REPORT OF THE COMMITTEE ON MECHANISATION IN BANKING INDUSTRY

RESERVE BANK OF INDIA
BOMBAY
1984

REPORT OF THE COMMITTEE ON MECHANISATION IN BANKING INDUSTRY

RESERVE BANK OF INDIA
BOMBAY
1984

Price

Inland : Rs. 27.00 (Post free)
Foreign : US$ 10.00 (Post free)

Available from

The Director (Administration),
Department of Economic Analysis and Policy,
Reserve Bank of India,
Post Box No. 1036,
New Central Office Building,
Mint Compound,
Bombay - 400 023.

Cheques/Drafts should be drawn in favour of the
Reserve Bank of India, Bombay, India.

Published by : Reserve Bank of India, Bombay.
Printed by : United Arts, Shivshakti, B. G. Kher Road, Worli, Bombay - 400 018

REPORT OF THE COMMITTEE ON MECHANISATION IN BANKING INDUSTRY

CONTENTS

CHAPTER I

INTRODUCTION

1.1 Since the introduction of social control over banks in 1968 and more particularly since the nationalisation of 14 major commercial banks in July 1969, the banking industry in India has undergone a phenomenal transformation. The industry has grown, not only in terms of the size of its operations and the number of bank branches, but also in terms of its functional diversification. There has been more than a four-fold increase in the number of bank branches, with a six-fold expansion in deposits, a five-fold increase in advances and a five-fold rise in the number of borrowal accounts. As at the end of the Seventies, the banking industry had more than ten million customers, with an estimated three million transactions and one million inter-branch transfers per day.

1.2 Simultaneously, this growth generated acute needs of complex information systems for house-keeping, audit and control by the internal management of banks, on the one hand, and macro-level information for policy formulation and control by the Central Banking Authority — the Reserve Bank of India — and the Government, on the other. These information systems had their primary inputs originating in bank branches. With a host of organisational problems and multiplicity of statistical returns, serious bottlenecks developed in the early Eighties in the flow of information from branches to head offices. It has also created a situation of abundance of large volumes of out-dated and unprocessed data and scarcity of vital current data needed for the fine tuning of policy measures.

1.3 It is ironic that, despite the multidimensional growth of the industry, which is possibly unparalleled in any developing country, the banking industry remained completely insulated from mechanisation. With the sole exception of the State Bank of India, none of the banks could employ on a large scale even the simple mechanical aids to improve the efficiency of their operations. A number of Working Groups and Committees were appointed during the last 6-7 years by the Reserve Bank of India and the Government to look into problems facing the banks and to evolve guidelines for implementation of various schemes, particularly those designed to align the credit plans of banks with development schemes under the Five-year plans. These Working Groups/ Committees recommended introduction of mechanisation/computerisation as an aid to generation of information systems. Given the magnitude and complexity of the tasks before the banking system, mechanisation was considered as inevitable for improving customer services, improving house-keeping and control over branch operations, and generating speedily policy-oriented information.

1.4 Introduction of mechanisation/computerisation for different functions in different tiers of the banking industry required a close look at banking practices and procedures and formatting of books of accounts to make them amenable for mechanisation. The question of secrecy and

security of books of accounts had a special significance in the banking industry. As non-availability of trained manpower and lack of necessary infrastructure through the network of bank branches could prove to be a serious constraint in the programme of mechanisation, a phased approach would have to be adopted.

1.5 To study all these problems, the Reserve Bank of India appointed, in July 1983, a Committee on Mechanisation in Banking Industry to consider the question of drawing up a phased programme of mechanisation for the banking industry, bearing in mind its future expansion.

The composition of the Committee was as follows :—

1.	Dr. C. Rangarajan, Deputy Governor Reserve Bank of India Bombay	Chairman
2.	Shri M. N. Goiporia, Chairman Dena Bank Bombay	Member
3.	Shri N. Vaghul, Chairman Bank of India Bombay	Member
4.	Shri H. C. Bhambhani, Deputy Managing Director State Bank of India Bombay	Member
5.	Shri Arun Sinha, Joint Secretary Government of India Ministry of Finance (Banking Division) New Delhi	Member
6.	Dr. N. Seshagiri, Director Government of India Department of Electronics New Delhi	Member
7.	Dr. R. Bandyopadhyay, Director National Institute of Bank Management Bombay	Member

