REPORT OF THE

COMMITTEE ON TECHNOLOGY ISSUES

RELATING TO

PAYMENTS SYSTEM, CHEQUE CLEARING AND SECURITIES SETTLEMENT IN THE BANKING INDUSTRY

RESERVE BANK OF INDIA

BOMBAY - 400 023

DECEMBER 1994

REPORT OF THE

COMMITTEE ON TECHNOLOGY ISSUES

RELATING TO

PAYMENTS SYSTEM, CHEQUE CLEARING AND SECURITIES SETTLEMENT IN THE BANKING INDUSTRY

RESERVE BANK OF INDIA

BOMBAY - 400 023

DECEMBER 1994

Copies can be had from
The Director DRRP (Sales Section)
Department of Economic Analysis & Policy
Reserve Bank of India
Publications Division
Amar Building
P.M. Road
Bombay-400 001
India.

Price Rs.50/- (inclusive of postage)
U.S. $ 20 (By Registered Air Mail)

The Report is also available on floppy (Rs.100/-) at the
Department of Information Technology,
Reserve Bank of India,
14th Floor, Central Office Building,
Bombay - 400 023
India.

Index

Annexures

1. Introduction

1.1 The Indian financial sector is now in the fourth year of structural changes and reforms. The process of liberalisation of the economy has opened up new opportunities. In response, a number of new financial institutions are coming up and the existing ones are diversifying their functions. The role of the banks is also undergoing major changes. Banks have to face stiff competition from other intermediaries. They can no longer afford to neglect the customer service, or technology upgradation so vital for efficiency, image and growth.

1.2 Traditionally, the banking system is the established medium of settlement of economic transactions. In fact, the payment and settlement system holds the key for efficient economic activity. A sluggish payment system acts as a limiting factor in an economy, which otherwise has potential for rapid growth. More specifically, it comes in the way of growth of capital market activity, trading and other market operations. It is therefore necessary that in a growing economy, the payment and settlement systems are improved and updated to subserve their role. The nature and type of processes, involved in these systems are such that the computer and communication technologies can be adopted with great advantage in terms of efficiency and speed.

1.3 Against this backdrop, the Reserve Bank of India appointed in June 1994 a Committee on Technology Issues relating to Payments System, Cheque Clearing and Securities Settlement in the Banking Industry. The Committee is required to undertake a critical review of the existing procedures and practices relating to transfer of funds, payments system and settlement procedures, cheque clearing and the related work flow. The committee is also required to

make recommendations containing action-oriented, step-by-step solutions on the different items, keeping the long-term perspective of widening the use of modern technology in the banking industry.

1.4 *The composition of the Committee is as follows* :-

1.	**Shri W.S. Saraf** Executive Director, Reserve Bank of India, Bombay.	Chairman
2.	**Shri R. Narasimhan,** Deputy Managing Director, State Bank of India, Bombay.	Member
3.	**Shri Dinesh Nayak,** Executive Director, Indian Bank, Madras.	Member
4.	**Shri Biswajit Choudhuri,** Executive Director, UCO Bank, Calcutta.	Member
5.	**Shri B.S. Sharma,** Chief Accountant, Department of Government & Bank Accounts, Reserve Bank of India, Bombay.	Member

6.	**Shri C.K. Bapiraju,** Adviser Management Services Dept. Reserve Bank of India, Bombay.	Member
7.	**Shri A.K. Bakhshy,** Secretary and Chief Executive Officer. Indian Banks Association. Bombay.	Member
8.	**Prof. S.M. Padwal,** National Institute of Bank Management, Pune.	Member
9.	**Prof. D.B. Phatak,** Department of Computer Science & Engineering, Indian Institute of Technology, Bombay.	Member
10.	**Dr. K.K. Bajaj,** Senior Technical Director, National Informatics Centre, New Delhi.	Member
11.	**Shri Bharat Desai,** Senior Manager, National Centre for Software Technology, Bombay.	Member

12. **Shri Arvind Sharma,** — Member
Chief Executive Officer,
UTI Investor Services Ltd.,
Bombay.

13. **Smt. Rama Anantha Krishnan** — Member Secretary
Director,
DESACS
Reserve Bank of India,
Bombay.

Terms of Reference

1.5 The terms of reference of the Committee were :

1. To review the remittance facilities available to bank customers and propose new procedures for quicker service.

2. To propose screen-based reporting of transactions in the government securities to the major public debt offices for SGL operations.

3. To review the existing procedure of the reporting of government transactions by bank branches to their link offices and the RBI and propose computer-based reporting in a time bound manner.

4. To propose the use of computer and communication technology for daily reporting of currency chest transactions by chest branches to link offices/RBI.

5. To review the MICR cheque clearing procedures at the four metropolitan centers and to suggest solutions for back-up arrangements, work decentralisation, etc.

6. To provide upgradation of cheque clearing operations at other centers (other than the four metropolitan centers) and strategies therefor.

7. To review the **SWIFT** operations and suggest steps for expansion of its access.

8. To propose steps for further extensive uses of **BANKNET**.

9. To draw up training strategy in computer and communication technology for banks personnel and its implementation in various bank colleges and institutes.

10. To propose a reporting system between banks and the **RBI**, based on computer-communication network.

11. Any other issues relating to technology upgradation in the banking industry.

Committee meetings

1.6 The Committee held four meetings during its term. The first meeting was held on 18th June 1994 at Reserve Bank of India, Bombay. In this meeting the Committee decided upon the broad strategy of action. In the subsequent meetings the reports of the sub-committees were presented and after thorough discussions. the Committee's views were crystallised.

Sub-committees

1.7 Three sub-committees were constituted to go into the following specific areas:

Remittance facilities and Communications network.

Reporting of Government transactions and Currency chest operations.

Cheque clearing system.

Each sub-committee was headed by a member of the Committee. *Shri R.Narasimhan* was the Chairman of the Sub- committee on Reporting of Government transactions and Currency chest operations. *Shri Dinesh Nayak* chaired the Sub-committee on Remittance facilities and Communications network. *Shri A.K. Bakhshy* was the Chairman of the Sub-committee on Cheque clearing system. The list of members of the Sub-committees and their major recommendations are given at Annexures I, II and III respectively.

Study visits and interaction with experts

1.8 The Committee had the benefit of interaction with the members of the clearing houses at Bombay, Calcutta and Madras where MICR clearing is in operation and at Pune and Hyderabad where the sorting of cheques is done manually. Meetings with the senior bankers were also organised at these centres. The feedback provided by the participating banks were useful in formulating the cheque clearing strategies.

1.9 The Committee interacted with several organisations who made presentations or held discussions on their products, technologies . Annexure - IV gives a list of such agencies.

Format of the Report

1.10 The Report consists of 14 Chapters, including the introductory chapter and the Summary of Recommendations. The setting up of an Electronic Funds Transfer (EFT) system for

remittances has been described in Chapter 2. The next chapter discusses the settlement of transactions in government securities in a Delivery versus Payment (DVP) mode and screen-based reporting thereof. Chapter 4 recommends a network-based reporting system for currency chest operations. A similar approach is sought to be adopted for the reporting of government transactions (Chapter 5).

Chapters 6, 7 and 8 deal comprehensively with the various facets of the cheque clearing system and the measures for bringing about a reduction in the paper based instruments in the clearing operations.

Chapter 9 envisages improvement and upgradation of the existing BANKNET network to make it more useful as a communications channel for message/file transmission between banks/branches. Chapter 10 deals with the need to ensure efficient usage of the SWIFT network. The promotion of credit cards and their variants are dealt with, in the next chapter. Training strategies for upgradation of IT skills are examined in Chapter 12. The following chapter contains the Committee's views on the strategy for implementation. The last chapter contains a Summary of Recommendations.

Acknowledgments

1.11 The Committee is thankful to *Shri R.Narasimhan*, *Shri Dinesh Nayak* and *Shri A.K.Bakhshy* for their contribution as the Chairmen of the Sub- committees and the valuable reports brought out under their guidance. The Committee also thanks the members of the Sub-committees for their active participation.

1.12 The State Bank of India Institute for Communication and Management (SBIICM), Hyderabad hosted the 2nd meeting of the Committee. The Indian Banks' Association hosted the 3rd meeting at Bombay while the National Institute of Bank

Management (NIBM), Pune hosted the 4th meeting. The Committee gratefully acknowledges their whole hearted support in holding the meetings. The Committee is also thankful to UCO Bank for organising a meeting with the senior bankers at Calcutta.

1.13 Approach papers were submitted to the committee. *Prof.S.M.Padwal*, NIBM Pune, *Dr.T.N.Srivastava*, Core Faculty, Bankers' Training College Bombay, *Shri J.D.Mohile*, Director, SBIICM, *Shri A.S.Ramasastri*, Faculty member, Reserve Bank Staff College, Madras had submitted papers on Training Strategy. The Committee is thankful to them for their contribution. The Committee also acknowledges the contributions/suggestions received from many Managers, Heads of Departments and Senior Officers from the **RBI** and other institutions.

1.14 During the course of deliberations, the Committee had the opportunity to interact with several representatives from the Information Technology industry at various levels - through correspondence, informal meetings and presentations to Sub-committees/ Committee . The reports thus received were useful in working out the strategies on the relevant areas. The Committee gratefully acknowledges their contribution.

1.15 The Secretarial support was provided by the Management Services Department (MSD), **RBI**. The Committee wishes to record its special appreciation and thanks to *Shri A.P.Hota*, Asst.Adviser, MSD who worked hard in organising the meetings and preparing the draft chapters of the Report. He had participated in all the meetings of the Committee/Sub-committees as a member of the secretariat and provided valuable inputs. Thanks are also due to *Shri P.M. Thakur*, Staff Officer, *Smt.B.U.Krishnan*, Staff Officer (since retired), *Smt.T.Mathews* and *Smt.R.P.Kartha*- both stenographers, *Smt. Lakshmi Ramamurthy*, typist, *Shri M.P.Mehta*, Special Assistant and *Shri B.G. Chavan*, Duftry who had assisted

the Committee. *Kum. Nilima Ramteke*, Research Officer and *Shri P.G. Pawar* from DESACS provided invaluable support in preparing the Report and deserve fulsome praise. The Committee is also thankful to *Shri A.D. Nadkarni*, Officer-in-Charge and *Shri Murari Swarup*, Deputy Adviser, MSD for their support and guidance to the secretarial team.

1.16 The Committee thanks *Shri Bharat Desai* and *Shri G.Venkataraman* of National Centre for Software Technology for helping with text processing of the entire Report.

1.17 The Committee desires to record its special appreciation of the services rendered by *Smt. Rama Anantha Krishnan*, Member Secretary. It was indeed a commendable job to wade through the large volume of the approach papers, proposals, technical reports and newsletters and prepare the background material for the Committee.

2. Remittance Facilities to Bank Customers

Modes of Remittance

2.1 The banking system in India has yet to cover a lot of ground with regard to setting up a quick and satisfactory system for facilitating transfer of funds between centres. Presently, the major fund transfer facilities available to bank customers are demand draft, telegraphic transfer and mail transfer. Amongst these, barring telegraphic transfer, the other two modes of funds transfer are paper based.

Demand Draft

2.2 By far the Demand Draft (DD) is the most prevalent form of remittance. It is a payment instrument issued by a bank branch to its customer in favour of the specified beneficiary and payable at a branch of the bank at another centre. The customer receives the DD from the issuing branch in exchange of due payment and arranges to send it (DD) to the beneficiary. If the beneficiary has an account with the branch where the instrument is payable, he gets the payment on presentation. Otherwise, the same is collected through local clearing.

2.3 In this process the remitter himself sends the instrument to the beneficiary and they may not bank with the branches of the same bank. However, due to the physical transit of the paper instrument, certain time is taken in collection of the DD proceeds and there is also a risk of loss of the instrument. The banks have also to undertake the reconciliation work with its attendant problems.

Telegraphic Transfer

2.4 Telegraphic transfer (TT) is an order issued by a bank branch telegraphically or by telex to an outstation branch of the same bank for payment of funds to a specified beneficiary. A check signal system is used to protect sensitive particulars of the fund transfer message. Value dating is done normally within 24 hours. Almost all banks provide this service. Some banks have installed teleprinter/computerised telex networks for the purpose of linking the important branches.

2.5 The TT is an improvement over the DD as it eliminates delay and ensures prompt payment. However, its efficacy is reduced if the remitter and the beneficiary do not maintain accounts with the same bank. In such cases, usually a local pay order is issued to the beneficiary by the TT receiving branch of the originating bank and the same is collected through clearing by the beneficiary's bank. The remittance charges are higher than those for demand drafts and therefore the bank customers avail of TT's mainly for fund transfers of an urgent nature.

Mail Transfer

2.6 The Mail transfer (MT) is, like the TT, an order sent by a bank to its outstation branch requiring the latter to credit the account of the specified account holder. But in this case the order is sent by normal postal channel and hence the remittance is slow. Thus the remitter saves on telegraphic charges but the time taken for realisation of proceeds by the beneficiary at the outstation centres is much higher, resulting in invisible costs.

2.7 In all the above three modes, it is essential that the remitting bank has a branch or has a correspondent relationship with another bank at the destination centre. The whole procedure is `intra-bank-oriented' and does not meet the standard of quick service especially in the case of MTs and DDs. They

also involve avoidable manual work on document processing at both the ends with attendant possibility of transcription errors. The payment is made by the remitters at the time of originating a fund transfer and the funds remain with the issuing banks till paid to the beneficiaries. The paper-based modes of remittances also generate inter-branch accounting and reconciliation work.

Need for a Nation-wide Electronic Funds Transfer (EFT) System

2.8 In order to speed up the remittance procedures, banks have taken several steps such as computerisation of draft issuance desk, introduction of bank orders of specified denominations and dispensing with the system of verifying the advice before payment. But changes of this nature are at best procedural and do not take advantage of modern technology. The Committee is of the view that a fundamental change is required. An Electronic Funds Transfer (EFT) system which would reduce time lag in funds transfer, eliminate the drudgery of monotonous and error prone paper work, and simultaneously permit inter-bank fund settlement should be introduced. The Indian banking system with its considerable breadth and depth should be able to operate such a system.

Recommendations

Setting up of an Electronic Funds Transfer System

2.9 An Electronic Funds Transfer system on a national scale needs to be designed with vision and pragmatism. Initially it may cover the metro centres, and thereafter may be extended to other centres in a time-bound manner.

BANKNET to be the main carrier

2.10 The Committee deliberated on the need for a nation-wide Electronic Funds Transfer Network and concluded that the BANKNET communications network in its improved and more versatile form as envisioned by the Committee, would be the ideal solution to link different centres. Presently, the BANKNET covers 7 cities and as such these centres are readily available for introducing the Electronic Funds Transfer system.

Inter-bank Fund Settlement through RBI

2.11 RBI's Remittance Facilities Scheme can be suitably modified to facilitate inter-bank fund settlement at the originating as well as at the destination centres. This service can also include inter centre electronic funds transfers between banks/branches. A process flow diagram is given at the end of this chapter.

A Hybrid System of Message Transmission

2.12 Electronic Funds Transfer between two centres is generally taken to mean funds transfer in real time mode. This presupposes that all bank offices at the designated centres are hooked to a network and that funds transfer messages are received/sent by the bank offices at any desired time during the working hours. The ground realities are however different. Not all offices have the equipment and capability to undertake such communication- based operation. Further, the cost of the retail transfers could become prohibitive for the ordinary individual customers. As these funds transfers will involve debits/credits in the accounts of the respective banks, it will be difficult to monitor the balances position of bank accounts, unless the Deposit Accounts Departments at the RBI Offices are fully computerised. The Committee therefore recommends that without losing sight of the ultimate goal of

setting up an Electronic Funds Transfer System on real time basis, a scheme may be introduced on the following lines:

a) Institutional funds transfers involving amounts above Rs.10 million may be communicated by branches which are equipped to handle such communications on individual basis, to the local clearing bank, at any time during the working hours. The clearing bank would batch such requests and transmit the same to the respective destination centres at hourly intervals. Such fund transfers will, however, be effected only if there are adequate balances in the current accounts of the sending banks, with the RBI (or clearing bank).

b) Retail funds transfers for individual customers would be handled by consolidating the messages received during the day by all the branches and processing them in a single lot. Branches may send the funds transfer messages to their service branches in paper format and from service branches, the data can flow electronically either as encrypted floppy files or as direct input in a *secure* form to the computer system at the local clearing house. Likewise, at the destination centre, the clearing house can send the credit messages electronically in a *secure* form (*or in encrypted floppy files*) to the service branches and from the service branches, the credit advices can be sent to the ultimate paying banks in paper format. In short, the funds transfer system would be operated as follows:

message flow would be partly on paper and partly on electronic media

messages would be transmitted in batches

the service branch of a bank would act as the nodal point for the bank for handling its messages.

The service branch would prepare the outward messages for all its branches. In the case of inward messages, it would be responsible for receiving the messages from the clearing house and for generating the individual credit advices for each branch.

Processing of Outward Messages at the Originating Centre

2.13 To facilitate processing of fund transfer requests emanating from all the bank branches on the same day, the clearing house may prescribe a suitable cut-off time for receiving funds transfer advices from service branches which in turn may also prescribe suitable cut-off timings for the ultimate branches. Clearing Houses at the originating and at the destination centres would operate at late evening hours. The funds transfer messages received at the clearing centre upto the cut-off hour, would be consolidated in respect of each originating bank so as to arrive at the figures to be debited to the respective current accounts. The messages will also be classified and consolidated according to the destination centres and further bank-wise within each destination centre. Such consolidation would enable the clearing house to arrive at the figures to be credited to the current accounts of the paying banks at each destination centre. The detailed data files, giving full particulars of beneficiaries at each destination centre would then be transmitted via the BANKNET along with advices for crediting the current accounts of the respective paying banks at the RBI.

