls

4.7.1.1 System acquisition, development and implementation

With a view to computerise the system, the Company procured hardware worth Rs.1.29 crore in January 1998. An order for Rs.67 lakh was placed on M/s MECON for development of software in August 1996. As software was not ready even by December 1998, the contract with MECON was terminated in February 1999 resulting in the entire expenditure of Rs.1.29 crore remaining unfruitful.

Subsequently, Company decided (February 1999) to introduce ERP and complete the project within two years to achieve the corporate objectives of cost minimisation and quality improvement. The ERP project consultant engaged by the Company recommended either SAP or Oracle software. However, bids were also called for from JD Edwards though JD Edwards was not recommended (June 2000) by ERP project consultant because of its high offer and lack of local support and inadequate coverage. The Company rejected submission of bid by M/s. NIIT on behalf of M/s Oracle on the ground of lack of direct engagement and commitment. The Company selected JD Edwards ERP viz. JD Edwards's "One World" at a cost of Rs.5.40 crore which had chosen M/s Systime, Mumbai as its implementation partner. The Management stated (September 2007) that the consultant had not explicitly referred to higher budgetary offer, lack of local support and inadequate coverage in respect of JD Edwards ERP Package in the feed back. The reply is not acceptable as the note to the Board stated that the consultant had not recommended JD Edwards due to higher budgetary offer and lack of local support.

On review of the Letter of Intent (LOI) (October 2000) and agreement signed (July/August 2001) with JD Edwards, the following were observed in audit:

(i) Though JD Edwards had quoted price directly and entered into an agreement with the Company for implementation of ERP, it had involved its Indian business partner M/s Systime right from price bid stage, while a similar proposal was rejected in the case of M/s Oracle. The Management stated (September 2007) that absence of direct commitment from M/s Oracle was the reason for the rejection of their bid as against direct commitment from M/s JD Edwards from the tendering stage. Reply is not acceptable since the involvement of M/s Systime was there right from the LOI stage and as such, non consideration of another similar offer deprived the Company of competitive offers.

(ii) Absence of direct involvement of JD Edwards made the Company dependent on M/s Systime the local implementation partner. The Company however, failed to include M/s Systime as joint signatories to hold them responsible for timely completion of the project. The Bank Guarantees (BGs) worth Rs.2.37 crore (valid till 31 May 2004) furnished by M/s Systime to ensure proper implementation of the package were also released on signing the 'Go-live' certificate. The release of BGs before the completion of contract was against the terms of contract and the interest of the Company. Since the Company did not have any control over M/s Systime and also released the BGs without ensuring complete implementation, Company could not take any action against M/s Systime to ensure complete implementation. The Management stated (September 2007) that upon live feeding of data from April 2004, the BGs were released. The Management's reply was not acceptable as the release of BGs even before resolving the pending issues was uncalled for.

(iii) Though milestones were defined in ERP implementation there was ambiguity about the timeframe in contract. As such even after six years of signing of the contract, implementation of the ERP was not completed across the Company and the Company could not impose any penalty. The Management stated (September) that the delay in implementation was beyond the control of JD Edwards as customisation of the specific requirements of the banknote industry in the application took time. The reply of the Management indicates that the user requirements study was deficient and absence of definite time-line stipulation in the contract deprived the Company of a necessary control to ensure timely implementation of the Project.

(iv) JD Edwards was taken over by M/s PeopleSoft in September 2003 and which in turn was taken over by M/s Oracle in 2005. M/s Oracle had demanded a payment of Rs.40 lakh *per annum* from 2004-05 towards updating of software even though they had not rendered any service to the Company during the period. Due to absence of any clause for continuity in execution of pending ERP project in the agreement in case of any eventuality like the take over of JD Edwards by any other Company, the Company could not get the software upgraded and could not fix the responsibility on M/s Oracle for unsuccessful implementation of ERP.

4.7.1.2 Depleted ERP team

For taking up the ERP implementation work, three ERP project teams for each of the three locations (Bangalore, Mysore, and Salboni) were constituted. The size of the project team was 48. The total strength of ERP team was reduced from 48 to 5 by the end of June 2006. Mysore ERP work was managed by these five members. In Salboni data was not being entered into the ERP system directly due to absence of trained personnel.

Inappropriate management of trained ERP core team resulted in non-utilisation of ERP systems. This indicated lack of a coherent IT strategy.

The Management stated (September 2007) that once all the issues were resolved by the consultants and ERP was made online, trained ERP core team members would be once again assigned with ERP work and skeletal manpower would be maintained in managing and maintaining the ERP software and for day to day technical issues.

Reply is not acceptable as the main objective of establishment of core team was to ensure proper implementation of ERP system and to resolve all the related issues.

4.7.1.3 Inconsistency in 'Go live' certification

'Go live' was a major milestone that culminates the effort put into the implementation. Successful completion of this milestone concluded the phase of project implementation. As per the agreement the system would 'Go live' by 2 April 2002. The 'Go Live' signoff was, however, given in May 2004. After the date of 'Go live', the Management of both the printing units reported (July 2004) that the system was not user friendly and most of the reports from ERP could not be generated. The application was not tested before being put to use. Thus, the expected due professional care had not been exercised by the Management while signing off the 'Go live'.