8.	Dr. Y. B. Damle, Adviser Management Services Department Reserve Bank of India Bombay	Member
9.	Shri U. K. Sarma, Chief Officer Department of Banking Operations and Development Reserve Bank of India Bombay	Member
10.	Dr. J. K. Satia, Professor Indian Institute of Management Ahmedabad	Member
11.	Shri S. P. Gothoskar, Adviser Department of Statistical Analysis and Computer Services Reserve Bank of India Bombay	Member— Secretary

Shri Vaghul was the Chairman-cum-Managing Director, Bank of India, till 31st December 1983 and thereafter continued to be the member of the Committee in his individual capacity. Shri Bhambhani retired from the State Bank of India from 1st March 1984 and thereafter, Shri S. Padmanabhan, Deputy Managing Director, State Bank of India, served on the Committee. Shri Arun Sinha relinquished the charge of the Joint Secretary from 1st February 1984 and thereafter Shri Ashok Kumar, Joint Secretary, became a member of the Committee. Dr. K. Subramanian served as alternate member to Dr. Seshagiri.

1.6 The terms of reference of the Committee were :

i) Identify the areas/functions where mechanisation in banks will be essential, including extent of mechanisation necessary at bank branches, regional offices/head offices;

ii) Examine formats of various types of records/ledgers etc., and data flow channels and suggest modifications required therein for efficient mechanisation;

iii) Suggest a phased programme of mechanisation/computerisation in different areas of work and different tiers of bank offices;

iv) Suggest standardised procedures in various areas of work and examine the feasibility of having common processing arrangements for all banks at selected focal points;

v) Recommend appropriate types of equipments suitable for various types of processing;

vi) Recommend the infrastructure needed to ensure smooth data flow and for operation and maintenance of the equipment;

vii) Recommend appropriate steps so that exchange of information through suitable computer media between different banks and the Reserve Bank of India is possible;

viii) Suggest appropriate security arrangements in data flow and their processing; and

ix) Make any other recommendations which are incidental or related to the above terms of reference.

1.7 The first meeting of the Committee was held on 18th August 1983. In the next five meetings, the Committee discussed the functional areas to be mechanised/computerised and the type of mechanisation that would be needed in the different tiers of banking industry and other issues related to mechanisation. The Committee also appointed two Sub-Committes to look into problems of inter-branch reconciliation and systems design for the apex level computerisation in banks. In the meantime, in September 1983, the Indian Banks' Association reached an agreement with the All India Bank Employees' Association on the question of introduction of mechanisation/ computerisation in banking industry. The various provisions of this agreement were kept in view by the Committee during its deliberations.

1.8 The Report is divided into nine chapters, besides this introductory Chapter. The growth of banking industry and its current problems in developing information systems, which have necessitated mechanisation/computerisation, are discussed in Chapter II. Chapter III identifies the objectives and areas for mechanisation at the branch, zonal and head office levels. The type of mechanisation needed in the branches is discussed in Chapter IV. Computer support for management information system of loans and advances by banks is examined in Chapter V. Chapter VI deals with the cheque clearing systems. Computerised information systems on foreign exchange dealings of banks are dealt with in Chapter VII. Computer systems for the head offices/zonal offices of banks and the items of work to be handled on the systems are described in Chapter VIII. Chapter IX gives estimates of various resources needed for implementing the programme of mechanisation recommended by the Committee and advance actions to be initiated by banks. A summary of the report and recommendations made in every Chapter is given in Chapter X.

1.9 The Committee was assisted by two Sub-Committees. Sarvashri C. K. Bapiraju of the State Bank of India, K. Raghunathan of Dena Bank, D. K. Rao of Bank of Baroda, and A. F. Langarana of Union Bank of India worked on the Sub-Committee to examine problems in computerisation of reconcilation of inter-branch transactions. Sarvashri R. Raman of the State Bank of India, C. S. Naidu of National Institute of Bank Management, Y. D. Potnis of Bank of Baroda, Smt. V. V. Desai of Bank of India and Smt. Harsha Palav of Central Bank of India worked on the Sub-Committee for computerisation of various items in the functioning of head offices/zonal offices of banks. Shri P. B. Rao, Director in the Department of Statistical Analysis and Computer Services of the Reserve Bank, assisted by Shri R. Sethuraman and Smt. P. Kunhiraman provided the secretarial support to the Committee. The Committee wishes to record its grateful thanks to all these officers, for completion of their work in a short time.