Processing of Inward Messages at the Destination Centre

2.14 The Clearing House at the destination centre would receive the inward messages and generate the required output files for the destination banks and transmit these files through BANKNET to the respective service branches. The latter

would generate branch- wise and account-wise credit reports giving the full details of the remittances. These credit reports would be sent to the branches for affording credit to the beneficiaries' accounts. Thus all remittances initiated at the originating centre on Day-Zero will be credited to the beneficiaries' accounts on Day-One.

Processing of Uncredited Items

2.15 It is likely that a branch may not be able to credit some of the transactions due to inaccurate or incomplete nature of account particulars furnished by the remitting party. In such cases the branch may initiate a reverse remittance in favour of the remitter. In this case, it would be deemed as a remittance from a branch to an individual beneficiary.

Infrastructure Required for Electronic Funds Transfer

2.16 For some time now, the RBI has been pursuing with banks for implementation of a scheme called Floppy Input Clearing. For this purpose the member banks of RBI-managed clearing houses are required to install PC/AT systems at their service branches. The only additional equipment, the banks would need for operating the electronic funds transfer is modems and network connectivity with BANKNET. The software for preparation of input messages containing remittance particulars with necessary safeguards could be developed by RBI.

Extension of Coverage

2.17 Since RBI manages the clearing houses at 14 centres, and as all these centres would be taken up in the next phase of BANKNET implementation, extension of EFT to these 14 centres should not pose any problem.

2.18 Extending the EFT scheme to centres where the clearing houses are managed by SBI would require a suitable system of accounting between RBI and SBI. If remittance originates from an RBI centre with SBI as the destination centre, SBI's account at RBI would be credited at the originating centre. SBI would be required to pass on this credit to the respective beneficiary banks at the destination centre.

2.19 In the light of the recommendation by the Committee for extending the reach of BANKNET, the processing equipment at the clearing houses may be configured in such a way that they would be capable of handling the increasing volumes with ease and with adequate security.

Need for an Electronic Fund Transfer Act

2.20 In view of the fact the EFT has so far not been introduced in India, there is no Act or Legislation specifically addressed to the issue of Electronic Fund Transfer. Since the banks at the destination centres would be required to credit the accounts of their customers entirely on the basis of electronic messages received from the clearing house, the responsibility and the accountability of the concerned parties at each stage, have to be prescribed and agreed upon by the participating institutions with adequate legal backing. A beginning can be made by getting the procedural guidelines of EFT adopted by the clearing houses of the centres covered under the Scheme. It is, however, imperative to enact a suitable legislation at the earliest, along the lines of Electronic Fund Transfer Act of 1978 in USA and Data Protection Act of 1984 in UK.

Security

2.21 The introduction of EFT along the above lines implies that the clearing houses would be closely involved in processing the sensitive financial messages and arriving at the necessary settlement. Unless suitable precautions are taken, the Clearing House may prove to be a vulnerable point in the

Network. In order to preclude the scope for fraud of any kind, it has to be doubly ensured that the input files containing the funds transfer data reach RBI duly encrypted in a secure manner and that the data processing is also done under equally secure conditions. The BANKNET facilities have to be absolutely safe and dependable in order to cater to the needs of a sensitive application like Funds Transfer System. Only the authorised officials may be permitted to process the data and transmit the messages to the respective centres or the destination banks. Suitable mechanism for maintaining elaborate audit trails would have to be installed.

2.22 A system of exchange of authenticator keys may be introduced in the message transmission routine. All messages emanating from a bank should bear authenticator keys exchanged with the respective destination banks. Service branches of destination banks can authenticate the messages with reference to the keys indicated by the originating banks.

2.23 A system of Checksum Total (Check Signal) may also be introduced in the message format and validated at all the message handling points so that frauds are rendered well-nigh impossible.

Electronic Funds Transfer (EFT) System - Process Flow

Day - Zero

Funds transfer requests received at branches are sent to the service branch

Service branch prepares the funds transfer messages on PC using the application software supplied by RBI and sends the message file to the local clearing house through BANKNET

The local clearing house consolidates the messages received from all banks and thereafter sorts the file destination centre-wise. Using BANKNET, the clearing house sends the data overnight to all destination centres.

Clearing house at the destination centre receives the data at night, prepares bankwise output files and transmits them to the service branch of the respective beneficiary banks

Day - One

The service branch of the beneficiary bank generates the credit reports for the branches using the software supplied by RBI and sends the same to the branches.

The destination branches credit the beneficiaries' accounts on the basis of the credit reports supplied by their service branch. Uncredited items, if any, are transmitted back as reverse inter-bank/branch remittance quoting the original message identification number.

At the originating centre, the remitting banks' accounts are debited and at the destination centre, the beneficiary banks' accounts are credited by the banks managing the clearing houses at the respective centres.

3. Reporting of SGL Transactions in Government Securities

3.1 The Reserve Bank of India is statutorily required to manage the public debt of the Central Government and those of the State Governments in terms of individual contracts entered into. The Public Debt Act, 1944 and the Public Debt Rules, 1946 lay down the detailed procedures to be followed in this regard. The debt management includes the issue and redemption of rupee loans of all maturities, payment of interest on due dates and recording transfers of ownership of debt on account of trading or otherwise. Government loans were initially issued in the form of G.P.Notes or stock certificates. Later these were also issued in a book-entry form as credits in Subsidiary General Ledger (SGL) Accounts maintained in the Public Debt Offices (PDO) of the Reserve Bank of India. The book- entry system which is now widely known as 'Paperless' system is easier, safer and faster for transfer of ownership of a security than by moving a physical certificate from the seller to the buyer. This in turn facilitates trading. Banks, financial institutions and a few other large institutional holders of Government securities are allowed the facility of SGL accounts.

3.2 Trading transactions between SGL account holders are required to be reported to the Public Debt Offices through specified "Transfer Forms" jointly executed by the buyer and the seller of the securities. On the basis of this form, PDO promptly affords credits (to buyers) and debits (to sellers) in respect of securities in SGL accounts and also advises the account holders.

3.3 The SGL transfer form contains only the information on the face value of the specified security to be transferred from the seller's SGL account to that of the buyer. It does not have any information with regard to the pricing and mode of payment

agreed upon between the two parties. The amount to be paid for the securities by the buyer to the seller is not reported either in the SGL form or in any other manner. Thus transparency in the deal is absent.

3.4 The irregularities in the securities trading which surfaced in 1992 have amply underscored the need for a system of settlement where both the securities transfer and the corresponding funds transfer are simultaneous as well as transparent. The globalisation of the Indian economy has spurred the financial markets to a frenetic pace. This has rendered the prevailing settlement procedures in the securities trading both out-dated and inefficient. It is imperative that the Reserve Bank upgrades the settlement system to international standards, both conceptually and technologically.

3.5 Central banks all over the world are concerned about the strength of securities clearance and settlement arrangements because disturbances to settlements in the securities markets have the potential to spread to the payment system as a whole. International bodies like Group of Thirty (G-30) and Federation des Internationale des Bourses (FIBV) have developed standards for facilitating efficiency and risk management in the securities market. A major recommendation of these Groups is that **Delivery Versus Payment (DVP)** should be the basis of settling trade. Major recommendations of G-30 are given at Annexure V.

3.6 In the current system of settlement of trade in securities, the **SGL transfer form** is the pivot. The **Transfer Form** movement has limitation of speed since it is a paper document and takes time to reach the PDO. Hence it is necessary to bring in an electronic system of sending securities transfer requests which will

eliminate paper movement; and

make available all essential information to the PDO.

A screen-based reporting system of the transactions individually by the buyers and the sellers is the ultimate solution. Indeed, this is the prevailing method of settlement in many developed countries.

3.7 The risks that are manifest in a payment and settlement system are briefly as follows.

Credit risk: A trade may not settle for full value either when due or at anytime thereafter. (Also known as Principal risk). In other words, the seller of the security could deliver the securities but not receive payment or the buyer of the security could make payment but not receive delivery of the securities.

Liquidity risk: Settlement will be made, not at the appointed time, but at some unspecified time thereafter.

Operational risk: Breakdown of the physical system due to hardware, software, communication system or other external factors.

Replacement cost risk: This may follow credit risk management. In the event of a transaction failing to take place, the buyer's funds may be protected and the seller's securities may also be protected. However, one or both the parties may suffer because subsequent profitable deals may not be put through .

Systemic Risk: If Parties are exposed to Principal risk, a default by one of the parties to the transaction may in turn set in motion a series of defaults. This could happen if there is a delay in the settlement of the transaction leading to wider failure rate due to snowballing - in short, systemic failure.

3.8 The DVP system ensures that the risks are eliminated to a large extent. There are divergent views about the type of settlement systems that could be considered to achieve DVP.

The Committee on Payment and Settlement Systems (CPSS) of the G-10 Countries has identified three common structural approaches or Models for achieving DVP. They are as follows:

Model 1: Both securities and funds are settled on a gross basis (trade by trade) with the unconditional transfer of the securities from the seller to the buyer (delivery), occurring at the same time as the irrevocable transfer of funds from the buyer to the seller (payment).

Model 2: Securities are settled on a gross basis, the delivery occurring throughout the processing cycle; but funds are settled on a net basis at the end of the cycle.

Model 3: Both Securities and funds are settled on a net basis at the end of the cycle.

3.9 Model 1 system totally eliminates principal risk but may involve high **fail** rates. This may consequently involve **liquidity** risk and **replacement cost risk** to participants and may also adversely affect the liquidity of the market.

Model 2 system exposes sellers to substantial principal risk as the securities are transferred prior to receipt of payments.

In Model 3 system, principal risk is avoided. However, unsettled transactions at the end of the processing cycle may lead to messy **unwinding** which can be quite complicated.

Recommendations

Revision of Public Debt Act and Public Debt Rules

3.10 In the existing SGL System, the buyer's and the seller's accounts in Securities at the PDO are duly credited or debited based on the **Transfer Form**. Payment in respect of the

transaction is presumed to have been decided as per the mutual arrangement, agreed between the parties. In effect, it is only a Delivery system. This settlement procedure exposes the parties to **Principal risks**, because a transaction may fail to materialise due to insufficient balances in the seller's SGL account or some technical reasons and it is possible that underlying funds might have changed hands. It is therefore, necessary to introduce a **Delivery Vs. Payment System**, to eliminate risks to the parties. As an immediate solution, the existing Transfer Form may be modified to provide for recording the information on fund settlement. This requires amendments to Public Debt Act 1944 and Public Debt Rules 1946 to provide for the following:

Empowering the RBI to link the transfer of securities to the underlying payment. Under the existing rules RBI is obliged to effect a transfer of ownership of securities when the prescribed SGL Transfer Form duly completed in all respects by the buyer and the seller of securities is received and the Bank is not concerned with the fund settlement.

The legal framework necessary to protect the interest of the buyer, the seller and the settlement agency.

The determination of the finality of the transaction with reference to the seller, the buyer and the settlement. regarding both funds transfer and securities transfer.

3.11 Presently a Transfer Form is jointly signed by both the seller and the buyer of securities, in the presence of witnesses. In modification, the Transfer Form may be replaced by suitable electronic system of screen-based reporting of trade by the seller and the buyer individually. RBI should be empowered to act on the strength of the electronic messages received on the computer screen individually from the buyer and the seller, after they are duly matched.

3.12 RBI may make a comprehensive review of all the legal issues relating to introduction of computerised book keeping, DVP system and screen based settlement at the earliest. RBI may propose necessary amendments to various acts such as Bankers' Books Evidence Act 1891, Public Debt Act 1944, Public Debt Rules 1946, The Indian Contract Act 1872 etc.

SGL facility to be linked to Current Account Facility

3.13 The present SGL system includes several account holders like Trusts and Pension Funds which do not have current account facility at the RBI. Under the DVP System, the payment by the buyer to the seller will have to be settled through the current account maintained with RBI. However, as stated, not all the SGL account holders enjoy current account facility with the Reserve Bank. Some of them may not be willing to maintain a current account with RBI. Hence all such SGL Account holders, the present ones as well as the new aspirants who might like to trade in the Government Securities, will have to be provided with an alternative means for settlement of trading, under DVP procedure. There are also many corporate bodies who invest in Government securities through their banks. Their holdings are not individually reflected in the RBI's books but are grouped under a separate constituent account maintained at the RBI in the name of the respective banks who buy, sell, or transfer the securities on behalf of their clients.

Setting up of Clearing Banks for SGL Facility

3.14 The Committee deliberated on these issues and proposed that a DVP system may be set up in the RBI in respect of trading in Government securities by SGL account holders. While banks, all India financial institutions and selected mutual Funds may be permitted to maintain SGL accounts in the RBI, other participants may be provided a similar facility (of

SGL accounts) in a few selected banks which may be designated as **Clearing Banks**. The guiding principle in allowing the SGL account facility at the RBI to an entity should be the *'regulator - regulated'* relationship. Also, the entity should be an active participant in the securities market rather than simply be an investor. All other entities should come under similar SGL facility at one or the other Clearing Bank. If a transaction is between the parties having SGL accounts with the same Clearing Bank, it would not enter the RBI system. The settlement of such transactions would be done at the Clearing Bank on a DVP basis. If however, an SGL account holder in a Clearing Bank has to sell or buy from a member belonging to another Clearing Bank, such a trade would have to pass through the concerned banks' second SGL account at RBI, earmarked for operating the constituents' accounts. After RBI settles such transactions between the Clearing Banks (constituents' accounts), the banks in turn would afford the credit/debit to their constituents in their respective SGL accounts on a DVP basis. The Clearing Banks would be required to maintain a clear distinction between own operations and those on behalf of their clients. The committee recommends that the RBI may consider a prescription that a Clearing Bank may not trade with its clients.

3.15 The proposal to set up Clearing Banks for securities trading may be firmed up. The Clearing Banks have to be identified at major centres. A book entry system on DVP basis, preferably screen-based, has to be set up in these banks.

Settlement Mechanism

3.16 In the proposed DVP system, the transactions may be settled on a *Gross* (trade by trade) basis. This method ensures that delivery of the securities would occur **if and only if** the payment for the securities is also made **at the same time**. The Transfer Form may be suitably modified to include the

particulars regarding funds transfer and an authorisation from the buyer to the RBI to debit his current account for payment to the seller.

3.17 The transaction would be effected by i) debiting the seller's SGL account and crediting the buyer's SGL account for securities and ii) debiting the buyer's current account and crediting the seller's current account for funds. The parties may be suitably advised.

3.18 This method ensures that **principal risk** is totally avoided. There could be some `failed' transactions. In order to avoid this, the buyer would be required to keep his current account adequately funded throughout the settlement session.

3.19 The question of failed transactions which arise because the seller does not have sufficient balances in the required securities or the buyer does not have sufficient funds, could be minimised by following a *netting* system as against a *gross* system. However, in this system, the counter-party risk increases and so does the exposure to the settling agency. In other words,

I. Such a situation creates a position of daylight credit (exposure). During the day the party may fail and the settling agency may have to bear the liability

II. It would also mean that the buyer can avail of credit `from the system free of cost' during the day;

III. This may increase the monetary liquidity in the economy.

3.20 Hence, it is recommended that a *gross* settlement system is preferable to a *net* settlement system for funds. The system may be introduced at Bombay and extended progressively to other centres.

Screen based Reporting to be introduced

3.21 A logical progression of the above settlement system would be the Screen based Reporting for settlement. The Committee recommends that the Transfer Form be replaced by appropriate Screen formats. The buyer and the seller can independently communicate their request to buy or sell, quoting a common transaction number, by means of which RBI could link both legs of a transaction and then process the trade.

3.22 The finality of the trade (trade agreement) currently represented by the paper based Transfer Form, would then be determined by the matched screen inputs from the seller to the buyer in the PDO. The screen based system of reporting may be set up at Clearing Banks also.

3.23 In order to have screen based reporting, the SGL account holders and the RBI should be linked through a network preferably the BANKNET. The nodes should be capable of transmitting and receiving messages to/from PDO/DAD in a *secure* mode.

Service Charges

3.24 A suitable system of fees for book keeping of trade of the SGL account holders at the Clearing Banks, has to be put in place. IBA may be requested to evolve a suitable fee structure.

Software Development

3.25 RBI has to develop suitable software and set up the necessary infrastructure with adequate security and control features.

Management Information System

3.26 RBI and the Clearing Banks have to evolve suitable Management Information Systems for effective monitoring of the trade.

4. Reporting of Currency Chest Operations

Currency Chests and their Importance

4.1 One of the core central banking functions of RBI is the issue and management of currency. The transactions relating to the issue of currency notes and coins are separately accounted for in the Issue Department of the Bank. The Issue Department is liable for the aggregate value of the currency in circulation and maintains eligible assets for equivalent value. Presently there are 15 offices and 2 sub-offices of the Issue Department.

4.2 At centres where there is no Issue Department, the currency requirements are met through the Currency Chests (C/C) which are maintained at bank branches authorised by RBI. Currency chests are storage points in which stocks of new and re-issuable notes and rupee coins are stored. The bank branches with currency chests can withdraw from or deposit funds into the C/C according to the day's requirements. These transactions are required to be forthwith reported to the controlling Issue Department, where fund settlement between the banks managing the chests and the RBI, is effected by debit/credit to the local accounts held by the respective banks in RBI.

4.3 As on September 1994, there were 4013 currency chests managed by 27 public sector banks and 7 private banks. The State Bank of India handles the maximum number (1824) of currency chests. Associate banks of SBI handle 1016 currency chests and the remaining chests are handled by private banks. There are also 424 Treasury and Sub-Treasury offices maintained and operated by Government Departments. The distribution pattern is given at Annexure-VI.