The Management stated (September 2007) that 'Go-live' was declared with an understanding that M/s Systime shall complete all the pending issues within a period of three months. The reply confirms the fact that 'Go live' was given before successful implementation of the system and even after three years from 'Go live' the Company was yet to stabilise and fully use the ERP system.

4.7.1.4 Non-utilisation of ERP system

The Company envisaged (1999) high level of automation of the business processes and sophisticated document management through a paperless office within a time frame of two years. Although the Company signed off the project on 'Go live' in May 2004, ERP project had not been able to give the desired results and the system did not meet the envisaged objective of ERP system to serve as an executive information and decision support system remained unachieved even after investment of Rs.13.98 crore. Re-engineering plan to assess gaps did not yield the desired results. Hence, the user did not have the confidence in using the system for their day-to-day functioning. As a result, the Company continued to depend on various other application softwares like Tally, MS Excel etc., for its day-to-day operations.

4.7.1.5 Non-accrual of business process re-engineering benefits

The Company while making a business case for implementing Business Process Re-engineering (BPR) projected a benefit of Rs.18 crore *per annum*. This benefit was to flow mainly from inventory optimisation by reduction in inventory carrying cost of Rs.5.35 crore *per annum* and increase in sales revenue of the order to the tune of Rs.13.03 crore resulting in net profit of Rs.1.30 crore annually.

It was observed during the last six years i.e., from 2001-02 to 2006-07 the inventory carrying cost ranged from Rs.3.06 crore to Rs.15.36 crore and there was no appreciable reduction in the same. It was also observed that sales during the period stagnated at the level of Rs.600 crore except for 2003-04 (Rs.813 crore) and 2006-07 (Rs.976 crore). Considering the delays and non implementation of ERP till July 2007, though the 'Go live' was given in May 2004, the Company could not get the expected benefits.

The Management stated (September 2007) that cost benefits envisaged in BPR exercises need not be an ERP post implementation cost benefit and most of the cost benefits were already achieved. Reply of the Management is not acceptable in view of the above said facts.

4.7.1.6 System deficiency

To ensure that the system processes give the expected output, correct system design and mapping of business rules is required. Any deficiency in system design would lead to incorrect out put and affect the data integrity. It was observed that

(i) Due to faulty system design, the details including value of rejections on supplies after inspection were added to the items in the POs and resulting in incorrect MIS in respect of such POs.

(ii) The printed outputs contained references to amendments even though there were no amendments when POs were reprinted.

(iii) While issuing the Water Marked Papers (WMP) from Air Conditioned (AC) stores to offset sections the issue cost did not include the cost of AC Stores. The expenditure incurred on the stores needed to be captured and allocated to materials.

(iv) The costs of manufacturing in the various stages of Work in Progress (WIP) were not being captured and as such the system could not generate the cost of finished bank notes. This also deprived the Company from monitoring and analysing the costs for controlling them at each stage of manufacturing which were vital for fixing the cost of bank notes and valuation of inventory for preparation of financial results.

The Management stated (September 2007) that they did not intend to capture on- line WIP valuation and at present WIP valuation is done manually after considering various components. However, the Management did not give any reasons for its decision. . This decision of the Management did not allow the Company to monitor and analyse the relevant costs at each stage of manufacturing which were vital for fixing the cost of bank notes and valuation of inventory for preparation of financial results. Thus the non mapping important elements like WIP valuation in the system and continued dependence of manual system defeated the objective of achieving high level of automation of the business processes through ERP project as envisaged in Corporate Information Technology Plan (1999).

4.7. 2 Application controls

4.7.2.1 Input and validation controls

Input and validation controls ensure that the data captured for processing are genuine, complete, accurate, properly authorised and entered in time and without duplication. A review revealed that the data was incomplete and not reliable due to the absence of input and validation controls.

Input controls

(i) Inventory had been classified as 'C' in respect of 1967 items out of 29248 items as per the ABC analysis and there were no items classified as 'A' or 'B'.

(ii) The lead time in respect of machine spares was indicated as 'zero'

(iii) Negative closing balances ranged from 7.5 Kg to 6240 Kg in respect of various types of inks in Mysore Unit at the end of 31 March 2007 indicating excess issue. Even though the Priced Stores Ledger showed positive closing balance, in cardex they remained as negative balances. The Management stated (September 2007) that there were no negative balance of materials as indicated in item ledger report. Reply is not acceptable as the item ledger showed excess issue/negative balance due to non-capturing of opening balances.

(iv) The system allowed capturing of the transactions relating to previous accounting year in the subsequent accounting year. It was evident from the fact that 5745 out of 5752 transactions of Salboni unit transacted on 31 March 2007 were entered into the data base in 2007-08. This discrepancy was also noticed in Mysore cardex for the year 2005-06 and 2006-07.

(v) On a sample check of data relating to delivery schedule it was noticed that specifying critical dates like the request date and the promised delivery date was not mandatory in the system. In cases where these dates were not fed in separately, the application by default picked the date of purchase order as the date of request and promised delivery date resulting in inaccuracies in data.