1.10 The Committee wishes to place on record its deep appreciation of the services rendered by the Member-Secretary, Shri Gothoskar. He brought together all the relevant data, analysed them and presented them to the Committee in a way that the members could take a decision after understanding fully the pros and cons of each recommendation. His deep knowledge of the computers coupled with his understanding of the operations of the banking system was a great asset to the Committee.

CHAPTER II

GENESIS OF THE PROBLEM

2.1 Issues relating to mechanisation/computerisation in banking industry are closely related to the growth of the industry and diversification of its activities during the last decade, on the one hand, and the requirements of information systems for administration, control and policy formulation, on the other. The following paragraphs review briefly the developments during the last decade on these two aspects of the industry.

2.2 The period 1967-69 provides an important landmark in the growth of banking industry in India. A major conceptual change took place with the introduction of social control measures in 1968, followed by nationalisation of 14 major commercial banks in 1969. The industry, which had till then mainly serviced purely on commercial basis a selective and organised clientele in trade, commerce and industry in metropolitan and other important cities and towns in India, was now required to play an effective role in accelerating the economic development process initiated by the Five-year plans. As a matter of policy, a deliberate thrust was made by extending branch network to unbanked centres and by making credit available to the unorganised and weaker sections of the society.

2.3 This massive programme of extension saw a complete transformation of the banking industry. The number of banks had already shrunk to 86 in June 1971, from 566 at the end of 1951, as a result of the process of weeding out weak and non-viable units. The number of bank branches had increased to only about 9,000 by the end of 1969, as against 4,200 in 1951. But in the next fourteen years, the number of branches increased to about 45,700. Bank deposits, which stood at about Rs. 900 crores in December 1951, had grown to about Rs. 5,700 crores at the end of December 1970 and reached as high as Rs. 37,000 crores in 1980. Currently, the deposits have surpassed Rs. 63,000 crores. Bank advances, too, grew from about Rs. 600 crores to Rs.4,450 crores in the first two decades and further to Rs. 25,000 crores at the end of the third decade. At present, bank credit exceeds Rs. 41,500 crores. The most notable development was in borrowal accounts, which increased from around one million in 1968 to twenty million in 1980, a substantial portion of the increase being in small borrowal accounts spread throughout the country.

2.4 This tremendous growth in banking business was also accompanied by several organisational changes. The number of bank employees had almost trebled, from 79,000 at the end of 1956 to 2,20,000 at the end of 1969. At the end of 1980, it had reached 5,94,000. Under the Lead Bank scheme introduced in 1969, banks adopted an "area approach" and the districts in the country were allotted to public sector banks in which they were expected to play the lead role in deposit mobilisation and formulation of district credit plans. The "head office — branches" structure, which had a high degree of concentration of power in head offices, was changed to a three or four tier structure — head office, zonal/regional office and the branch — with a greater measure of

decentralisation. The head/central offices of banks now mainly concentrated on matters of corporate policy, planning and follow-up, the operational duties being assigned largely to regional/zonal offices.

2.5 The post-nationalisation period also witnessed diversification of the activities of banks. A substantial portion of credit was channeled to priority sectors, with emphasis on lendings to unorganised and weaker sections of the population. Banks were now assigned targets to be achieved under different schemes. Apart from these, banks diversified their activities under merchant banking, overseas operations and other financial services to their customers.

2.6 The above deveopments, stimulated by deliberate policy measures, emphasised the need for speedy and comprehensive information systems for policy formulation, performance appraisal, and budgetary and control purposes. It would not be out of place to take a brief review of the evolution of these information systems.

2.7 Before the nationalisation of 14 major commercial banks in 1969, all the information systems in banks were designed mainly to subserve accounting and control purposes and the information flow from branches to head offices of banks was fairly smooth. The branches did not feel any "burden" in balancing the books of accounts or in filling up statistical returns nor did the head offices any "problem" in submission of statutory returns. The Reserve Bank returns concentrated mainly on the assets and liabilities of banks and their break-up.

2.8 This information system was reviewed by the Reserve Bank of India first in 1957 and then in 1966. With the advent of social control and the Lead Bank scheme, the scope of the information systems was required to be widened considerably, particularly in respect of data on advances by banks. A Working Group on banking statistics set up by the Reserve Bank in 1968 recommended introduction of Uniform Balance Books (UBB returns) for the branches. With the introduction of these returns, an attempt was made to collect branchwise and accountwise information in respect of bank advances. The UBB returns, however, met with partial success and in 1972, they were replaced by Basic Statistical Returns (BSR).