The Reporting System and the Settlement Process:

4.4 As per the existing procedure, the currency chests branches report the C/C figures at the close of every business day to the controlling Issue Department of RBI through **Chest Slips** and also advise their link offices at the centre where RBI's Issue Department is located. The Chest Slips contain data on opening balance, deposits, withdrawals, transfers and closing balance. Denomination-wise data on notes and coins are also furnished to RBI by the C/C in these slips.

4.5 The link office, on the basis of the data received from currency chests, submits a daily consolidated **Link Office Statement** in respect of all currency chests under its jurisdiction furnishing chest-wise details, so as to claim settlement of accounts with RBI. The Link Office Statement, incidentally, does not contain denomination-wise details.

4.6 At the RBI, the data in respect of currency chests are thus received from two sources - directly from the currency chests and also through the link office. They are processed on the computer system. Settlement is arrived at initially on the basis of the link office statement and subsequently tallied with the currency chest slips.

4.7 The above reporting and settlement process gives rise to several reconciliation errors owing to :

Delays in receipt of statements.

Mismatch between the information reported in chest slips and that reported in link office statement.

Non-availability of denomination-wise details in link office statements.

Human intervention in transcribing and transmission of data at different stages. The system has also come under

considerable strain due to the increase in the number of chests and frequent changes in the staff handling currency chests.

4.8 The overall objective of the system of currency chest reporting is that banks may render accounts to RBI promptly and accurately and facilitate RBI to raise a debit/credit to respective banks' accounts within the stipulated time frame. Ideally, if transactions at the currency chests and fund settlement at RBI occur at the same time, the equilibrium in respect of banks' balances with RBI is maintained. If one precedes or follows the other, the banks' accounts with the RBI could not show the true position.

4.9 Faced with the dispersal of currency chests over a large geographical area leading to reporting problems on the one hand and the need to adhere to the time discipline laid down for the prompt reporting of the transactions on the other hand, banks experience considerable difficulties in reporting the transactions as per stipulations. There are also penal provisions for delayed reporting. Hence, there is an urgent need for streamlining the reporting procedure.

Recommendations

Reporting through Communications Network

4.10 With the advances in computer and communications technology it would now be possible to report the data relating to C/C transactions speedily and accurately through Network. A satellite based communication network having nodes installed at all the state capitals and district headquarters, would suit the purpose. As the currency chests are dispersed all over the country, banks have to select a Network that is robust as well as well spread out. The NICNET of National Informatics Centre which has nodes at all district

head quarters may, among other similar Networks, be considered for this purpose.

The First Phase

4.11 In the first phase all the issue offices of RBI and the district branches of banks with C/C may be equipped with a PC, modem and STD facility. These installations will be provided with 1) the communication software necessary to hook on to the node of the selected Network (Say NICNET) and 2) the application software for preparation of the C/C data file. A district level branch can thus hook on to the nearest node and transfer the data file addressing it simultaneously to the local issue office of RBI and the bank's link office. The File would, thus, travel from the district node to the RBI Issue Office and the Link Office of the reporting bank.

4.12 The district level branch could, in the event of the non-functioning of the nearest node, access any other node. Alternatively the branch could, through STD dial-up facility, directly transmit the data to the RBI and the Link Office.

4.13 The branches which are at sub-district level but have access to STD facility could also likewise transmit the files directly to RBI/link office. The requirements would be as before, a PC-AT, a modem and STD link, as also the necessary communication and application software.

4.14 The remote branches with none of the above facilities (viz. proximity to district node or STD facility or PC) may arrange to send the C/C data through telex, trunk call or courier service to the nearest district branch of their bank (ref. para 4.11) who will prepare the data files on behalf of the branch, and arrange to transmit the same through Network or STD.

The Second Phase

4.15 In the second phase, all C/C branches would be provided with a PC-AT, modem and STD facility so that they could directly report the data to RBI/link office.

4.16 Thus it may be seen that the backbone of the reporting system would be the chosen communication Network. As the currency chest branches generally happen to be the designated branches for Government transactions also, the investment in infrastructure would be fully exploited and will prove to be cost-efficient.

4.17 While establishing the Network connectivity, the issue of back-up facility may be kept in view. The district branches may also have STD facility so that in case the network fails, they may directly report to RBI and Link Office through dial up method. This is necessary because in the case of NICNET, the nodes are still operator-dependent as the Collectorate Offices which house the NICNET node close between 5.00 and 6.00 p.m. If a C/C branch has to send a message after such closing hour, it will have to send the file/message only through PSTN dialup.

4.18 The Issue Department of RBI will work out fund settlement at its Deposit Accounts Department on the basis of the data received from the currency chests and would make the details available electronically to the Link Offices before the close of business hours. The Link Offices would reconcile the figures on the basis of data received by them from their respective currency chests independently.

5. Reporting of Government Transactions

Transactions of the Central Government

5.1 The banking business of the Central Government consisting of receipts, payments, collections and remittances on their behalf are carried out by the Reserve Bank of India offices and designated public sector banks. Each Ministry/Department is responsible for maintenance of its own accounts and has been accredited to one (or more) public sector banks which looks after all the receipts and payments relating to that particular Ministry/Department.

5.2 The Chief Controller of Accounts (**CCA**) is the Principal Accounts Officer of the Ministry/Department and is responsible for consolidation of accounts of the Ministry/Department. The Pay and Accounts Officer (**PAO**) makes payments pertaining to the respective Ministry/Department. The Drawing and Disbursing Officers (**DDO**) under each PAO are also authorised to draw funds by means of cheques drawn on offices/branches of accredited public sector banks handling the receipts and payments of the Ministry/Department. All receipts and payments are finally accounted for in the books of PAO.

5.3 The dealing branches which maintain the accounts of DDOs/PAOs are ,for the purpose of reporting, linked to a Focal Point Branch (**FPB**) of the same bank (except when the number of dealing branches is less than 10) which is usually located at the same centre where the PAO is situated. The FPB also transacts Government business directly on its own like any other dealing branch. The proximity of the FPB to PAO is decided with a view to facilitating reconciliation of accounts, avoiding correspondence and working in close

coordination to ensure prompt and accurate accounting of Government transactions.

Reporting System

5.4 The dealing branch putting through the receipt and payment transactions incorporates them in the receipt and payment scroll kept separately for each account holder. Two sets of scrolls along with the relative challans and paid cheques are forwarded at the end of the day to the Focal Point Branch to which it is linked. The FPB carries out a scrutiny of the scrolls with reference to the challans and paid cheques for accuracy. The FPB thereafter consolidates the transactions of the dealing branches, including its own, in a Main Scroll, separately for each Ministry/Department. The Main Scroll, along with a copy of the receipt/payment scrolls and challans/cheques received from the dealing branches are forwarded (by the Focal Point Branch) to the Pay & Accounts Officer on a day-to-day basis. Simultaneously, the figures of aggregate receipts and payments from the Main scroll separately for each PAO are reported to the Link Cell at Nagpur through a `Daily Memo'. The figures are transmitted through telex/telegram if the net of the amount is Rs.1 lakh and above. In the case of State Bank of India branches the figures are transmitted to GAD, Worli electronically and from thereon to Link Cell at Nagpur. The Link Cell forwards the `Daily Memo' thus received from various FPBs directly to the Central Accounts Section (CAS), Nagpur for settlement. The CAS Nagpur transcribes these figures onto magnetic media for the purpose of compiling the Government position as well as for settlement. The CAS, Nagpur generates the "Put Through" statements daily and passes them on to the Link Cells for verification and confirmation. The PAO carries out a scrutiny of the Main Scrolls with the supporting challans/cheques sent by FPB and returns the duplicate copy of the Main scroll duly certified, the next day. Mistakes/discrepancies pointed out by the PAO are rectified

through "Error Scrolls" and the FPB reports the errors so adjusted to both the PAO and the Link Cell. The latter includes the adjusted figures in the subsequent day's daily memos sent to CAS, Nagpur.

Monthly Statement

5.5 The focal point branch also prepares at the end of the month, a date-wise monthly statement of the respective Ministry/Department and submits them to the concerned PAO for verification. The PAO returns two copies of the monthly statement to FPB which forwards one copy thereof to its Link Cell at Nagpur. CAS, Nagpur also generates PAO-wise, Ministry-wise monthly statements and furnishes copies thereof to Link Cell. The latter compares the monthly statements received from CAS, Nagpur with those received from FPBs and reconciles the difference, if any, through the subsequent day's daily advice.

Transactions of State Governments

5.6 The receipt and payment transactions on behalf of State Governments are handled by RBI offices (at certain centres) and agency bank branches located within the State, for which purpose they maintain the accounts of the Drawing and Disbursing Officers. The State Government accounts are kept on a partially decentralised basis. Under this system the receipt and payment transactions put through at a branch of an agency bank are reported through its Link Cell to the Public Accounts Department (PAD) of Reserve Bank of India which maintains the account of the State Government concerned. Every PAD maintains the account of the government of the State in which it is located (except in the case of PAD at Nagpur which maintains the accounts of Madhya Pradesh and the PADs at New Delhi, Guwahati and Bombay where the accounts of more than one State

Government are maintained). The Link Cell of the agency bank is located in the same centre where the PAD is located.

Reporting System

5.7 The branches report the daily aggregate figures of the receipt and payment to their Link Cell (through GAD Bombay in the case of SBI) by telegram/telex if the net amount is Rs.1 lakh or more or by postal advice in other cases. The Link Cell in turn consolidates and reports the figures State Government-wise - in the form of a daily statement to the concerned PAD for settlement. The branches simultaneously furnish copies of scrolls and documents - challans and paid cheques, to the local Treasury Officer (LTO). The concerned PAD maintains a record of `Agency Transactions Account' - separate for each State and Agency Bank - in which the figures reported every day by the Agency Bank are incorporated and held. The PAD includes these figures in their daily reporting of Government figures to CAS Nagpur.

Monthly Statements

5.8 Unlike in the case of Central Government accounts, the State Government accounts are closed on a "month-of-account basis". The PAD thus keeps open the books of `Agency Transactions A/c' of the previous month till the 15th of the subsequent month, to enable all the transactions pertaining to the previous month to be reported and accounted. During this period, the PAD maintains two months' accounts concurrently - one relating to the current month and the other relating to previous month. After all the transactions pertaining to the previous month have been reported and accounted for, the Link Cell prepares a Date- wise Monthly Statement (DMS) separately for each State Government on the 16th of the subsequent month and furnishes the same to the PAD. The PAD scrutinises the DMS with reference to the figures reported to it daily by the Link Cell. After the figures

are tallied, the PAD will transfer the previous month's balance held in the respective State Government's accounts to CAS Nagpur (on or around the 16th of the subsequent month).

Flow of data

5.9 The flow of data from the dealing branch to CAS, Nagpur is indicated below:

1. Central Government

a) Dealing Branch → Focal Point Branch → (GAD Worli in the case of State Bank of India) Link Cell → CAS Nagpur

2. State Government

a) Dealing branch → Link Cell → PAD (where the State Government accounts are maintained) → CAS Nagpur

Recommendations

Reporting through Communication Network

5.10 Fund settlement may be delinked from submission of scrolls and challans (in case of Ministries and Departments) and an electronic reporting procedure to be introduced. Under the current procedure the funds settlement with CAS, Nagpur in respect of Central Government transactions (and hence the figures getting reflected in Government Accounts) wait till the FPB is able to submit the scrolls along with the relative challans and paid cheques to the respective Pay & Accounts Officers (PAOs). The FPB has to wait for the scrolls/documents to be received from the dealing branch. Also the Focal Point Branch may take another day or two to i) scrutinise the scrolls and challans/paid cheques received from

the branches, ii) consolidate the transactions and iii) prepare the Main Scroll thereafter. Further the current instructions provide that the figures are conveyed by telegram/telex only where the net amount is Rs.1 lakh or more. The reasons for delay are many. For faster settlement of funds, the Committee is of the view that settlement should be delinked from submission of scrolls/documents. The dealing branches should report the aggregate receipts/disbursements as arrived at i) by adding the challans' amounts, and ii) by totalling up the cash/cheque amounts and the net position on communication network or dial-up facility to the Focal Point Branch at the close of the day (Day-Zero). The Focal Point Branch should report the same electronically to its link branch and also to PAO (along with the particulars of transactions) on Day-One. Link branch in turn can report electronically to CAS, Nagpur the same day. This would facilitate funds settlement of the transactions latest by the close of next working day.

5.11 Similarly, all bank branches dealing with State Government transactions should report the total receipts and payments with the net position to their State Government Link Office (SGLO) on the same day - (Day-Zero) and SGLO may report the transactions next day (Day-One) to the local Public Accounts Department of RBI. Thus for State Government transactions also funds settlement and hence the figures getting reflected in the State Government Account would be possible within 24 hours.

First Phase

5.12 Building such an electronic reporting system may be carried out in two phases. In the first phase, the Focal Point branches of banks, their Link cells at Nagpur, SGLO at the centres where PADs are located and CAS Nagpur may be linked to a common network. Further the PAD of RBI may also be connected to this network. Since NICNET of National

Informatics Centre has its nodes at all district head quarters where Focal Point branches are normally located, NICNET may be one of the networks to be considered for this purpose.

Second Phase

5.13 In the second phase, all bank branches dealing with Government transactions may be made the users of the network so that data can be reported electronically right from the transacting branch till the settling point at CAS Nagpur.

Dial-up Facility as Backup

5.14 To enable the branches of banks/offices of RBI to utilise the Network services, a PC/AT with Modem may be installed at all the user points. In case of non-availability of the Network node, connections can be established through dial-up. Therefore, STD facility may also be made available at these points.

Network Option for State Bank of India

5.15 The State Bank of India, which handles about 70% of all Government transactions has already developed a computerised reporting system (127 branches connected so far). They can slightly modify the system to achieve the objective of reporting within 24 hours. The Government Accounts Department (GAD) at Bombay may be made user of the Network through which the data can be transmitted to CAS. Nagpur direct. PC-Modem/Dial-up connections with STD facility may be used as a back-up. The Focal Point branches of SBI which are connected to GAD, Bombay by dial- up connections and those which have not been connected so far may also be made the users of Network so that the Network may be made the main connection and the PSTN connections used as a fall back facility.

Connectivity Between Link Cells of Banks and CAS, Nagpur

5.16 Once all the Link cells of banks are computerised and connected to CAS, Nagpur through the Network as well as through PSTN lines, the transactions reported by the various focal point branches of a bank can be directed as a single consolidated file from the Link cell to CAS, Nagpur with minimum processing. The Link Cell tier at Nagpur may continue for the purpose of reconciliation of Government transactions as well as funds settlement.

Specialised Treasury Branch

5.17 It is also suggested that where the turn-over of Government transactions is significantly high, the dealing/Focal Point branches may be treated as exclusive specialised treasury branch (or Government transaction branch) and fully computerised. The State Bank of India may take the lead in this regard. Banks themselves may identify these branches. The Committee is of the view that the State Bank of India may set up atleast one specialised branch at each of the centre where RBI has an Office.

5.18 The present reporting system to the Government accounting authorities may continue. Central/State Governments may also install PC/AT and Modem at their PAO/Treasury Offices so that the Focal Point Branch/reporting branch can communicate and transfer files to PAO/Treasury electronically. If PAOs also computerise their work, electronic reconciliation of monthly statements received from Focal Point branch and Link Cell, Nagpur would also be possible.

5.19 The challans and paid cheques should be forwarded by the dealing branches to the Focal Point branch on a daily basis (Day-Zero to Day-One). The Focal Point branch office exercising due scrutiny should send the consolidated Main

Scroll to PAO latest by the morning of Day-Two. By this time, the fund settlement at CAS, Nagpur would have taken place on Day-One evening. In due course of time, when all PAOs/Treasury offices are computerised, they can get electronic reports from the link cells/SGLOs and the scrolls on the same day.

5.20 Building such an electronic reporting system from end to end may take some time. The Committee recommends that the first phase be completed by June 1995 and the second phase by December 1995.

State Government Bill Payments to be replaced by Cheques

5.21 The system of payments by banks on the basis of bills is still continuing in the case of payment transactions of some State Governments. Processing of Government bills at the banks' level is not only time - consuming, but also error prone. Moreover, banks do not get the protection as available under the Negotiable Instrument Act. Therefore, the committee urges that such State Governments may be persuaded by RBI to adopt cheque payment system. Such a procedural change will bring about operational convenience at the bank level and facilitate prompt reporting of transactions.

6. Review of *MICR* Clearing at four Metropolitan Centres

Coverage of MICR Clearing

6.1 MICR clearing has been in operation at the four metropolitan centres for more than five years. It was first introduced at Bombay in March 1987 and was subsequently extended to Madras (July 1987), New Delhi (February 1988) and Calcutta (May 1989). At these centres banks are required to use standardised cheque leaves with MICR band. This also applies to Corporate customers who use dividend/interest/refund orders. The sorting and listing of cheques is carried out by the High Speed Reader Sorter systems which have been installed at the clearing houses. In view of the high cost of such reader-sorter equipment, the sorting had to be centralised at the clearing houses. On their part, banks had installed encoder machines at their end for encoding the amount particulars on the clearing instruments. Thus the system followed is one of decentralised input preparation and centralised processing.

Procedure of MICR Clearing

6.2 The member banks present the cheques at the clearing house between 5.00 p.m. and 7.30 p.m. on week days or between 2.30 p.m. and 4.00 p.m. on Saturdays. The cheques are processed in the clearing house during the night. The different stages involved in the cheque processing at the clearing house are: Prime pass, On-Line Reject Re-entry (OLRR), Adjustment and Balancing, Fine Sort, Report generation, Manual sorting of rejected instruments and Packing of sorted instruments in the respective banks' trays/receptacles. Among these the OLRR work is the most error prone, often leading to clearing differences at banks' level. Manual sorting of rejected cheques is also error prone

and time consuming. After completing the processing cycle at night, the clearing house delivers the instruments to the drawee banks in the morning.