(vi) The status of work orders had not been captured for 63 work orders. Out of this 24 work orders pertained to 2004 and the ordered quantity in respect of 5 work orders had been delivered completely.

(vii) In respect of 14 work orders the requested quantity was not captured though the completed quantity was 221 crore bank notes.

(viii) In respect of 57 work orders the details of quantity drawn against the work orders had not been captured though completed quantity was 1911 crore bank notes.

Validation controls

(ix) The unit cost of one item (Intaglio Blanket) in Mysore unit as on 31 March 2007 was indicated as per cardex at Rs.70,554.07 whereas the Company has accounted it at Rs.4,865.576.

(x) In 520 cases, 335 crore bank notes worth Rs.447 crore had been shown as shipped even though dates cancelling the orders had been captured against order cancellation.

(xi) Starting dates of work were earlier to order date in respect of 30 work orders.

4.7.3 IT security policy

The ERP system had gone live with effect from May 2004 and become operational. Company was handling very sensitive and valuable work of printing of currency notes. Therefore, secrecy of information handled by the Company was of national importance.

It was seen that on line data transfer from other units to the Mysore unit for further processing through the leased line was not encrypted and validated with digital signature. The Company was yet to have a documented IT security policy.

The Management stated (September 2007) that leased line was being used by closed user group members and necessary firewalls were provided at Mysore to protect data servers. It is reiterated that even in closed user groups, encryption is advisable to prevent unauthorised access.

4.7.4 Business continuity plan

It was noticed that the Company was yet to formulate a business continuity plan outlining the action to be taken in the event of a disaster so as to ensure that the information processing capability was restored at the earliest. It was also noticed that there was no offsite storage location and the backup taken at Mysore was retained at server room itself. Further, there were no records/logs to ensure that the back up files were tested to ensure their integrity.

4.7.5. Other points of interest

4.7.5.1 Differences in valuation of inventory

WMP is a major raw material for manufacture of banknotes and constituted roughly two third of the consumption cost. It was observed that in the distribution module of ERP, inventory valuation was done on receipt of material as per the rates mentioned in PO. Subsequently on receipt of bills from the supplier or on receipt of actual payment details from corporate office the difference in value of inventory was adjusted in the inventory accounts of Distribution Module as detailed below:

- The value of inventory stood amended (with difference in value) though the items had not been issued as on date.

- The difference in value of the inventory was adjusted through inventory adjustment account and treated as expenditure, if the item had been totally issued on such date.
- If part quantity was available in inventory as un-issued the difference in value was added to the un-issued quantity available in stores.

It was also noticed that the inventory was valued as per the actual bill during preparation of accounts through some other software. Due to the different procedures followed while valuing inventory, differences in valuation of inventory with respect to the accounts were noticed i.e., value for four denominations were higher by Rs.53.87 lakh and value for two denominations were lesser by Rs.21.78 lakh.

The Management stated (September 2007) that this would not affect the material moved out from General stores and question of matching the value as per Distribution module and accounts did not arise. Reply of the Company confirmed the incorrect valuation of inventories in ERP system.

4*.7.5.2 Non-utilisation of programmable logic control interface of manufacturing module*

Initially it was planned to capture and utilise data items like number of printing sheets fed, sheets delivered, and discrepancy, generated from printing and finishing machines through Programmable Logic Control (PLC) interface for MIS and Accounts. It was also planned to extend the machine monitoring system to remote location. Accordingly, the PLC project interface was supplied and installed at a cost of Rs.90 lakh in May 2004. However, this facility was not being utilised due to incomplete development of manufacturing module. Thus the investment made on PLC interface remained idle and objective of having on line integration of all electronic systems (printing machines) along with real time data transfer had not been achieved.

4.8 Conclusion

The Company, which decided to implement ERP solution, a state of art technology towards its IT reengineering efforts and made investments with the objective of having organised information on-line, failed to get full benefits of the systems. This was a result of deficiencies in business process analysis, heavy customisation, lack of input controls and validation checks, maintenance of incomplete data, non-utilisation of various features, and transfer of IT trained personnel to other functional areas and lack of monitoring, training and communication of Company's vision to all the levels of the organisation. ERP was not utilised to its full potential even after a lapse of three years of 'Go live'. Consequently the computerisation of the Company remained *ad hoc* and failed to yield the expected results. As such attempts made by the Company for integrated software at a cost of Rs.15.27 crore failed to achieve the intended objectives.

4.9 Recommendations

In order to optimise the use of and benefits from the investment made on ERP the Company should:

- Address the system deficiencies and necessary modification to the software may be made with reference to input controls, validation checks.

- Prepare an IT security policy and provide for the transmission of data between units and ensure that it is carried out in a secure manner through use of encryption and digital signatures.
- Prepare a business continuity plan and keep the back up in a location separate from the server.
- Complete the ERP in a time-bound manner.
- Ensure timely capture of data through prompt internal control procedures.
- Organise regular training programs to raise the level of user awareness for effective and optimal use of the programme.
- Ensure that appropriate human resource particularly at lower and middle management levels are staffed for effective and timely implementation of the ERP.

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