2.9 In the early Sixties, the Reserve Bank introduced a Credit Information System under which the banks were required to submit quarterly returns on partywise advances made by them, which exceeded certain limits. The information system was reviewed and modified in 1973. The periodicity was changed to six months and the returns were formatted on the lines of Basic Statistical Returns. While the Credit Information System encompassed individual secured advances exceeding Rs. 5 lakhs and unsecured advances exceeding Rs. 1 lakh, the Reserve Bank also introduced in 1965 a Credit Authorisation Scheme to cover borrowers who enjoyed credit limits of Rs. 1 crore or more from the banking system. Banks were required to submit monthly returns to the Reserve Bank on advances to parties covered under the Credit Authorisation Scheme.

2.10 The Banking Commission appointed by the Government of India in 1969 took a close look at the Management Information System in banks. A Study Group was set up in the National Institute of Bank Management (NIBM) to examine in depth banking information systems and data

processing needs of industry. The NIBM Study Group reported in 1972 that there was little coordination among the agencies asking for information from banks and the entire exercise of compiling data was so delayed that it totally lost the utility of information. It recommended information systems designed on a functional basis and suggested decentralised data processing organisation to capture and process statistical information. The Banking Commission, in its report submitted in 1972, spelt out the framework within which banks were to develop their information systems.

2.11 A Study Group (Tandon Committee) was set up in 1974 to frame guidelines to banks for the follow-up of credit. It prescribed a set of returns to be submitted by borrowers to evaluate the operating results of the activities of borrowers and utilisation of credit. The intention was to link business production plans with credit extension by the banking industry.

2.12 The large scale expansion of bank branches and the additional responsibilities given to Lead Banks in district credit plans gave rise to a number of problems and the Reserve Bank of India set up a Committee (James Raj Committee) in June 1977 to review the functioning of Public Sector Banks. The Committee observed that, even though banks had well designed systems and procedures, there was no adequate implementation because of lack of supervision and prompt follow-up.

2.13 By this time, the banking services were fully geared to development plans and a number of statistical returns with different periodicity and varying measure of details were introduced. Credit information system was made more broad based for close monitoring of schemewise and purposewise performances with regional level breakups, as well as for watching the fulfillment of statutory provisions.

2.14 Though the needs of information systems internally within banks and externally by the Reserve Bank of India and the Government had increased enormously and the branches were being asked to supply numerous statistical returns, the branches found it difficult to compile and furnish information within the stipulated time. The various books of accounts maintained by branches are required to be balanced periodically, ranging from a day to day basis to monthly/six monthly basis. But in more than one-third of the branches, there were serious delays in balancing and, as long as the books were not balanced, statistical and statutory returns could not be filled up properly. Final (revised) data under the weekly Section 42(2) Return, which is the most crucial return for knowing compliance of various statutory provisions, had a time lag of four to six months. The monthly Form X return, giving the details of assests and liabilities of banks was delayed by about six months. Monthly returns on advances to sick units were delayed upto eight to ten months. The half yearly returns on advances to priority sectors and Lead Bank returns were also subject to inordinate delays. Even with one year delay, the Lead Bank returns showed only 50 per cent response. The average delay in Basic Statistical Returns was six months. The Credit Information System and Credit Authorisation Scheme, which monitored individual account level information were handicapped because of the enormous delays in receipt of information. The Subbarao Committee appointed by the Indian Banks' Association measured the productivity of banks in terms of delays in balancing of books and late submission of returns and came to the conclusion that computerisation was the only solution to the problem.

2.15 During the years 1981 and 1982, the Reserve Bank set up three Working Groups on (i) accounting procedures and maintenance of branch level records, (ii) review of the working of Lead Bank scheme and (iii) role of banks in implementation of new Twenty Point Programme. All these Working Groups came to the conclusion that mechanisation was inevitable for speedy information systems. They also noted that branch level records needed reformatting in order to provide inputs to information systems.

2.16 The Goiporia Committee on accounting procedures and maintenance of records at bank branches recommended maintenance of scheme-wise supplementaries in branches which could provide a direct input to the information system. It also recommended that a Committee might be appointed to examine in depth the problem of mechanisation/computerisation in banks. After examining the complexity and multiplicity of statistical returns, the Committee observed that branches were submitting more than 100 returns and, taking into account the periodicity, the workload came to 1,300 returns per year.