Problem of High Reject Rate and Clearing Differences

6.3 OLRR and Manual sorting of cheques are directly related to the reject rate of the cheques in the prime pass. The rejection takes place either on account of poor pre-printing of MICR instruments by the drawee banks/corporate customers or due to the poor quality of amount encoding by the presenting banks. While internationally the reject rate is about 1%, the average reject rates at the four clearing houses are much higher at around 3.5%. At Madras and Calcutta the average reject rate is somewhat lower at 3% or less whereas at Bombay and New Delhi the rates are higher at 3.5% and 4% respectively.

Increasing Volume of Cheques

6.4 The volume of cheques processed at the four metropolitan centres during the past 3 years had registered an average growth rate of 12% per year. In the year 1991-92 the rate of growth was as high as 14%. This growth can be attributed mainly to the spurt in the number of dividend warrants and refund orders. The higher turnover in the capital market also seems to have a direct bearing on the increased volumes of cheques (cheque clearing data at Annexure VII) passing through the cheque clearing system. Understandably, the surges in the volumes tend to exert considerable strain on the resources available at the clearing houses. For instance the infrastructure at Bombay comprising reader-sorter equipment, space etc. have been created to take on a maximum load of 6 lakh instruments per day, which at the time of installation was considered adequate to cater to the perceived growth in volumes. Recent developments have

belied these calculations. For instance, at Bombay, the daily average volume of cheques in 1987 was 4.25 lakhs. In October 1994 the daily average volume was as high as 7.25 lakhs. At the other three metropolitan centres also the infrastructure laid in 1987 is now found to be inadequate. The system has started to buckle under the strain. The Committee therefore has come to the conclusion that the cheque clearing work requires to be reorganised with a different approach.

Backup Arrangement

6.5 In February 1994, the MICR cheque clearing at Bombay had to be suspended for five days due to the failure of the computer system. The failure was attributed to the aging hardware. The standby arrangement is that if at any time the clearing operations fail at one centre for more than 2 consecutive days, either the banks are required to fallback on manual sorting and listing of cheques, or the RBI makes arrangements to process the cheques at another metropolitan centre. In the February 1994 incident, arrangements were made to send the cheques from Bombay centre to the Madras Clearing House. But the experience brought into focus the risks inherent in such a move. The lifting of such a large volume of cheques from one centre to another, dilutes the control measures which are usually applied in cheque processing when the instruments are processed locally. In this exercise, several clearing differences were reported by banks pertaining to this particular clearing. Thus, there can be no second opinion regarding the need to set up back-up systems locally. There is also a systemic risk involved in the process of holding up payment systems for a length of time. The daily average value of cheques in MICR clearing being very high (Bombay 1380 crores, Delhi 300 crores, Madras 140 crores and Calcutta 130 crores), absence of an alternative arrangement for cheque processing has a potential for

systemic risk which needs to be tackled. Disaster recovery plans have to be put in place early.

Customer Service

6.6 In April 1994, a survey was conducted at Bombay with a sample of 20 bank branches, spanning varying sizes and various locations. The purpose was to find out whether all the cheques received by branches at their counters till the close of banking hours, did find place in the same day's clearing. It was observed that as many as 33% of the cheques did not make it to the clearing house on the same day. This percentage was considered rather too high to be acceptable considering the fact that banks have about four hours at their disposal till the close of banking hours to complete encoding the amount fields and present the cheques in the clearing house by about 7.00 p.m. It was further noticed that at most of the banks, encoding is centralised at the service branches. Many branches having a substantial volume of outward cheques (more than 500) did not have encoding facilities. As a result, even if such branches presented their cheques in time to the service branch, the latter on occasions, kept the work pending for a day.

Electronic Clearing Service

6.7 At the request of banks at Bombay, a separate clearing cycle has been introduced for at-par items. Since the bank branches at Bombay have been presenting the at par items in separate lots right from the inception of MICR clearing, holding a separate clearing during day time for the at par items did not pose any problem. Introduction of this clearing has brought to the fore, the advantages to be gained by substituting these paper instruments by electronic advices. A beginning has been made by envisioning a scheme called Electronic Clearing Services (ECS) - Credit Clearing. At Madras, pilot runs were conducted by offering the facility to 11 Madras based

financial institutions for making their monthly interest payments and to the Government of TamilNadu for enabling payment of salaries to their officers. At Bombay, the scheme was extended to ICICI for their yearly dividend payments on a pilot basis.

6.8 Under the above Scheme, the institutions wishing to make payments are required to submit the data through their bankers to the clearing house, giving full account particulars of their beneficiaries such as the bank branch codes, the account holders' names, account numbers and the respective amounts to be credited. The clearing house would process this data and generate bank-wise and branch- wise credit reports with full details of the accounts to be credited by the branches along with the corresponding payment details as furnished. On the appointed day, the current account of the corporate customers/bank is debited in RBI's books while those of the beneficiaries' banks are credited. The corresponding debits would be effected to the corporate customers and the credits to the individual beneficiaries by the respective banks.

6.9 The above ECS Scheme has been received quite well by the banks and the corporate institutions. Based on the experience already gathered, the Scheme is being fine-tuned and would be made widely operational soon. It is expected that this would cut down a significant portion of the issue of paper instruments in the category of dividend warrants, interest warrants and refund orders. The travails associated with paper handling at various points viz., the presenting banks, the drawee banks and the clearing house, would be substantially mitigated. The Scheme, however, needs to be vigorously promoted by the banking system.

Electronic Clearing Service(ECS) - Credit Clearing and Debit Clearing

6.10 Electronic Clearing Service (ECS) - Credit Clearing facility should be made available to all corporate bodies/ Government departments for making bulk or repetitive low value payments like interest, dividend, refund, salary, pension or commission. Since this scheme has the potential to grow into a full-fledged activity, the infrastructure and the manpower at the clearing house may be planned accordingly.

6.11 Debit Clearing may also be introduced for pre-authorised debits for payment of utility bills, insurance premia and installment's.to leasing and finance companies. A beginning may be attempted with the pre-authorised payments by the corporate customers of the utility organisations.

Utility Bill Payment System

6.12 A "Bill Payment System" may be introduced whereby the consumers/ subscribers of utility services could make their utility bill payments by approaching their own bankers instead of the designated banks of the Utility organisations as at present. The Utilities could be requested to modify the formats of their bills to contain three distinct parts, one to be returned by the bank to the consumer/subscriber as receipt of payment, the second portion to be retained at the receiving branch of the bank and the third portion to be sent to the service branch for capture of data (i.e utility organisation number, consumer/subscriber number, sort code of the banker to the utility organisation and the amount). In order to facilitate automatic data capture, the portion to be sent to the service branch is recommended to have a pre-printed MICR code line structure. Once the Scheme stabilises in respect of (say) electricity and telephone bill payments, banks may start

accepting payment of insurance premia and installment payments to financial/leasing companies etc. The concerned institutions may have to bear the necessary charges.

Clearing Bank Approach for Decentralised Cheque Processing

6.13 Clearing Bank approach should be adopted at each MICR clearing centre by restructuring the cheque processing work. Member banks of the clearing house will, at their choice, join one of the Clearing Groups headed by a clearing bank. Each Group should have its own cheque processing facilities. At Bombay, there should be a minimum of three Clearing Groups and at other centres, two Clearing Groups may be adequate for the present.

6.14 The cheque processing centres to be set up by the banks should be owned and operated by the banks themselves either individually or collectively. Since cheque clearing forms a highly sensitive and critical part of the banking system, with its ramifications in the national payment system, third party intervention in cheque processing may be avoided as it dilutes accountability. If desired, a review may be made after two or three years after setting up the necessary legal framework and supervisory system.

6.15 Cheque clearing volume of the State Bank of India is the highest at all the four metropolitan centres. The State Bank of India also manages the clearing houses at major commercial centres like Pune, Baroda and Surat. Therefore, it is in the fitness of things to recommend that the State Bank of India may be designated as a Clearing Bank at all the four metropolitan centres.

Mutual Backup by Clearing Banks

6.16 Clearing Groups will provide mutual backup to each other in the event of a disaster situation at a cheque processing site.

The configuration of the cheque processing equipment should have additional capacity and inbuilt redundancies to take care of this aspect and may be worked out accordingly.

MICR Cheques to be of Uniform Size

6.17 The Committee recommends that in the interest of operational efficiency leading to reduced reject rate, all MICR cheques may be printed in uniform size. The size of Savings Bank A/C cheques and Travellers Cheques may be increased to some extent and the size of current account cheques and other instruments decreased slightly, so that the overall cost of printing remains almost the same. RBI may, in consultation with banks and security printers, finalise the specifications.

Computerisation at the Service Branches of Banks

6.18 Banks may, at the earliest equip their Service Branches with computers (PC/ATs) and modems to enable them to present and receive the cheque clearing data (both outward and inward) on floppy/cartridge tapes and in due course, through communication links. Service branches, in turn, may supply the inward clearing data to the fully computerised branches on floppies. A few foreign banks have already started collecting inward clearing data on floppy so as to upload the data directly on their computer for updating the bank accounts. For effective utilisation of clearing house data, all branch automation software, should have a module to accept the MICR clearing data for updating the customers' account after due validation.

Scroll Number Information on MICR Codeline

6.19 MICR codeline should be modified to include an additional field to indicate the scroll number of the Outward Clearing Register of the presenting bank branches. This would enable

the quick identification of a missing instrument at any stage of processing and to reduce reconciliation problems.

Reconciliation of Clearing Differences

6.20 Clearing Differences prior to July 1994 may be frozen for dealing separately and differences arising after that date may be kept down to a minimum and resolved within a stipulated time frame. Banks may constitute Internal Task Forces for reconciling the differences prior to July 1994 within a time frame of 6 months.

Inter-bank Electronic Payment System (I-BEPS) at Bombay

6.21 At Bombay, the Deposit Accounts Department may be computerised and an Inter-bank Electronic Payment System (I-BEPS) may be set up to enable banks to initiate balance enquiry, inter-bank fund transfer and inter-centre fund remittance by on-line access to RBI's computer at Deposit Accounts Department. Fund Transfer may be on gross basis.

Cheque Truncation

6.22 Cheque Truncation System may be introduced with Intra-bank cheques of value upto Rs.5000/-. In due course, it may be extended to inter-bank instruments as well. RBI may initiate the process of bringing about suitable changes in the Negotiable Instruments Act.

7. Upgradation of Cheque Clearing at Non-metropolitan Centres

7.1 Based on the recommendations of the Working Group on Cheque Clearing System (1983), steps for introducing MICR clearing at 14 centres were initiated in 1985. The first phase of introducing MICR clearing at the 4 metropolitan centres was completed by May 1989. For the second phase, 10 centres were identified and bank branches at these centres were advised to issue all payment instruments in MICR format.

7.2 The average daily cheque volumes during a recent period (September 1994) in the 10 identified centres were as follows:

Sr. No.	Centre	Daily volume (in thousands)
1.	Ahmedabad	220
2.	Bangalore	120
3.	Hyderabad	95
4.	Baroda	90
5.	Pune	70
6.	Jaipur	45
7.	Nagpur	40
8.	Kanpur	30
9.	Tiruvananthapuram	15
10.	Guwahati	8

7.3 Since 1987, most of the banks in these 10 centres have been printing the cheques on MICR stationery. At Nagpur the percentage of MICR cheques in circulation is as high as 90%. The percentage is also quite substantial at Ahmedabad, Bangalore, Hyderabad, Pune and Baroda.

7.4 Initially while introducing the MICR clearing at Bombay and other metro centres in 1986, it was planned that the banks would sort their outward cheques bank-wise and the RBI would work out the funds settlement based on the outward cheque clearing data submitted by the banks. Therefore medium-speed reader-sorter equipment were acquired by various banks for such decentralised cheque processing. The position was subsequently reviewed and it was decided to go in for a high speed centralised cheque processing equipment at the clearing house. This approach had worked well at the metro centres and it is therefore planned to follow the same strategy at the other centres.

7.5 The cheque clearing volume at Surat is also seen to be quite high, comparable with the volumes at Pune and Baroda. Incidentally, Surat does not find a place in the list of cities recommended in 1983 by the Working Group on cheque clearing system for MICR clearing. However, in view of the fact that the present volume of cheques in Surat is much higher than many other centres identified by the Working Group for MICR clearing, it is recommended that Surat may also be included for introducing MICR clearing.

Recommendations

MICR technology to be adopted at various centres

7.6 MICR clearing may be introduced at Ahmedabad, Bangalore, Hyderabad, Pune, Baroda and Surat at the earliest. As banks at all these centres except Surat are already using MICR cheques, switching over to the new system of clearing would not require much time.

7.7 The Managers of the clearing houses at these centres, viz., the RBI at Ahmedabad, Bangalore and Hyderabad and the State

Bank of India at Pune, Baroda and Surat may install appropriate cheque processing equipment.

7.8 It may be ensured at these centres that right from the start of MICR clearing, there is an adequate back-up arrangement. The back-up installation should preferably be at a remote location from the main system.

7.9 It is essential that the Cheque processing activity be operated on a self-supporting basis. Therefore the principle of cost recovery may have to be applied.

Centres having more than 100 branches

7.10 In a subsequent phase, all centres having more than 100 bank branches may be taken up for MICR clearing. The process may begin with those centres where the banks have already started using MICR cheques i.e at Jaipur, Kanpur, Nagpur, Thiruvananthapuram and Guwahati.

7.11 As per the data available in September 1994, there are 28 centres including the four metropolitan centres and the identified centres indicated at para 7.2 (list at Annexure VIII) which have more than 100 bank branches. A schedule of implementation of MICR clearing for these centres may be drawn up. The implementation schedule may have a time frame of not more than 2 years.

Floppy Input Clearing as an interim measure

7.12 Till such time that MICR clearing is introduced at these identified centres, an interim system of Floppy Input clearing may be introduced. Under this system, the banks would prepare their input statements on floppy and submit the same to the clearing house with due safeguards to ensure authenticity and security. Whereas banks would continue to sort and list the changes as usual, the clearing house would work out the clearing settlement on the basis of the data

submitted by the banks. This would facilitate expeditious processing of clearing settlement and enable the banks which manage the clearing house, to organise "same day return clearing" or to introduce additional special clearings such as "High Value Clearing" and "Inter-bank Clearing".

Centres with more than 5 bank offices

7.13 The available data indicate that there are at present about 1,400 centres wherein more than 5 banks operate. However, clearing houses have been established only at 864 such centres. Therefore, arrangements may be made to establish clearing houses at the remaining centres through the lead banks of the respective districts.

8. Collection of Outstation Cheques

8.1 By virtue of its interaction with bankers, at a few centres viz., Bombay, Calcutta, Madras, Pune, Hyderabad and Bangalore the Committee has come to the conclusion that by and large the time taken for collection of outstation cheques is between seven days and one month. "Postal delay" was reported to be the primary contributing factor for the delay on the part of banks in crediting the customers' accounts. In order to comply with the prevailing legal provisions cheques presented at one centre have to be necessarily transported to the drawee centre and as such, the logistical problem cannot be wished away.

8.2 After the issuance of RBI's guidelines for providing credit to customers' accounts in respect of outstation cheques upto Rs.5,000/-, laying down stipulations for payment of interest for delays beyond the prescribed limit (10 working days), the position has considerably improved. Banks started introducing special schemes for speedy collection of outstation cheques. While some banks have introduced the system of sending the cheques by courier and the credit advices by telegram/telex/fax, a few others use the courier service for both the purposes. Inspite of such efforts, this is still a complaint-prone area and requires to be improved.

8.3 The inter-city clearing introduced by RBI is a step in this direction. But presently this service is limited to a few centres. There now exist three modes of inter-city clearing service as below :

I. **Two-way Inter-city Clearing**- Under this scheme, cheques received for collection at any of the four metropolitan centres, viz., Bombay, New Delhi, Calcutta and Madras and payable at any of the other three metropolitan centres are collected by

the National Clearing Cell (NCC). The presenting banks at these centres send the instruments to the local NCC which sorts and lists the instruments city-wise and sends the same by courier service to the NCCs at the respective drawee centres. The NCC at the drawee centre presents the instruments in the local clearing and after the return schedule forwards the credit notes along with the unpaid instruments, if any, to the collecting NCC by courier service who credits the banks' accounts and returns the unpaid cheques to the presenting banks. The collecting bank thereafter credits the customer's account. Time taken by the NCCs is 5 to 6 working days.

II. **One-Way Inter-city Clearing**- In this scheme, Ahmedabad, Bangalore, Hyderabad, Nagpur, Kanpur and Thiruvananthapuram centres are connected to the four metropolitan centres. Cheques received for collection at these centres and payable at the metropolitan centres are forwarded to the respective NCCs by courier. The modus-operandi is similar to the one described above. The collecting banks' current accounts are credited at the local RBI Office and the banks in turn credit the customers' accounts. Baroda centre where the clearing house is managed by the State Bank of India is also connected to the four metropolitan centres. In this case, the State Bank of India acts as the agent of all the member banks of the Baroda Bankers' Clearing House for collection of cheques drawn on the metropolitan centres.

III. **Regional Grid Clearing**- In this system, the clearing centres are connected only to the nearest metropolitan centre in one way clearing (cheques received at these centres payable at the nearest metro centre are collected through this clearing). Patna is connected to Calcutta and Jaipur to New Delhi. Twenty five of the district head-quarter centres in the state of Tamil Nadu have been connected to Madras NCC, with the State Bank of India (SBI) acting as the agent bank

both at the collecting centre and at Madras. There is scope for extension of this service to other states.