2.17 The above discussion would indicate that, with the growth of banking industry, not only the information systems had to be restructured in regard to their contents, but the methods of capture of data at the branch level and their subsequent transmission through different tiers of the banking system had to be modernised. With the enormous branch expansion, the ever widening range of activities and the responsibilities thrust on the industry, the available trained manpower was under considerable strain. Following the introduction of schemes directed towards specific sections of the population, statistical returns on schemewise performance proliferated. Branches complained that there were too many returns asking for the same type of information in slightly different formats.

2.18 The Study Group appointed by NIBM in 1972 had estimated the data processing needs of banking industry in the light of management information system it had designed. Considering the then available technology in India and the cost of various types of equipments, the Group had recommended that the branches should be equipped with adding/accounting machines with special attachment for punch cards/computer tapes. Regional data processing centres were recommended at Bombay, New Delhi, Calcutta, Madras, Bangalore and Ahmedabad. The data processing centres to be jointly owned by banks were to work on a service bureau basis. Their administration was to be under an autonomous corporation to be run on commercial basis. Clearing operations were to be mechanised and a National Clearing Authority established. The banks were asked to establish computerised data banks.

2.19 The Banking Commission, besides making recommendation on procedural modifications in banking practices, had recommended cash registering machines and other types of posting machines for the branches. But hardly any progress was made in this direction during the Seventies. The various other Working Groups/Committees mentioned earlier had also made recommendations on mechanisation of banking industry. The Talwar Committee on Customer Services in Banks appointed in 1976, had made recommendations on mechanisation of certain functions to avoid delays in customer services. It also recommended computerisation of clearing houses. The Lead Banks Working Group had recommended computer facilities not only in the head offices of banks but also in regional/zonal offices on a dispersed basis. The James Raj

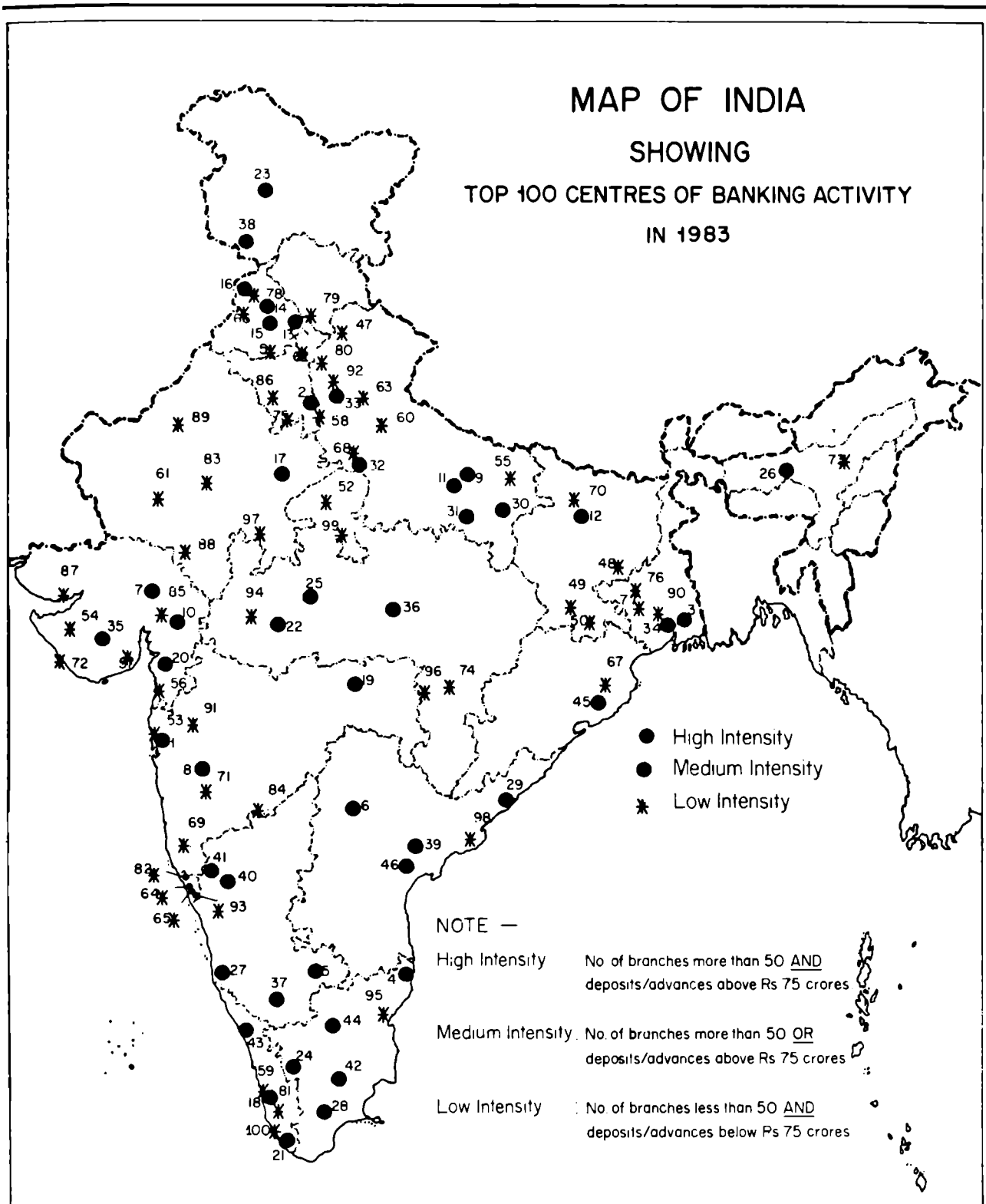
Committee felt that, in order to improve operational efficiency and quality of service, a judicious use of computers for selected services would be advantageous for banks in ensuring better financial management and higher profitability. However, within the scope of their terms of reference, these recommendations were generally peripheral in nature.