Recommendations

Use of BANKNET for sending Credit Advices in the case of RBI's Inter-city Clearing Service

8.4 In the absence of an acceptable cheque truncation system, the payment instruments have to be necessarily transported to the drawee branch. But thereafter only the information on the status of the instrument needs to be communicated by the drawee branch to the NCC at the drawee centre and from there to the respective originating centres. The collecting bankers' accounts could then be credited the very next morning and in turn, the collecting branches could be advised by the service branches. The reverse process would be initiated for returned instruments to pass on the credits to the customers' accounts. The unpaid instruments can be returned to the banks the same evening (after they are received from the courier) or the next morning.

More Centres to be covered under Two-way Inter-city Clearing

8.5 Since the centres Ahmedabad, Bangalore, Hyderabad, Nagpur, Kanpur, Jaipur, Thiruvananthapuram and Guwahati have been using MICR cheques, it is possible to mechanise the processing of the instruments drawn on these centres and received for collection at the metropolitan centres under RBI's inter-city clearing service. When MICR clearing is introduced at these centres, the local NCCs may undertake the collection of cheques drawn on any of the MICR centres (not necessarily only those drawn on the four metropolitan centres).

SBI to organise Inter-city Clearing at centres not served by RBI

8.6 Attempts may be made to cover all the major commercial centres (say with more than 50 branches) under the National Clearing Service. The objective would be to ensure credit to customers' account within 5 working days if the instrument is drawn on any of the identified centres. At the 14 centres where RBI manages the clearing house, this service may be organised through RBI. At the remaining centres, one of the public sector banks may take the lead. Since the bank managing the clearing house would be in a better position to organise the work and as the SBI manages the clearing house at most of these centres, this collection service may also have to be organised by SBI at such centres.

Banks to continue their own collection mechanism

8.7 Banks may, as at present, continue with in-house cheque collecting mechanism, if for some centres, the in-house route for collection of outstation cheques proves to be less time-consuming. In short, the banks have to adopt the faster route whether through NCCs or through own arrangements.

Standard codeline structure for all payment instruments

8.8 A standard codeline structure may be prescribed for non-MICR cheques also as in the case of MICR cheques. This need not be printed in MICR ink. This would facilitate data processing on outstation cheques.

9. Use of BANKNET

9.1 BANKNET is a common data communication network set up by the RBI for facilitating transfer of inter-bank messages within India and was commissioned in February 1991. Technical details of the network are indicated at Annexure IX.

Coverage

9.2 The BANKNET connects at present seven centres viz. Bombay, Delhi, Calcutta, Madras, Nagpur, Bangalore and Hyderabad. Pune and Ahmedabad will soon be connected. Twelve other cities viz. Kanpur, Lucknow, Chandigarh, Kochi, Jaipur, Bhopal, Patna, Bhubaneswar, Thiruvananthapuram, Guwahati, Panaji and Jammu will also be brought on the network in a phased manner, either through leased lines or dial-up mode. In this way, all the centres where RBI has offices will be on BANKNET.

Members/Users

9.3 All the public sector banks (excluding the State Bank of Travancore) are members of BANKNET. Vysya Bank Ltd., DFHI, UTI, EXIM Bank also enjoy user status.

9.4 The number of ports installed at these member banks'/users' locales aggregate 192 and operate through DOT leased lines. Centre-wise distribution of ports is given at Annexure- X.

Level of usage

9.5 So far, the level of BANKNET usage has not been up to the expectations. About 80% of the messages sent were by RBI of which again 60% were from NCC ports.

In-house Committee of RBI

9.6 RBI had appointed an In-house Committee chaired by Shri D.S.Ramachandra Raju, presently Executive Director, to suggest remedial measures for activating the network and improve its usage. The Committee submitted its report in May, 1994. The present Committee has the benefit of the analysis done by the Raju Committee and agrees with the identified reasons stated for the poor usage of BANKNET.

Identified Reasons for Poor Usage of BANKNET

Lack of computerisation at branch level

9.7 The project was conceived for secure message transfer of funds and data; fixed format templates were therefore created to facilitate faster data input. It also expected computerisation at bank branches to process these transmitted messages. This expectation did not materialise. At best, only stand-alone ALPMs were installed in some of the branches. Total computerisation at the grass root level has been taken up only recently after the agreement with the employees union in the industry. Hence the requisite technology, hardware, and systems framework which were non-existent at the destination branches are only now being put in place. Thus in the initial period of 1991 to 1994, the BANKNET project could not make any impact on the communication scenario.

Wrong location of BANKNET ports

9.8 Wrong choice of location of BANKNET ports is yet another factor. In most of the banks, the ports have *not* been located in the funds managing branches (at which fund transfer messages *originate* and *end*). It was also not permissible to use the PSTN in conjunction with a private network such as BANKNET. This severely restricted the use of BANKNET.

Poor Quality of DOT Leased Lines

9.9 The quality of leased lines connecting BANKNET ports was prone to high errors/marginal quality conditions/frequent break downs. The down time was between 5 and 40 per cent and in some cases lasted 18 days or more. This turned away even the few prospective users having ports at their funds-dealing branches, from utilising the network. Whenever there was a need to communicate, the traditional mode of communication viz., telex, hot line, etc. were found to be more dependable.

Absence of Electronic Funds Transfer (EFT) System

9.10 Electronic Funds Transfer system is yet to evolve in the Indian banking industry and consequently the demand for electronic networks was not felt.

Lack of continued training arrangements

9.11 Though training was provided to all the staff initially posted at the BANKNET ports (the training related to handling of COMET software and operating procedures), lack of demand for using the network resulted in the trained staff getting shifted to other areas and even other centres. The newly posted staff at these ports were not provided any formal training in handling the system.

Software limitations

9.12 COMET (Computerised Message and File Transfer) software written in `C' has been developed to run on BANKNET user machines under DOS, XENIX and UNIX environment on PC and modem. The facility and know-how to modify/create screens was not made available to users, as a result of which even the banks which had well developed EDP centres could not customize the software to meet their needs and priorities.

Also COMET does not support Application Programming Interface (API). Other deficiencies observed in COMET are:

The software is designed only for secured message transfers and does not support transfer of files. Absence of file transfer facility has inhibited the usage of network for transmission of data files and other information.

Size of each message was limited to 512 bytes as against similar facility of 2k size in SWIFT. This has ruled out transmission of larger size messages such as circulars, policy statements, reports etc. under the free format message transfer utility provided in the software.

It is a store-and-collect network, and it is the responsibility of the receiver to collect the message destined for him. A serious shortcoming of the package is that it does not send back acknowledgment to source node. This was an important barrier in using BANKNET for fund-transfer- related messages.

COMET does not support more than one asynchronous communication port for connectivity to BANKNET.

It does not provide stage-wise status log.

COMET does not provide end-to-end encryption facility or notification of messages.

Remedial measures under implementation: Enhanced Version of COMET

9.13 The COMET software is being revamped for removing the various shortcomings. The new version which is presently under testing, provides for file transfer, increased message size, dial-up support, end to end encryption and other security features.

RBINET Communication Software to supplement COMET

9.14 An independent communication software RBINET was developed to overcome some of the limitations of the BANKNET package. It is User-friendly and the know-how is available in-house at RBI. This software provides all the features found lacking in the initial version of COMET, like facility for transmission of free format messages, circulars, reports, statements etc.

Recommendations

Extension of BANKNET

9.15 The physical reach of the network should be extended to all centres wherever RBI has its offices and to other centres having more than 100 bank branches (list of identified centres on the basis of data as on 30th June, 1994 is given at Annexure- VIII The Committee recommends that this may be completed within a time bound programme. All internal communications such as circulars, letters, data transfers should be sent by RBI to its offices on BANKNET so as to provide a demonstrative effect. RBI may also consider starting an electronic newspaper covering banking and monetary developments which can be circulated over the BANKNET.

9.16 About 40 percent business of all public sector banks is concentrated in the top 5 percent branches. It is these branches that are being taken up or likely to be taken up for Total Branch Computerisation (TBC). They have thus the application potential for using data communication networks. The Committee desires that a time bound programme to provide BANKNET connectivity to these branches may be

drawn up and its implementation monitored along with the monitoring of TBC Projects.

Release of Enhanced Version of COMET

9.17 The revised enhanced version of `COMET' may be released as early as possible with provision for the following additional functionalities:

- Dial-up support
- File transfer - ASCII and BINARY
- Bigger size of free format (minimum 2K) message
- End-to-end encryption/authentication of messages and files.
- Adoption of CRC/XOR/Checksum feature to ensure data integrity
- PING (Packet Inter Net Groper) facility
- Notification of messages
- Split Screen Visual communication with remote user.
- System and message status log
- Screen painter.
- Batch Input/Output Interface
- BACKUP and RESTORE facility.
- Bridge between BANKNET and SWIFT.

9.18 Interface between BANKNET and SWIFT may be established by incorporating frequently used SWIFT templates in the COMET software.

Developing EFT Culture by use of the Network

9.19 The funds transfer operations of banks should be brought under BANKNET particularly in the context of setting up an electronic funds transfer system in the immediate future.

TBC Software to have capability to process BANKNET Messages

9.20 The TBC software being implemented by banks may include provision for generating formatted messages that can be directly relayed through BANKNET as also similar provision to directly receive and process the messages from BANKNET. Banks may consider including BANKNET connectivity as an integral part of TBC software specifications.

9.21 Existing/future computerised applications may provide for a direct user interface with BANKNET/RBINET to facilitate on-line accessing, updation and processing of information transmitted through the network.

VSAT Transmission Technology for BANKNET

9.22 In due course VSAT transmission technology may be adopted for linking major centres covered under the BANKNET. For intra-centre connectivity users may acquire leased lines, radio links and also establish PSTN connectivity for backup. Low-volume-message branches may be connected by PSTN lines.

9.23 Switch over from voice grade transmission to high speed digital transmission facilities like fibre optics, radio frequency, own satellite channel, etc. may be explored.

Administrative Guidelines for BANKNET Users

9.24 BANKNET Users may be asked to keep their BANKNET systems powered up all the time on all working days. This would facilitate the Automode function of COMET to log on to

the host IBM system at preset intervals and collect the messages.

9.25 Hardware/software changes in IBM Mainframe systems and archival rules for removal of old messages from clogging the system have to be brought about to improve the speed and efficiency of the network.

9.26 There should be monthly meetings of core user groups and quarterly meetings of all users at a centre.

Remote IBM Mainframe to act as Backup for Message Handling

9.27 For enhancing the reliability of the Network, dependence on a single IBM system as the message host should be obviated. This may be ensured by providing connectivity to another designated IBM system which can function as a fall-back system in the event of the break-down of the main host.

Network Management Software

9.28 In order to monitor the performance of inter-city and intra-city links and nodes, an appropriate distributed Network management software may be deployed.

RBINET

9.29 RBINET, the communication software developed in-house at the RBI may be installed at all RBI offices. All Central Office Departments/Divisions and Regional Offices may be provided with RBINET nodes. Further, all banks may use this software for their communication with the RBI as also with their major branches, controlling offices.

Training

9.30 Training programmes on BANKNET and RBINET may be organised by Bankers Training College, Bombay at more frequent intervals than the same at present. To meet the growing requirements of training by the user banks, National Institute of Bank Management (NIBM), Pune may be requested to organise a training capsule exclusively on BANKNET and RBINET. This training capsule (for 3 to 4 days) may be organised at least once a month during the years 1995 and 1996. The objective is to train about 2000 officers of various banks on the working of BANKNET and RBINET.

9.31 Communication ports may be installed at each training establishment of RBI. Communication ports should also be provided at NIBM, Pune.

9.32 Adequate number of trained officers may be posted in each communication node.

9.33 Specific networking projects may be entrusted to summer placement trainees at RBI, who may perhaps bring to bear the latest technology in their assignments.

10. Optimum Utilisation of SWIFT in India

10.1 SWIFT (Society for Worldwide Inter-bank Financial Telecommunication) is an international computerised telecommunication Network, headquarters at La Hulpe, Belgium. It was set up in 1973 and went operational in 1977 with 15 founder countries in Europe and North America. At present the Network connects 4155 user banks and financial institutions in 105 countries. The daily average volume of Messages over the Network in September 1994 was over 2 million.

10.2 India was the 74th country which joined the SWIFT network, and avails itself of the facility of on-line, real time communication of international financial transactions since 2nd December 1991. The total number of live members/sub-members on the Network in India is 41.

10.3 SWIFT is, basically a store and forward messaging facility, providing 24 hours' service, seven days a week and thereby is a means of speedily transferring funds based and other messages between banks and other users of the Network.

10.4 SWIFT owns and operates its own processing facilities and leases communication systems from national and international carriers. The data processing and transmitting centres for connecting various member countries on SWIFT Network are located in Netherlands and in United States. Each operating centre has its own back-up facility and each is capable of serving as a back-up for the other, ensuring System availability at all times.

10.5 The overall availability of the Network during 1993 was 99.91%. The Network availability was 99.98% in 1994 (as of September 1994).

10.6 All messages go through the security procedures such as login, message authentication, encryption, decryption and verification of integrity as they pass through the System.

10.7 The different types of Standard Message Types available with SWIFT are as follows:

Category 0 → System Messages

Category 1 → Customer Transfer

Category 2 → Bank Transfer

Category 3 → Forex Loans / Deposits

Category 4 → Collections

Category 5 → Securities

Category 6 → Precious Metals and Syndications

Category 7 → Documentary Cheques

Category 8 → Travellers' cheques

Category 9 → Confirmation and Free Format messages

10.8 All SWIFT Users are expected to keep their terminals open for a minimum of seven hours during 8.00 hours to 18.00 hours of the local time on week days.

10.9 The responsibilities of SWIFT and those of the User institutions are well defined and codified. SWIFT undertakes to deliver the validated messages free of mutilation and data corruption in the shortest possible time.

10.10 The User banks in India have constituted, as in every other country, a forum called the SWIFT User Group (SUG). It provides a forum for discussing common issues faced by Group members. The SUG also plays a proactive role in dealing with SWIFT, Department of Telecommunications (DOT) and other Government Departments as well as with the hardware and software vendors. The post of the Chairman of this User Group is exofficio held by the Chairman of IBA. In his absence an Alternate Chairman from RBI presides over the deliberations. The Secretariat of the SUG is located in RBI.

10.11 Since the project was executed with the lead role provided by RBI, while permitting the SWIFT network in India, the DOT has designated RBI as the "Main Hirer" of the Network in India.

10.12 Initially the DOT had permitted only one branch of each bank in Bombay to be connected to the SWIFT network. Later, the DOT allowed linking of other branches to the SWIFT Computer Based Terminal (CBT) at Bombay, through leased lines, PSTN or Telex, depending upon the needs of each member bank. The response of member-banks in achieving further connectivity, has, however, been rather limited. Apart from the Reserve Bank of India, only a few member banks like the State Bank of India, the Punjab National Bank, Syndicate Bank, Canara Bank, Indian Overseas Bank, the State Bank of Hyderabad, have connected a few of their branches to their CBTs at Bombay. Banks are repeatedly enjoined at various levels to expand the use of SWIFT network so as to derive benefits like reduction in operational costs, achieving economies of scale, speedier processing and improved customer service.

10.13 RBI monitors the progress in using the network by member banks. A profile of the SWIFT User Group in India is given at Annexure XI.

All Foreign Exchange Dealing banks to join SWIFT

10.14 All banks and financial institutions authorised by RBI to deal in foreign exchange may be persuaded to join SWIFT. Presently there are only 41 of 84 institutions which have taken SWIFT membership.

All "A" Category Branches to be Connected to SWIFT Computer-Based Terminal Centre at Bombay

10.15 All "A" category branches of banks authorised to deal in foreign exchange (181 branches in all) may be provided with SWIFT connectivity so that these branches can prepare and transmit SWIFT messages with minimum intervention at its operating centre at Bombay. Banks' SWIFT Operation Centres (also called CBT centre) can also get the inward messages routed automatically to these branches. In a time frame of one year, all forex dealing branches (including "B" category branches numbering 1918) should be connected to SWIFT. For this the ordinary telexes provided at remote branches should be replaced by computerised communication system. They can use dial-up connectivity. Leased line connectivity is not essential unless the traffic (inward and/or outward) is substantial.

Sending Certain Categories of Messages by SWIFT should be made mandatory

10.16 Branches already connected to SWIFT may utilise the network optimally. The skewed distribution of messages (inward messages numbering 3 times the outward messages) can be corrected by making it mandatory on the branches

already connected to SWIFT for sending certain categories of messages only through SWIFT. Letters of credit are normally the lengthiest messages. They may be sent only through SWIFT.

SWIFT to have Training Infrastructure in India

10.17 In order to meet the training gap on SWIFT operations, SWIFT may be requested to have tie up arrangements with a leading training institution in the banking sector for conducting training programmes on a regular basis. The National Institute of Bank Management (NIBM), Pune is ideally suited for this activity and the Committee recommends that SWIFT may tie up with NIBM.

11. Credit Cards and EFTPOS

11.1 Plastic Money or Plastic Cards made its appearance in India in the form of Credit Card in the year 1981. Its usage has been steadily picking up since then. Plastic Money is popular the world over on account of its convenience in payment and safety. Plastic Money is now available in various packages. A significant percentage of all payment transactions in the developed world take place through this mode. As on date 12 banks in India have issued credit cards.

11.2 Internationally, Plastic Cards, fall under three broad groups :

Credit Cards

Debit Cards

Smart cards.

Credit card, as the name indicates, enables the card holder to enjoy credit from the issuing bank for a specific period after the payment. During this intervening period, the card holder is allowed to use the card for incurring further expenses. Some credit cards are called charge cards where the card holder enjoys credit only upto the next billing cycle. In the revolving credit cards, the card holder has the facility to pay in installments. In India most of the credit cards issued by banks are in the nature of charge cards.

11.3 Debit cards are of two types - Pay Now (i.e. instantaneous debit) and Pay Later (i.e. debit at a subsequent date). Automated Teller Machines (ATM) make instantaneous debit to the card holder's account. Other forms of debit cards have not been in use in India as yet. Electronic Fund Transfer at Point of Sale (EFTPOS) which is a popular payment mechanism in the developed countries may be made in `Pay

Now' or 'Pay Later' mode, depending upon the specific installations.

11.4 The Smart card is a relatively new concept. This differs from the debit/credit cards in the sense that the smart card has a built-in electronic chip in place of the magnetic stripe in the ATM card. As a result the transactions effected by the card holder are electronically recorded on the card itself. The smart card is a generic term covering both the credit and the debit cards.

11.5 Smart card is a store value card such as the prepaid telephone cards used by MTNL at Bombay and Delhi. It is increasingly put to use as an electronic purse for making retail payments and for replenishing the store value in the card periodically. These are normally `Pay Before' cards, unlike credit card and debit card which is either pay now or pay later cards.

11.6 The Committee had the benefit of interacting with three Organisations (Visa International Singapore. Elecom Fiscal Services Calcutta, Financial Software and System Pvt. Ltd.. Madras) on credit card, debit card and smart card. Hongkong Bank which has taken franchise for launching a smart card, in some countries also made a presentation on the special features of the proposed card called 'Mondex'.

11.7 The 'plastic card' market in India has reportedly been growing at an annual rate of 30 per cent. Presently, there are about a million card holders with an yearly turnover of about Rs.900 crores. It is estimated that by the turn of the century, "plastic card" market in India would be one among the largest in the world.

11.8 The **'Plastic Card'** business requires development of necessary expertise and creation of adequate infrastructure both in terms of organisational effort and investment in technology.

11.9 It is heartening to note that the recommendation of the Rangarajan Committee to establish a shared payment network is taking shape under the aegis of the Indian Banks Association (IBA). The details of the project have been finalised and the Shared Payment Network System (SPNS) is expected to be operational by September 1995. A write-up on the SPNS is at Annexure XII.

Recommendations

11.10 The Committee recommends that in order to promote card culture in India a Society of Card Issuers may be constituted. The IBA may take the initiative in forming such a society. The aim of the Society would be to:

- Establish proper procedures on prevention of frauds
- Monitor merchant establishment
- Make card business more lucrative
- Provide efficient services to the users

11.11 The Society's area of operation may also extend to the Shared Payment Network System (SPNS) being set up by IBA.

11.12 The scope of SPNS may be expanded to include the ATMs already installed at the major commercial centres of the country. In due course it may be made a nation-wide payment network.

11.13 Electronic Fund Transfer at the Point of Sale (EFTPOS) is the key to promote the growth of plastic card culture in India. Some of recent models of terminals for EFTPOS are not only cost effective but are also simple to operate and may find

ready acceptance by card holders, issuing banks and the merchant establishment. Consumers can make payments to the merchant establishments electronically and the merchant establishments can get themselves reimbursed either instantaneously through a hook-up to a central computer or at a later point of time through appropriate settlement mechanism. As a late starter, India may leap frog into the state-of-the- art technology innovations such as Stand-alone EFTPOS Terminals with smart-card technology.

12. Training Strategy

12.1 *The Rangarajan Committee* (1989) had laid emphasis on the availability of skilled and trained staff for successful implementation of computerisation projects. The said Committee had indicated that it would not be prudent for the banking industry to venture into electronic banking of the 1990s without a band of skilled, dedicated and professional personnel. These observations continue to be equally valid today. It can even be said that the technology advancements in the fields of computers and communications have made the training inputs more crucial for full application of the technology in the banking. In the changed industrial relations scenario, the doors have been thrown open for bank managements to set up computerised and communication based systems as and when warranted. The quicker a bank orients its personnel to the latest technology, the sharper would be its competitive edge.

12.2 *The Rangarajan Committee* had made an assessment of the training requirement of the banking industry by grouping the bank personnel into 6 broad categories - Computer Operator, Supervisory Staff, EDP Managers, Specialists in Computer Audit and Telecommunications, Trainers and Managerial staff. This Committee is in full agreement with those assessments. But considering that nearly 4000 bank branches are to be covered under the Total Branch Computerisation (TBC) in a short period of 3 years, the upgradation of technology in different applications and the high rate of obsolescence of technology, the number of personnel required to be trained would now be much larger. Although we are past the stage of awareness training on computer, the fact that a large section of managerial staff is still computer-shy cannot be ignored. Those who are already conversant with computers, have to be introduced to communication

technology. Thus, the number of managerial staff to be trained on computer and communication concepts is so large that it can not be met only by the conventional training colleges/centres of banks. Awareness training may have to be imparted through outside training institutes, self learning methods and distant learning programmes. However, for EDP Managers, Software engineers, Communication specialists, trainers, and computer users, need for advanced education and computer- laboratory training is essential. On a rough estimate, nearly 12,000 EDP Managers/Programmers/ Database Administrators would have to be trained for managing 4000 fully computerised bank branches. Number of trainers required for this purpose would also be in the range of 1000. Skills of staff posted in the Computer Policy and Planning areas would also require to be honed so that they can take sound decisions at the corporate level on procurement of hardware and software.

12.3 Presently there are a few national level training institutes in the banking industry, e.g. Bankers Training College, National Institute of Bank Management, which run programmes in computer area. Further, there are about 30 Staff Colleges and 150 training centres for in-house training by the various banks. *The Rangarajan Committee* had suggested setting up a separate Institute for Information Technology by major banks like the Institute of Communication and Management setup by State Bank of India at Hyderabad. So far, no other bank has setup any institute exclusively for information technology. The Committee had also suggested augmentation of faculty on computer and communications at NIBM, Pune. NIBM has of late, been organising more programmes in the technology area and also increasingly providing training inputs on technology in programmes in other areas (including general management).

12.4 It is emphasised that the training needs for banking personnel range from simple elementary operations exposure to

complex, advanced software and systems engineering. A thumb rule of creating bank level or even industry-level in-house training apparatus for the full range of training needs is neither practicable, nor cost effective. At the same time, it is recognised that the next generation of bankers will be a new class which can be termed as 'techno-bankers'. Of course, these techno-bankers will need to have varying levels of technology skills on the same lines as in the engineering industry. The human resources planning in the banking industry will have to be aimed at (i) providing appropriate technology inputs to the present manpower and (ii) creating training infrastructure in-house, in the industry and indeed in the macro level educational system in the country so that perspectively, the needs of advanced skills levels are met. The Committee deliberated at length on this vital matter and decided to make the following recommendations.

Recommendations

Training at the Work Place

12.5 The training in basic operations and functions such as E-mail, data backing up, copying of files, virus protection etc. should be provided at the work-places. For this purpose either the in-house resources or reliable outside trainers may be engaged. The emphasis should be on local presence of the trainers so that informal communication during and after the training is possible.

In-house training institutions to be strengthened

12.6 The resources for computer area training in the banks' own institutions should be strengthened and whenever necessary, faculty may be inducted from academic institutions on short term contracts. The banks' institutions will be ideal for imparting training in standard software packages like Lotus,

Wordstar etc., as also in application software of bankwide use, such as Accounts reporting.

Training requirements for IT specialists

12.7 The above arrangements would take care of the low-end training requirements of IT in banks. Training of the key-personnel responsible for the smooth running of the operations is also a high priority. Typically these persons are required to discharge specialised functions such as Network management, Data-base administration, Funds management, Dealing room operations, Forex management, Customer queries, Management Information System, Decision Support Systems etc. They need to be equipped with a thorough knowledge of the state-of-the-art techniques and tools in the IT area. They should be trained on systems and application programme utilities so that they need not depend on experts for day-to-day trouble shooting requirements.

Long duration courses at national level institutes

12.8 The Committee recommends that an intensive and specialised training of 4 to 6 months' duration may be imparted covering all major aspects of IT, such as systems design, Case tools and 4 GLs, RDBMS and related utilities, networking and communications etc. for the EDP managers, Data base Administrators and specialists in the Computer Policy and Planning Departments of banks. The National Institute of Bank Management (NIBM) may be requested to organise such a training course annually, specifically tailored to the needs of the banking industry. The National Centre for Software Technology (NCST) and the National Informatics Centre (NIC) may also consider conducting similar courses with emphasis on software design, hardware selection, benchmarking, development of software etc. In fact these institutions may conduct the courses jointly offering different capsules.

Posting of IT trained personnel

12.9 An objective assessment of the trainees undergoing the courses would impart a sense of purpose to the training. On return to their respective banks, the trainees should be posted to Information Technology related area. In fact, the performance of the trainees during and after the training may even be considered as inputs to their being considered for promotion.

Setting up a Research Institution on Banking Technology

12.10 The industry needs a core Computer Group capable of developing sophisticated application software at bank/industry level, planning large data bases, evolving suitable MIS, DSS etc. This group should not only possess a very high level of skills in IT but should also possess expertise in banking/finance/accounting/audit etc. and be conversant with the latest developments in these areas. A new generation of Techno-bankers who are software engineers specialising in financial management or bankers/accountants/managers with Information Technology expertise may emerge. The Committee is of the view that the above interests will be best served if a specialised Institute of IT is set up to cater to the specific IT requirements of the Banking Industry. This may be set up as an autonomous Institute which in due course may seek a Deemed University status. The Institute will not only develop technical personnel of a high calibre (comparable to the Institutes of Management) but also undertake research projects in IT as applied to Banking and Financial Sector. The Institute may take up specific projects for software development on a turn-key basis. The Committee understands that RBI is commissioning a Training College at Hyderabad with two or more channels earmarked for IT. This

college may be considered for being developed into an autonomous IT institute.

12.11 An academic council comprising experts from RBI, banks and academics may decide upon the various courses to be offered by this Institute, their duration, course content, eligibility criteria for admission, faculty strength and qualifications, fee structure etc. The council may be chaired by RBI. The banks' staff trained at this institute should be the main stay of the IT departments of banks.

Sponsoring learning programmes at IITs, IIMs, ISI etc.

12.12 The banks may also sponsor learning programs at the premier institutes of learning such as Indian Institutes of Technology (IITs), Indian Institutes of Management (IIMs), Indian Statistical Institute (ISI) etc. Sabbaticals for the purpose of acquiring IT qualifications may be encouraged. The RBI and some of the banks may even institute chairs in recognised universities for furthering the techno-banking studies.

Self learning

12.13 So far, we have identified the different types of training which are instructor oriented. There is another option available and that is *self-learning* through standardised training aids. Perhaps, this may become the most common form of training for low-end group, in the future. This is a cost-effective and time-saving strategy to supplement the conventional classroom training programmes. This may take the form of: i) Instruction Manuals ii) Tutorial software packages (programmed texts); and iii) Video tapes (supplemented by notes and assignments) Instruction manuals have to be prepared for each item of work (eg. opening of an account, interest calculation) in such a way that

staff posted therein may learn to perform a specific item of work by following the given sequence of instructions. Where these are bank-specific, the concerned colleges may develop these tutorials. Software packages are already available for MS-DOS, UNIX, LOTUS 1-2-3, Oracle etc. Similar software may be developed for banking applications like dealing room operations etc. Video cassettes and multi-media discs may be extremely useful for simulating the work environment. NIBM is best suited for developing and promoting such packages.

Publication of a Magazine on Banking Technology

12.14 In order to disseminate information among the banking personnel, a magazine "Banking Information Technology" (BANKIT) may be brought out with the active involvement of bankers, academic institutions, and houses of hardware/software/communication services. IBA could consider starting such a publication. It may cover the latest developments in the field. Tutorials on new packages, product capabilities etc. may be covered therein. The magazine made be sold on Network, video, hard copy according to the user preference.

13. Conclusion

RBI and Technology in Banks

13.1 RBI has been coordinating the banks' computerisation programme. The RBI's concern over the technology upgradation in the banking industry stems from its role as the regulator of the banking system and its responsibility towards the efficacy of the payment system. The rapid changes taking place in the global scenario have brought home the fact that technology plays a crucial role in the competitive efficiency of the Indian banks in the internationally integrated environment

Time-frame for Implementation

13.2 A change in technology of such a magnitude cannot be brought about in a short time. India can benefit by leapfrogging into the state-of-the art technology. However, this is not easy. Indian banks are of varying sizes, have large geographical spread and are at different levels of technology usage. The legal framework in which banks have been operating has also not kept pace with the advances in technology. Therefore, the Committee has kept in view a time-frame of three years to implement all its recommendations. All the same, the Committee would like to record that some of the recommendations can be implemented in a much shorter time, say less than a year. The issues which depend upon statutory changes will obviously have to wait and the RBI would do well to initiate the process for effecting amendments to the respective laws without delay.

Training Recognised as the Key Issue for Technology Upgradation

13.3 The issue that came up for discussions repeatedly in the Committee meetings was that of recommending a suitable

training strategy. The senior bankers, during their interaction with the Committee, pointed out that training is a critical issue in technology upgradation. In many banks, Total Branch Computerisation (TBC) has not succeeded to the desired extent mainly because of non-availability of suitable trained personnel. It is sometimes said that the cost of organising training is prohibitive. What is not realised is that the cost of ignorance could be far higher.

Standing Committee

13.5 The Committee suggests that the Reserve Bank of India may set up a Standing Committee under the Chairmanship of its Executive Director. The Committee may have representation from banks, government departments, research and training institutions and IT industry. It should take periodic review of the technology status in the banks and also recommend adoption of new technologies in different functional areas. The Standing Committee should ideally be an effective link between banks as users of the technology and IT agencies as suppliers.

Funding

13.6 In order to achieve the level of technological progress as recommended by the Committee banks will have to make considerable investment in terms of acquiring necessary computer and communications infrastructure and for training the EDP personnel. The Committee therefore suggests that the possibility of procuring financial and technical assistance from multilateral agencies like IMF, World Bank etc. may be explored.

14. Summary of Recommendations

Remittance facilities to banks' customers

14.1 An Electronic Funds Transfer (EFT) system may be setup. The BANKNET communications network may be the carrier. The fund settlement may be effected at the originating and the destination centres through the accounts of banks, maintained at the banks managing the respective clearing houses. ***(paras 2.9, 2.10 and 2.11)***

14.2 The ultimate goal of the EFT is to facilitate funds transfer between two bank branches. To start with, message transfers to the destination centres may be in a batch mode. High value institutional fund transfers (Rupees 10 million and above) may be batched every hour while the retail customers transfers may be batched at the end of the day. ***(para 2.12)***

14.3 The Scheme may cover all important centres in a phased manner, starting with the 4 metropolitan centres.***(para 2.9)***

14.4 For operationalising the EFT scheme banks may install the necessary computer and communication infrastructure (a PC/AT, a printer, a modem and direct telephone line) at their Service / Main branches. They should also have connectivity to BANKNET. ***(para 2.16)***

14.5 Steps may be initiated by RBI to enact suitable legislation on the lines of Electronic Fund Transfer Act 1978 in the USA and Data Protection Act 1984 in the UK. ***(para 2.20)***

Reporting of SGL transactions in government securities

14.6 A DVP System in SGL transactions may be introduced at the Public Debt Office, Bombay. This may later be extended to other major centres. ***(para 3.20)***

14.7 The DVP System will cover SGL accounts of all those institutions who are also having current accounts at the Reserve Bank (Deposit Accounts Departments). ***(para 3.13)***

14.8 Settlement may be on gross basis both for securities (i.e. SGL) transactions in the Public Debt office and current account (i.e. funds) transactions in the Deposit Accounts Department. ***(paras 3.16 and 3.20)***

14.9 Relevant provisions in Public Debt Act 1944, Public Debt Rules 1946 and Bankers' Books of Evidence Act 1891 may be amended to empower RBI to revise the SGL transfer form and in due course introduce screen based reporting of such transactions. ***(paras 3.10, 3.11 and 3.12)***

14.10 The concept of "Clearing Bank" may be introduced for extension of DVP mode to all trading in Government Securities. ***(para 3.14)***

14.11 The "Clearing Bank" will be required to maintain a clear distinction between operations on its own account and those on behalf of its clients. ***(para 3.14)***

14.12 Once the DVP system stabilises, the system of screen based reporting of SGL transactions should be introduced. SGL Transfer Form may be replaced by electronic screen formats. ***(para 3.21)***

Reporting of currency chest operations

14.13 RBI may explore the feasibility of using NICNET for electronic reporting of currency chest transactions. Dial-up connectivity through PC Modem may also be used. *(para 4.10)*

14.14 The currency chest branches with STD facility may transmit the currency chest data to both the Issue Office of RBI and their respective Link Offices either through NICNET (by dialing the local NICNET node) or through PSTN lines. The branches not having STD facility may report the data by telephone/ telegram to their district headquarters branch, which in turn would transmit these data to the Issue Office of the RBI and its Link Office. *(paras 4.11, 4.12, 4.13 and 4.14)*

14.15 Later, when STD facility becomes available at the remaining currency chest branches, all currency chests may transmit data direct to the Issue Offices of the RBI and the Link Office. *(paras 4.15, 4.16 and 4.17)*

14.16 RBI will, on a daily basis, make available the currency chest data received during the day to the local Link Offices of the respective banks, before the closing hours. *(para 4.18)*

Reporting of government transactions

14.17 Fund Settlement in respect of Government transactions may be delinked from submission of scrolls and documents (challans/paid cheques) to the Pay and Accounts Offices (PAO) of Government Departments. Reporting of transactions to RBI for fund settlement and forwarding of scrolls to PAO may take place simultaneously. *(para 5.10)*