2.20 It must be conceded that banks were well aware of this critical situation in information systems and made several attempts to instal mechanical aids for capture and processing of data. But in the then prevailing environmental conditions. the plans for mechanisation could be implemented only on a very limited scale. According to the first bipartite settlement of 1966 between the Indian Banks' Association and the All India Bank Employees' Association, Ledger Posting machines for ledger posting and statement of accounts were to be installed in branches and unit record equipments in head offices. Specific agreement was provided for each function to be mechanised. However, employees' unions all along resisted mechanisation. In 1980, the dispute in regard to mechanisation/computerisation in banks was referred to the Board of Arbitrators, along with a few other issues. However, the arbitration could not be continued on technical grounds.

2.21 A major breakthrough in this impasse on the question of mechanisation came with the significant decision given by the National Industrial Tribunal (Dighe Award) towards the end of 1981. In the industrial dispute between the management of the Reserve Bank and their workmen, the issue of mechanisation and computerisation was discussed in detail before the National Industrial Tribunal with reference to the functional areas of working to be supported by various types of machines and computers. The Reserve Bank of India argued that, apart from the need for mechanisation/computerisation for improved internal housekeeping, better customer service and proper discharge of its obligations as the Central Banking Authority of the country, mechanisation/computerisation would also result in increased efficiency of individuals and effective utilisation of staff and bring better job satisfactions and greater pride in work to all categories of bank employees. The representative Association/Unions of the employees opposed computerisation on the ground of displacement/retrenchment of staff and reduction in job opportunities. The Tribunal gave an unequivocal award in favour of the use of computers and other sophisticated machines in various functional areas enumerated by the Bank, with the proviso that it should not cause displacement of more than ten per cent of staff. More machines were allowed to be used in different departments of the Bank and minicomputers were allowed for operational and control purposes. Subsequent to this Award, the Reserve Bank has gone ahead with the computerisation of clearing houses and has also installed ledger posting machines.

2.22 Around this time, the Indian Banks' Association took up the issue once again with the All India Bank Employees' Association and reached an agreement in September 1983, under which electronic ledger posting/accounting machines, microprocessors/minicomputers and mainframe computer systems were allowed to be installed to support specified functional areas in branches/zonal and head offices of banks, subject to certain conditions. The settlement specifies that accounting machines with attached memory modules may be utilised in banks for the purposes of current accounts, deposit accounts, general ledger accounts, cash credit and loan accounts in urban and metropolitan areas. Computers including minicomputers are allowed for clearing operations, inter-branch reconciliation, remittances, foreign exchange dealings,

investment management, personnel inventory, pay rolls and provident funds, merchant banking and management information systems on credit, budgetary data and annual closing returns. This agreement is valid for three years, but it is open to individual banks to extend the scope of computerisation during this period by reaching an agreement with their own recognised unions. A stage has thus been reached in which commercial banks will be able to extend mechanised/computerised support to various operational areas, housekeeping and management information systems.


MAP OF INDIA
SHOWING
TOP 100 CENTRES OF BANKING ACTIVITY
IN 1983
High Intensity
Medium Intensity
Low Intensity
NOTE —
High Intensity No. of branches more than 50 AND deposits/advances above Rs 75 crores
Medium Intensity No. of branches more than 50 OR deposits/advances above Rs 75 crores
Low Intensity No. of branches less than 50 AND deposits/advances below Rs 75 crores

LIST OF TOP 100 CENTRES CLASSIFIED ACCORDING TO INTENSITY OF BANKING ACTIVITY (ranked as per deposits)

High intensity centres

1. Bombay
2. Delhi
3. Calcutta
4. Madras
5. Bangalore
6. Hyderabad
7. Ahmedabad
8. Pune
9. Lucknow
10. Vadodara
11. Kanpur
12. Patna
13. Chandigarh
14. Jalandhar
15. Ludhiana
16. Amritsar
17. Jaipur
18. Cochin
19. Nagpur
20. Surat
21. Trivandrum
22. Indore
23. Srinagar
24. Coimbatore
25. Bhopal
26. Gauhati
27. Mangalore
28. Madurai

Medium intensity centres

29. Visakhapatnam
30. Varanasi
31. Allahabad
32. Agra
33. Meerut
34. Howrah
35. Rajkot
36. Jabalpur
37. Mysore
38. Jammu
39. Vijayawada
40. Dharwar
41. Belgaum
42. Tiruchirapalli
43. Kozhikode
44. Salem
45. Bhubaneswar
46. Guntur

Low intensity centres

47. Dehradun
48. Dhanbad
49. Ranchi
50. Jamshedpur
51. Patiala
52. Gwalior
53. Thane
54. Jamnagar
55. Gorakhpur
56. Navsari
57. Bhavnagar
58. Ghaziabad
59. Trichur
60. Bareilly
61. Jodhpur
62. Ambala
63. Moradabad
64. Panaji
65. Margoa
66. Phagwara (Punjab)
67. Cuttack
68. Aligarh
69. Kolhapur
70. Muzaffarpur
71. Pimpri-Chinchwad
72. Porbunder
73. Duliajan (Assam)
74. Raipur
75. Faridabad
76. Asansol
77. Durgapur
78. Hoshiarpur
79. Simla
80. Saharanpur
81. Kottayam
82. Mapuca
83. Ajmer
84. Sholapur
85. Anand
86. Rohtak
87. Gandhidham
88. Udaipur
89. Bikaner
90. Burdwan
91. Nasik
92. Muzaffarnagar
93. Vasco-da-Gama
94. Ujjain
95. Pondicherry
96. Bhilai
97. Kotah
98. Kakinada
99. Jhansi
100. Quilon

CHAPTER III

IDENTIFICATION OF AREAS FOR MECHANISATION

3.1 Introduction of computers in India began in a small way in the early Sixties. The Life Insurance Corporation was possibly the first to introduce, in 1963, computerisation for maintenance and processing of insurance policies. During the years 1967 to 1971, about 100 computers were installed in different organisations in India, but only two of them were located in banking industry viz., Reserve Bank of India and State Bank of India. Use of computer in the Reserve Bank was restricted to statistical reports and research. In the State Bank of India, it was used for reconciliation of inter-branch transactions.

3.2 According to the first bipartite settlement of 1966 between the Indian Banks' Association and the All India Bank Employees' Association, it was agreed that IBM or ICT Accounting Machines and National Cash Registers could be used in banks for specific functions like ledger and statement posting of deposit accounts, general ledger accounts, reconciliation of interbranch accounts and also for processing pay rolls and provident fund accounts. However, not much progress was made in the use of either the ledger posting machines or unit record equipments, which are possibly the lowest version in computer technology.

3.3 It would not be out of place to review the experience of banks which are now having their own in-house computer systems or are engaging outside computer agencies on a contract basis. At present, only the State Bank of India is having a medium-size computer system which is being used mainly for reconciliation of inter-branch transactions (IBR), processing of Basic Statistical Returns, settlement of government and agency transactions and reconciliation of Government accounts and traveller's cheques. A few other banks have installed micro-computer systems in their head offices. Most of the banks have been engaging outside computer agencies for some limited work. Typically, the items of work handled on computer systems are reconciliation of inter-branch transactions, processing of statistical returns like the BSR and Section 42(2) Return and administrative services such as pay-roll processing, and provident fund accounting.

3.4 The largest single item processed at present through computers is reconciliation of inter-branch transactions. However, the experience of banks in this regard cannot be considered wholly satisfactory which is essentially due to the fact that several attending procedures, preceding and following the computerised reconciliation have to be carried out manually. The computer exercise itself is undertaken with a time lag of six months to two years and there is a further delay in the follow up of mismatched entries. This experience of banks clearly shows that computerisation of only the matching exercise in isolation and without appropriate linkages with the branch level systems is unlikely to yield the desired results.