14.18 Bank branches undertaking Government business may communicate the net receipt and payment position by PC Modem/telex/telegrams to their respective focal point

branches on the same day, for further communication of the consolidated figures electronically to their Link Cells at Nagpur. The Link Cells would consolidate and forward the data files on floppies, tapes or directly to computer to CAS, Nagpur before a prescribed time of fund settlement. This will ensure a T + 1 system. ***(paras 5. 10 and 5.11)***

14.19 Link cells of all banks at Nagpur, all focal point branches, State Government link offices should be computerised. ***(para 5.12)***

MICR clearing at metropolitan centres

14.20 Repetitive or low value transactions like interest, dividend, refund of primary issue subscriptions, salary, pension, etc. may be effected electronically, by introducing "Electronic Clearing Service (ECS)". The facility may be extended to all corporate bodies/ Govt. Departments. Debit Clearing should also be introduced for pre-authorised debits for payments like insurance premia, taxes, loan installments etc. ***(para 6.10 and 6.11)***

14.21 A "Bills Payment System" may be introduced which will enable the customers of utility services to pay their bills by debit to their accounts in the banks. The Utility service agencies may redesign the formats of their bills to enable automatic data capture of the paid bills at the debiting branch/bank level. The settlement may be effected at the RBI on the basis of the data supplied by banks. Suitable costing of the banks' services may be done for charging the utility agencies. ***(para 6.12)***

14.22 Cheque clearing work may be decentralised by introducing "Clearing Bank" concept for efficient cheque processing. Member banks of a clearing house may join one of the Clearing banks Groups. Each Group may have its own in-house, cheque processing facilities and other infrastructure. At Bombay, there should be atleast three Clearing Groups

while at other MICR centres, there should be two Clearing Groups. ***(para 6.13)***

14.23 "Clearing Banks" will provide mutual backup to each other in case of disaster at any cheque processing site. ***(para 6.16)***

14.24 All MICR instruments should be of a uniform size. MICR codeline should be modified to include an additional field to indicate minimum control information (e.g. the scroll number) of the presenting banks. ***(paras 6.17 and 6.19)***

14.25 Banks should equip their Service Branches and other large branches with computer and communication infrastructure (PC/ATs, printer, network software, dial-up capabilities etc.) so as to enable them to present and receive the cheque clearing data (both outward and inward) electronically. ***(para 6.18)***

14.26 At Bombay, all Inter-bank payments which are now settled through inter-bank clearing at the end of the day should be settled by on-line computer links between the RBI and the banks. Such fund transfers may be on a gross basis. ***(para 6.21)***

14.27 Cheque Truncation System should be introduced initially for Intra-bank cheques of value upto Rs.5000/-. In due course, it may be extended to inter-bank instruments. Suitable changes in the Negotiable Instruments Act and other relevant acts may be initiated. ***(para 6.22)***

Cheque clearing at non-metropolitan centres

14.28 MICR clearing should be introduced at Ahmedabad, Bangalore, Hyderabad, Pune, Baroda and Surat at the earliest and dependable back-up arrangements should be planned right from the beginning. ***(paras 7.6, 7.7, 7.8)***

14.29 Cheque clearing centres should be financially self supporting. *(para 7.9)*

14.30 All centres having more than 100 bank branches should be taken up for MICR clearing. *(paras 7.10 and 7.11)*

14.31 The system of "Floppy Input Clearing" may be introduced as an interim measure pending MICR clearing at these centres. *(para 7.12)*

14.32 Clearing arrangements should be set up at all centres with five or more banks. *(para 7.13)*

Collection of outstation cheques

14.33 National Clearing Cells of RBI may use the BANKNET for reporting the particulars of unpaid items of inter-city clearing on the network to the originating centres and for sending the credit advices to the banks. The collection cycle in RBI's National Clearing service can further be reduced by adopting this system. *(para 8.4)*

14.34 Coverage of RBI's National Clearing of Inter-city Cheques may be extended. To start with, the centres which are already connected in one way clearing may be linked for two way clearing. *(para 8.5)*

14.35 State Bank of India may organise inter-city clearing at centres not served by RBI on the lines of National Clearing Services of RBI. *(para 8.6)*

14.36 Standard codeline structure should be prescribed for non- MICR cheques also to facilitate data processing of outstation cheques. *(para 8.8)*

BANKNET

14.37 The physical reach of the network should be extended to all centres where the RBI has offices and aiso to other centres which have at least 100 bank offices. ***(para 9.15)***

14.38 Branches covered under Total Branch Computerisation (TBC) and the Service branches of banks should be equipped with BANKNET nodes. ***(para 9.16)***

14.39 The `COMET' (the communication software for BANKNET) should provide for the following additional functionalities:

a) Dial-up support;

b) File transfer - ASCII and BINARY;

c) End-to-end encryption/authentication of messages and files.

d) Adoption of CRC/XOR/Checksum feature to ensure data integrity;

e) PING (Packet Inter Net Groper) facility;

f) Notification for messages;

g) Split Screen Visual communication with remote user

h) System and messages status log:

i) Screen painter.

j) Batch Input/Output Interface

k) BACKUP and RESTORE facility.

l) Bridge between BANKNET and SWIFT ***(para 9.17)***

14.40 Switchover from voice grade transmission to high speed transmission facilities like, VSAT technology, fibre optics, radio frequency etc. may be targeted. ***(paras 9.22 and 9.23)***

14.41 BANKNET Users may keep the BANKNET machines powered up on all working days all the time to facilitate the Automode function of COMET to log in to the host IBM system at pre- set interval and collect the messages. ***(para 9.24)***

14.42 For enhancing the reliability of the Network, dependence on a particular IBM system to act as the message host may be overcome by providing the facility of automatic fall back on any other IBM system if one of them is down. ***(para 9.27)***

14.43 RBINET, the communication software developed inhouse at RBI may be installed at all RBI offices. All Central Office Departments/Divisions and Regional Offices may be provided with RBINET nodes. Further all banks may use this software for their communication with the RBI as also with their major branches, controlling offices. ***(para 9.29)***

14.44 National Institute of Bank Management (NIBM), Pune may organise training capsules on BANKNET and RBINET on crash basis to train bank officers in the use of the network. ***(para 9.30)***

SWIFT

14.45 All banks and financial institutions authorised by RBI to deal in foreign exchange business (84 at present) may join SWIFT. At present 41 authorised dealers have taken SWIFT membership. ***(para 10.14)***

14.46 All "A" category branches (181 in all) of banks authorised to deal in foreign exchanges may be linked to their respective SWIFT Operating Centres at Bombay. All "B"

category forex dealing branches (1918 in all) may also be connected to the respective SWIFT Operating Centres at Bombay in a phased manner. ***(para 10.15)***

14.47 Banks connected to SWIFT may utilise the network optimally. ***(para 10.16)***

14.48 To meet the training gap on SWIFT operations, SWIFT may be requested to have tie up arrangements with one of the training institutions in India (preferably NIBM, Pune) for conducting training programmes on a regular basis. ***(para 10.17)***

Credit Card and EFTPOS

14.49 To promote card culture in India, a Society of Card Issuers may be constituted. The Indian Banks Association may take the initiative in forming such a Society. This Society could be useful to establish proper procedures on prevention of fraud, monitor merchant establishments and make card business more profitable. ***(para 11.10)***

14.50 For effective utilisation of the resources of the proposed SPNS, the ATM card to be issued may be a multipurpose card. Besides ATM cards this network may also connect Point of Sale (POS) terminals, Branch Teller Machines (BTMs) and cash dispensers. The network should also provide connectivity to smart card as also other cards such as VISA, Mastercard and AMEX. ***(paras 11.11 and 11.12)***

14.51 Electronic Fund Transfer at Point of Sale (EFTPOS) and use of smart cards may be promoted to develop a plastic money/ electronic money culture. ***(para 11.13)***

Training

14.52 Training at the work place should be organised for certain routine applications like copying/deleting of files,

virus protection, E-Mail etc. Emphasis should be on local presence of the trainers. *(para 12.5)*

14.53 In-house training institutions should be strengthened for higher technology inputs in all training programmes by providing state-of-the-art infrastructure and skilled faculty. *(para 12.6)*

14.54 National Institute of Bank Management (NIBM), Pune may design intensive and specialised training programmes of 4 to 6 months' duration for EDP Managers, Database Administrators and other specialists. National Centre for Software Technology and National Informatics Centre may also be requested to organise training programmes, specially designed for bank personnel. *(paras 12.7 and 12.8)*

14.55 An institute on banking technology may be setup with the objective of imparting high-level technology training to the bankers. It may be an autonomous institute offering professional level courses. *(paras 12.10 and 12.11)*

14.56 Banks may sponsor high level academic courses in information technology with specialisation in banking technology at the premier institutes of learning such as IIT, IIM, ISI. Sabbaticals for acquiring IT qualifications may be encouraged. *(para 12.12)*

14.57 NIBM may take lead in preparing self-learning video material on commonly used banking application packages. *(para 12.13)*

14.58 IBA may start a monthly magazine on Banking Technology. *(para 12.14)*

Standing committee

14.59 A Standing Committee on Technology Uses in Banks should be set up under the aegis of RBI to periodically review the technology status in the banking industry. *(para 13.4)*

(W. S. Saraf)
Chairman

(R. Narasimhan)

(H. Dinesh Nayak)

(B. Choudhuri)

(B. S. Sharma)

(C. K. Bapiraju)

(A. K. Bakhshy)

(S. M. Padwal)

(D. B. Phatak)

(K. K. Bajaj)

(Bharat Desai)

(Arvind Sharma)

(Smt.R. Anantha Krishnan)
Member - Secretary

Bombay
December 9, 1994

Annexures

Annexure I

Sub-committee on remittance facilities and communications network

Terms of reference

1) To Review the remittance facilities available to banks' customers and propose new procedures for quicker service.

2) To Review the SWIFT operations and suggest steps for expansion of its access.

3) To Propose steps for further extensive use of BANKNET.

Members

1. **Shri H. Dinesh Nayak**
   Chairman
   Executive Director,
   Indian Bank. Madras.

2. **Shri A.K. Bakhshy**
   Member
   Secretary,
   Indian Banks Association,
   Bombay.

3. **Shri G.S.R. Anjaneyulu**
   Member
   Dy. General Manager,
   (Communication Services),
   State Bank of India,
   Central Office,
   Bombay.

4. **Shri Bharat Desai**
   Member
   Senior Manager,
   National Centre for Software Technology,
   Bombay.

5. **Shri K.K. Gopalakrishna Pillai**
   Member
   Dy. General Manager, CPPD,
   Corporation Bank,
   Mangalore.

6. **Shri R.P. Pathak**
   Member
   Joint Adviser,
   Management Services Department,
   Reserve Bank of India,
   Bombay.

7. **Shri A.N. Nayak**
   Member
   Asst. General Manager,
   Cancard Division,
   Canara Bank, Central Office,
   Bangalore.

(*Smt.R. Anantha Krishnan*, Member-Secretary of the Main committee *and Shri A.P. Hota*, Asst. Adviser, MSD, RBI, also attended the meetings of the Sub-committee).

Meetings held

The Sub-committee met three times - 17th August, 21st September and 6th October 1994. Special Presentations by IT agencies were organised as follows:

AT & T	Payment System Development
FSS(P) Ltd.	EFTPOS
Visa	Credit/Debit Cards

Secretarial support was provided by *Shri E. Venkateswara Rao*, Dy. General Manager, Indian Bank and *Shri C.R. Kalyanasundaram*, Chief Manager, Indian Bank. The Sub-committee presented its Report to the main Committee on 11th November 1994.

Major recommendations

BANKNET

1. BANKNET may be used as the primary mode for communication between banks, financial institutions and RBI.

2. BANKNET may be expanded to cover all major commercial centers in the country.

3. Connectivity between BANKNET and SWIFT may be provided to enable the routing of SWIFT messages from SWIFT centre to forex branches of the banks. SWIFT templates have to be provided in the BANKNET software to ensure this facility.

4. Electronic Data Inter-change (EDI) standards may be used for transmission of messages over BANKNET.

5. The communication software (COMET) being used with BANKNET may be upgraded to overcome the reported shortcomings.

6. Continuous availability of the system (hardware. software and leased lines) may be ensured.

7. As in the case of SWIFT. the BANKNET may also be managed by a society of member banks, which will lay down the operational procedures and rules.

SWIFT

8. All banks with large foreign exchange dealings should join the SWIFT Network if they have not joined so far. Small banks may consider shared connectivity.

9. Bank branches handling foreign exchange transactions may be equipped with the requisite software and hardware for connecting to SWIFT. Such software may be customised to suit the needs of individual banks.

10. Computerised communication system through an STD facility may be provided at such branches for uplinking them through modems to the SWIFT service centre at Bombay. High speed modems may be used if traffic volumes are large. The modem route is versatile as well as economical and may be encouraged. I-NET provides dial up connection at I-NET centres and '009' connection at a few other places. The transmission cost through I-NET seems to be even more economical compared to those of STD.

11. Training of personnel for operating the system as also for providing EDP services, may be undertaken on a priority

basis. Such training may be arranged to be imparted at NIBM or NCST.

Credit Cards and EFTPOS

12. Banks may fully exploit the market potential for credit cards etc. Exploiting the latest technology and sharing of services are recommended.

13. A Society may be formed comprising all card issuing banks.

14. All Indian credit cards may be brought under one banner. This would ensure uniform and regulated issue of cards, and accelerate their growth.

Remittance facilities

15. An Electronic Funds Transfer System (EFT) may be set up using the BANKNET communication network which is being upgraded. Financial messages may conform to Electronic Data Inter-change (EDI) standards.

16. A concept of Network service centre may be introduced so that branches of a bank in a given BANKNET centre may get connected to the network through the nodal service centre of the respective banks.

17. There is an urgent need to enact suitable legislation relating to the operational aspects of EFT in India along the lines of Electronic Fund Transfer Act in the USA and Data Protection Act in the UK.

Annexure II

Sub-committee on reporting of government transactions and currency chest operations

Terms of reference

1. To propose the use of computer and communications technology for daily reporting of currency chest operations by currency chest branches to link offices/RBI.

2 To review the existing procedures of reporting of Government transactions by bank- branches to their link offices and RBI and propose computer based reporting in a time- bound manner.

Members

1. **Shri R. Narasimhan,** — Chairman
   Deputy Managing Director,
   State Bank of India,
   Central Office,
   Bombay.

2. **Dr. K.K. Bajaj,** — Member
   Senior Technical Director,
   National Informatics Centre,
   New Delhi.

3. **Shri P.R. Krishnamurthy** — Member
   Manager,
   Reserve Bank of India,
   Hyderabad.

4. **Smt. L.S. Hoskote**, Member
Dy. General Manager
(Computer Policy & Planning),
Union Bank of India,
Bombay.

5. **Shri V. Janakiraman**, Member
General Manager (Corporate operations)
State Bank of India,
Central Office,
Bombay.

6. **Shri D. Natarajan**, Member
General Manager (Associate Banks),
State Bank of India,
Central Office,
Bombay.

7. **Shri N.K. Jain**, Member
Dy. General Manager (Banking Operations),
State Bank of India,
Central Office,
Bombay.

8. **Shri K.H. Srinivasan**, Member
Dy. General Manager (Govt. Accounts),
State Bank of India,
Central Office,
Bombay.

9. **Shri G.S.R. Anjaneyulu**, Member
Dy. General Manager
(Communication Services),
State Bank of India,
Central Office,
Bombay.

(*Smt. Rama Anantha Krishnan*, Member Secretary of the Main Committee and *Shri A.P. Hota*, Asst. Adviser, MSD, RBI, also attended the Sub-committee meetings).

Meetings held

The Sub-committee met twice - on 3rd August 1994 and on 28th September 1994. *Shri T.V.R. Mohana Rao*, Chief Manager and *Shri T.N. Anand Kumar*, Asst. Manager- both of Communication Services Department of State Bank of India, Central Office provided secretarial support.

The Report of the Sub-committee was presented to the main Committee on 11th November 1994.

Major recommendations

Reporting of Currency Chest Transactions

1. An Electronic reporting system may be introduced using an efficient and dependable communication link between currency chest branches, Issue Departments of RBI and Link offices of banks. NICNET connection may be the primary mode of communication with PSTN dial-up connectivity as backup.

2. In the first phase, currency chest branches with STD facility may report the transactions to RBI and simultaneously to their link office. The other branches may report the figures to their district head quarter branches, who in turn may report to RBI and the link office. In due course (i.e. second phase) these branches may also have the computerised communication facility as soon as STD facility is made available.

3. RBI may make the settlement data available to the link office at least an hour prior to the close of business transactions.

4. RBI may provide support to banks by way of financial assistance for creation of the necessary infra-structure at the currency chest branches.

5. RBI may review the present instructions for penal levies.

Reporting of Government Transactions

6. As in the case of reporting of currency chest transactions, NICNET connections may be considered as the primary mode and PSTN dial-up connections as the fall-back arrangement.

7. For central government transactions, presently it is stipulated that the focal point branches should report the transactions to their Link Cell for fund settlement at RBI only after due scrutiny of the scrolls and documents (receipted challans/paid cheques) and forwarding the same to PAO. Under this system, it is not practicable to settle funds at RBI within 3 days. Therefore, the feasibility of delinking the sending of scrolls and documents to Government Departments the reporting of transactions to RBI for fund settlement may be considered. This way, it may be possible to complete fund settlement at CAS, Nagpur the next day.

8. Government bills may be replaced by cheques.

9. Remuneration to banks for handling Government business can be directly paid on a quarterly basis by RBI, based on turnover figures instead of insisting on claims by banks.

10. A system of value dating should be introduced.

11. A high powered committee should be constituted by RBI to review the rates of commission on Government transactions based on the present cost structure.

Annexure III

Sub-committee on cheque clearing system

Terms of reference

1. Review of MICR Clearing at Metropolitan Centres
2. Inter-bank Clearing System
3. Review of Clearing System at Non-Metro Cities
4. Cheque Truncation
5. Credit Clearing and Utility Payment System

Members

1.	**Shri A K Bakhshy** Secretary Indian Banks' Association	Chairman
2.	**Smt. Rama Anantha Krishnan** Director - DESACS Reserve Bank of India	Member
3.	**Prof. D B Phatak** Professor Dept. of Computer Science and Engineering Indian Institute of Technology - Bombay	Member
4.	**Shri Arvind Sharma** Chief Executive Officer, UTI Investor Services Limited, Bombay	Member

5.	**Shri N.K. Ghongane** Dy. Adviser National Clearing Cell Reserve Bank of India	Member
6.	**Shri A P Hota** Asst. Adviser, MSD Reserve Bank of India	Member
7.	**Shri L Raghavendra** Chief Manager (CST) Bank of India	Member
8.	**Shri Kishore Oka** Vice President - Telecom & Hardware Citibank	Member
9.	**Shri A G Prabhu** Senior Vice President (IT) ICICI Bank Ltd.	Member

Meetings held

The Sub Committee met three times - on 19th July, 1994, 13th August, 1994 and 17th September, 1994. *Shri B R K Kamath,* Executive, Banking Operations, *Shri V Ramchandran,* Officer- in-Charge, Management Services Department, and *Shri V Lakshmisubramanian,* Systems Manager - all of Indian Banks Association provided secretarial support.

Cheque Clearing at Metropolitan Centres

1. Electronic Clearing Service (ECS) - Credit Clearing and Debit Clearing should be introduced for bulk and repetitive payment transactions like interest, dividend, salary, pension, commission and payments of utility bills, insurance premia, taxes and loan repayments. This will reduce the growing strain on the cheque clearing system at the metropolitan centres.

2. A "Bill Payment System" may be introduced to enable the consumers/subscribers of utility services to make their utility bill payments through their own bankers.

3. The "Clearing Bank" concept should be introduced at each large centre so that member banks of the clearing house will join one of the Clearing Groups headed by a clearing bank instead of all banks sending their cheques for processing to a single point.

4. Clearing Groups will provide mutual backup to each other in case of disaster at any cheque processing site. The configuration of the cheque processing equipment may be worked out accordingly.

5. All MICR cheques should be of uniform size irrespective of the category of instrument.

6. MICR codeline should be modified to include an additional field to indicate the scroll number of the Outward Clearing Register of the presenting bank branches.

7. Cheque Truncation System should be introduced with Intra-bank cheques of value upto Rs.5000/-.

Inter-bank clearing system at Bombay

8. At Bombay, an Inter-bank Electronic Payment System (I-BEPS) should be introduced to enable banks to initiate balance enquiry, inter-bank fund transfer and inter-centre fund remittance by access to RBI's computer at Deposit Accounts Department.

Cheque clearing at centres other than MICR centres

9. MICR clearing should be introduced as early as possible at Ahmedabad, Bangalore, Hyderabad, Surat, Pune and Baroda . Subsequently, all major centres having large number of bank branches should be taken up for MICR clearing.

10. The system of "Floppy Input Clearing" may be introduced as an interim measure pending MICR clearing.

11. Clearing arrangements should be made at all centres with five or more banks.

Collection of Outstation Cheques

12. The centres which are connected in one way inter-city clearing to metropolitan centres may be linked for two way clearing, if the traffic is adequate and if the bank branches at the connected centres are already using MICR cheques.

Annexure IV

Organisations with whom the committee/sub-committees interacted

Organisation	Issues discussed
AT & T, New Delhi	Payment System Development and AT & T's products and services.
VISA International, Singapore	Credit card scenario in India.
Matercard International (Asia-Pacific)	Credit cards as a payments system
SWIFT, Hong Kong	SWIFT services in payments system development
Brinks Arya (I) Pvt.Ltd., Bombay	Cheque processing services to banks in India by Brinks Arya Ltd.
Financial & Fiscal Services Ltd., Madras	Feasibility of developing a nation-wide payment system network.
Elecom Ltd., Calcutta	Smart Card Technology and its application in banking industry.
Kanoria Information Services Ltd	Electronic Fund Transfer Services and products of Kanoria Information Services Ltd.
Microland Ltd., Bangalore	Networking solutions.

Contd...

Contd...

Organisation	Issues discussed
Indchem, Madras	Cheque processing products and networking solutions by Indchem for banking industry.
Hongkong Bank, Bombay	Scope of MONDEX CARD service in India.
India Equipment Leasing Ltd., Madras	Banking Services
Academy for Management Excellence, Madras	Technological strategies for banking industry
Software marketing Corporation	Multimedia and E-Mail
National Informatics Centre, New Delhi	Use of NICNET by the banking industry
Kanara Chamber of Commerce and Industry	Electronic Fund Transfer
CYLINK Ltd.	Radio wave linkup
Clearing houses at Bombay, Calcutta, Madras, Hyderabad and Pune	Cheque clearing system and collection of outstation cheques.

Annexure V

G-30 Recommendations

1. By 1990 all comparisons of Trades, between direct market participants (i.e. brokers/dealers and other exchange members) should be accomplished by T + 1.

2. Indirect market participants (such as Institutional investors, or any counter party which are not brokers/dealers) should by 1992, be members of a Trade comparison system which achieves positive affirmation of Trade details.

3. Each country should have an effective and fully developed Central Securities depository organised and managed to encourage the broadest possible industry participation (directly or indirectly by 1992).

4. Each country should study its market volumes and participation to determine whether a trade netting system would be beneficial in terms of reducing rates and promoting efficiency. If appropriate implement by 1992.

5. Delivery versus payment (DVP) should be employed as a method for settling all transactions. A DVP system should be in place by 1992.

6. Payments associated with the settlement of securities transactions and the servicing of securities portfolios should be made consistent across all instruments and markets by adopting the same day funds convention.

7. A "rolling settlement" system should be adopted by all markets. Final settlement should occur on T + 3 by 1992. As an interim measure, settlement should occur on T+5 by 1990

at the latest, save only where it hinders the achievement of T+3 by 1992.

8. Securities lending and borrowing should be encouraged as a method of expediting the settlement of securities transactions. Existing regulatory and taxation barriers that inhibit the practice of lending securities should be removed by 1990.

9. Each country should adopt the standard for securities messages developed by the International Organisation for standardisation (ISO Standard 7775). In particular countries should adopt the ISIN numbering system for securities issues as in ISO 6166 atleast for cross border transactions. These standards should be adopted by 1992.

Annexure VI

Issue office-wise and bank-wise distribution of currency chests

(As on 30.09.1994)

	Issue Office-wise			Bank-wise	
1.	Ahmedabad	299	1.	Allahabad Bank	14
2.	Bangalore	253	2.	Andhra Bank	13
3.	Bhubaneshwar	107	3.	Bank of Baroda	74
4.	Bombay	46	4.	Bank of India	46
5.	Byculla	49	5.	Bank of Maharashtra	5
6.	Calcutta	161	6.	Canara Bank	80
7.	Guwahati	141	7.	Central Bank	77
8.	Hyderabad	415	8.	Corporation Bank	8
9.	Jaipur	286	9.	Dena Bank	24
10.	Kanpur	516	10	Indian Bank	34
11.	Madras	359	11	Indian Overseas Bank	15
12.	Nagpur	523	12	Oriental Bank of Commerce	6
13.	New Delhi	382	13	Punjab National Bank	118
14.	Patna	160	14	Punjab and Sind Bank	8
15.	Thiruvananthapuram	216	15	Syndicate Bank	26
			16	Union Bank of India	42
			17	United Bank	65
			18	UCO Bank	56
			19	Vijaya Bank	10
			20	Sate Bank of India	1824
			21.	Associates of State Bank of India	1016
			22.	Private Banks	11
			23	Treasury/Sub-Treasury Offices	424
			24	RBI Offices	17
	Total	**4013**		**Total**	**4013**

Contd...

...Contd.

Associates of State Bank of India			Private Banks		
1.	State Bank of Hyderabad	217	1.	Dhanalaxmi Bank	1
2.	State Bank of Travancore	142	2.	Federal Bank	1
3.	State Bank of Mysore	121	3.	South Indian Bank	1
4.	State Bank of Patiala	130	4.	Bank of Rajasthan	1
5.	State Bank of Bikaner & Jaipur	233	5.	Catholic Syrian Bank	1
6.	State Bank of Saurashtra	88	6.	Karnataka Bank Ltd.	1
7.	State Bank of Indore	85	7.	Jammu & Kashmir Bank	5
	Total	**1016**		**Total**	**11**

Annexure VII

Cheque clearing data at metropolitan centres

Annual Cheque Clearing Volume (number in million)

	1990-91	1991-92	1992-93	1993-94	Average annual growth rate
Bombay	126	156	160	169	11.37
New Delhi	56	70	72	78	13.09
Calcutta	33	43	44	47	14.14
Madras	36	42	44	47	10.18
Total	251	311	320	341	11.95

Note: Year is from July to June.

Source: Management Services Department, Reserve Bank of India.

Annexure VIII

List of major commercial centres in India with more than 100 bank offices

(As on 30.06.94)

Centre	No. of Bank offices	Centre	No. of Bank offices
Bombay	1204	Surat	141
Delhi	1096	Ludhiana	140
Calcutta	919	Patna	137
Madras	629	Coimbatore	136
Bangalore	581	Thiruvananthapuram	132
Hyderabad	417	Amritsar	129
Ahmedabad	427	Indore	128
Kanpur	275	Mangalore	123
Pune	259	Bhopal	122
Kochi	179	Jullundur	119
Lucknow	179	Varanasi	116
Jaipur	166	Madurai	109
Vadodara	154	Agra	104
Nagpur	144	Chandigarh	102

Source: Quarterly Handout on Banking Statistics published by Reserve Bank of India

Annexure IX

Network structure of BANKNET

1. The BANKNET comprises Standard CCITT X.25, 1984 recommendations based, private backbone core data transport network, covering seven centres with Packet Switching Exchanges, including built-in PADs at Bombay, New Delhi, Calcutta, Madras and Nagpur and remote PADs at Hyderabad and Bangalore. The X.25 network uses inter-city trunk voice grade data circuits. RBI's four IBM 4381 mainframe computer systems have been connected to nodal Packet Switch Exchanges (PSEs) at four centres through IBM 3720 Front-End Processors using NCP/NPSI (Network Control Program/NCP Packet Switching Interface) for X.25 connection. The IBM systems are used as value-added application processors to provide store-and-collect-oriented messaging service between banks and different offices of the same bank using `Message Transfer Utility' (MTU). This utility has been developed by CMC using General Teleprocessing Monitor for Open System Interconnection (GTMOSI), an IBM supplied utility to connect X.25 Data Circuit-Terminating Equipment to IBM machines (which also provides an Application Programming Interface), the CICS/VS environment and IBM's Virtual Telecommunication Access Method (VTAM).

2. The user banks have the provision to access BANKNET from their premises through leased lines at the respective local centres using asynchronous ports on PADs, PC/UNIX machines with software called COMET (Computerised Message Transfer and File Transfer software). COMET, which provides connectivity to BANKNET, has been developed for DOS, XENIX and UNIX environments.

3. The X.25 Network is based on Codex Corporation Inc. supplied Modulus Series 6525 Packet Switches Exchanges (PSEs), 6505 PADs, 2500 Series Modems with network control cards and the NMS (network Management System) for these modems. At Bombay, New Delhi, Calcutta and Madras there are three 6525 PSEs each connected in tandem. At Nagpur, there are only two 6525 PSEs. Each Switch has 12 ports, six of which can be configured as asynchronous, Mux. or X.25 ports and other six on main CPU card as Mux. or X.25 ports only. Each 6525 packet Switch and 6505 packet Switch and 6505 PAD has approximately 1 MB of memory. The Packet throughput of each packet switch is 300 packets per second (PPS) of 128 byte long packets. The maximum packet size permissible is 1024 bytes. Each X.25 port supports upto 256 nos. of Virtual Calls (VCs), switched or permanent. However, the total number of VCs can not exceed 4096 per nodal switch. Each X.25, 2400 bps inter-city trunk line has been configured for four Permanent Virtual Circuits (PVCs) link per trunk line. The Nagpur Switching node also provides an alternative routing path, in case of failure of any of the main inter-city trunk links. Whereas for Hyderabad and Bangalore, two trunk-links each per location are provided from Madras and the second X.25 network access port of each PAD (Packet Assembler Disassembler) is connected to the X.25 port of other PAD. Thus for Hyderabad and Bangalore, in case of failure of one link, the traffic of that PAD's terminal ports would be routed through its second X.25 network port via the adjacent PAD's other X.25 port and then through the main link of the second PAD to Madras. The asynchronous terminal ports given to the user member banks at Nagpur are hosted by the MTU of IBM system at Bombay, whereas, the Hyderabad and Bangalore users are hosted by the MTU of Madras IBM system.

4. The speed of terminal ports connected to PADs can be configured to operate from 50 bps to 19.2 kbps, whereas, the X.25 ports of packet switches and X.25/Mux, Network access

ports of PADs, can be configured from 1200 bps and up to a speed of 80 kbps. In BANKNET, the asynchronous ports given to the users are working at 1200bps, through the Multitech's 224E/224ER modems of two-wire local intra- city leased lines at each nodal centre. The Multitech modems can support dial-up/leased line. However, Department of Telecommunications (DOT) has not been allowing the use of dial-up lines till recently. DOT has now given approval in principle for Dial-up links. The four-wire inter-city leased trunk lines operate at 2400 bps, using Codex 2525 sync. modems with network control feature. Racal Milgo's `Datacryptors-64' have been used as Link Encryptors, which use Data Encryption Standard (DES) algorithm, to provide security on inter-city trunk lines. On BANKNET, they are used in a point-to-point fashion, with 2 Datacryptors per link, one each between the Codex 2525 modems and 6525 PSEs or PADs as applicable. Thus, one end encrypts and sends the cipher text on the link and the other end decrypts it, to produce the clear text using the same set of keys. As they are rather expensive devices, the Datacryptors have not been employed on intra-city leased line connections to user banks from their respective local Reserve Bank of India centres.

Annexure X

Centrewise distribution of BANKNET ports

Sr. No.	Centre	No. of ports
1.	Bangalore	26
2.	Bombay	45
3.	Calcutta	15
4.	New Delhi	40
5.	Hyderabad	18
6.	Madras	32
7.	Nagpur	16
	Total	**192**

Annexure XI

Profile of SWIFT user group in India

Member/Sub-Member/Participant Statistics (as on December 1, 1994)

i)	Total Members	:30
	Members Live	:28
ii)	Total Sub-Members	:14
	Sub-Members Live	:13
	Total No.of Live Users	**:41**

Number of Bank Branches Listed in

SWIFT BIC Directory	:270
No.of 'A' Category Forex Branches	:181
No.of 'B' Category Forex Branches	:1918

Message Traffic Volumes- Monthly average for 1994

Total No.of Messages Sent	:51,136
Annual Percentage Growth Rate	:64.45%
Total No.of Messages Received	:1,61,796
Annual Percentage Growth Rate	:41.55%

Annexure XII

Shared Payment Network System (SPNS) of Indian Banks Association

1. In the first phase, this network will be set up in Bombay and subsequently it will be spread to other cities in the country.

2. For the present, the following services are proposed to be offered by the system. Additional services will be added on in due course.

   - Cash Transactions
   - Extended hours service
   - Across the bank payments
   - Utility payments
   - Balance enquiry
   - Statement of account
   - Cheque Deposit
   - Request for Cheque book, Standing Instructions
   - Statement of account
   - Point of Sale

3. The project will be set up, owned and operated by the vendor. The vendor will own the Switch (the central host) and the network.

4. There will be a common card for the entire network issued by the member banks who join the network. However, the cards issued by banks who already have a network, will also be accepted by the network.

5. Each participating bank will have a host computer which will be connected to the Switch. Wherever the branches of the card holders are computerised they will be connected to their host

which will enable the network to directly debit the cardholder's account. If the branches are not computerised, then the transactions will be terminated at the host level and the branches will update the database on the host on a daily basis.

6. Besides ATMs, this network will also connect Point of Sale (POS) terminals, Branch Teller Machines (BTMs), cash dispensers, etc.

7. This network will also provide connectivity to international networks such as VISA, Mastercard, AMEX and JCB.

8. Banks will pay transaction fee to the vendor for every transaction that is put through the network. For every transaction from the cardholder of another bank, the acquiring bank (the bank in whose ATM the transaction is put through) will also collect a fee from the issuing bank (the bank which issues the card).

9. ATMs which will be owned by the banks will be positioned,

   inside the branch premises; and
   in public places like railway stations, hospitals, airports, shopping complexes, etc.

10. IBA nominees will sit on the Committee appointed for managing the affairs of the project.

11. IBA would sign necessary agreements with the vendor, on behalf of the banks who are joining the network. All subsequent dealings would be between the concerned banks and the vendor directly. Each bank shall provide a single point contact. There shall be a Network User Group under the aegis of IBA, with members from banks and IBA. For the sake of operational convenience a select committee would be ap-

pointed by the User Group with wide authority in key functional areas.

12. There would be agreements between the IBA and the vendor regarding confidentiality of information. Similarly, there would be agreements between the card holder and the banks for usage, etc.

13. On behalf of the members who are joining the network, IBA would give commitments in respect of number of transactions and number of ATMs for the first few years.

Source: Indian Banks' Association