3.5 It is thus seen that, even the limited use of computers has not yet made any dent either in

reducing the time lag in generation of information system or in improving operational efficiency. In any organisation, particularly a banking organisation with a large network of operating branches where the data originate, computerisation at the apex level alone cannot achieve much unless supported by well-aligned mechanised links to ensure smooth and prompt data flows. This past experience would suggest that a careful planning in methods and procedures for data capture and their transmission will have to be made and computer systems in head offices will have to be supported by a network of machines for data capture at the branch level and their transmission.

3.6 With the explosive increase in the activities of banks and wider geographical coverage, a degree of mechanisation has become essential if the basic functions of banks such as services to customers (depositors and borrowers), uptodate maintenance of various general ledger accounts and reconciliation of transactions among branches, and generation of required data for control and monitoring are to be performed efficiently. The process of mechanisation in the banking industry will have to be such, as to include activities at the branch, regional and head office levels with the emphasis varying from one level to another. At the branches, the main objectives of mechanisation ought to be improvement in customer service, quality of housekeeping and generation of data to meet the requirements of control and information systems. Due to the increase in volume and complexities of banking business, these have become the principal casualties during the last decade. At the regional and head office levels, the purpose of mechanisation would be to store, analyse and retrieve the data received from branches, so as to generate speedy information for strengthening internal control over branches and for policy formulation.

3.7 The systems will have to be so designed as to ensure generation of data as a by-product of the operations at the branch level. Control and information needs have suffered due not so much to difficulties in analysis of data as to the inability of branches to submit particulars in time. Difficulties at the branches arise principally from the snapping of link between the accounting system, the main functions of which have remained unchanged since the Thirties, and the information system needed in the post-nationalisation era. The parameters on which information is required have grown so vast that they can no longer be fitted into a manual accounting system. There is, therefore, a need to evolve a partially machine oriented system under which data are captured at the transaction stage and transmitted with the aid of appropriate technology, not only for updating the relevant accounts but also for simultaneously generating the information needed.

3.8 The plan of mechanisation/computerisation in banks is closely linked to the functions discharged in different tiers in the organisation. A review of the organisational set-up of different banks shows that the small banks are having a three-tier structure, viz., branch, regional office and head office. In large size banks, a four-tier structure is adopted with a zonal office functioning between the regional offices and head office. At the apex level, there is the head office while in the second tier there is zonal office (also called as circle office or local head office or regional office). The divisional offices (also called as area offices or regional offices) function in the third tier and the branches form the fourth tier. The head office of a bank is organised into divisions/departments on a functional basis in different areas of banking operations. Corporate planning and policy formulations, monitoring and review of institutional performance are the responsibilities of head office. Besides, audit and inspection of branches and other offices is a direct responsibility of the head offices in most of the banks.

3.9 Zonal and regional offices are organised on a geographical basis, depending upon the concentration of branches within the respective areas. Generally a regional office in the third tier would supervise the working of about thirty to fifty branches, while the second tier zonal office supervises the working of three to five regional offices. In some banks, the zonal offices are organised on the lines of head office structure with emphasis on operational areas. The zonal and regional offices share the responsibilities for planning, development, control over credit operations, personnel management and training and administrative services. The discretionary, administrative and lending powers are delegated to officers in the four tiers in terms of the size of financial commitment/liability that is involved in the decision making process. In the zonal/-regional offices located in State capitals/district headquarters, processing of data as such is minimal. As the bulk of transactions originates in branches, it is the function of zonal/regional offices to control and supervise branch operations, ensure follow-up of head office instructions, and monitor the receipt and scrutiny of branch level data for control and onward transmission to head office. Apart from these activities, certain types of branch level transactions are controlled in the form of sanctions by zonal/regional offices and data on these transactions are maintained by these offices to facilitate their subsequent follow-up.

3.10 Identification of areas for mechanisation rests on three considerations, viz., (i) volume and type of data required to be captured, (ii) objectives of information to be extracted from these data and the type of processing involved and (iii) form in which these data are to be stored and retrieved subsequently. At the branch level, primary data get recorded as transactions are executed. The same data get independently recorded at least in two books of accounts and, after their balancing, macro-level data for the branch as a whole are transmitted. In the compilation of statistical returns, transaction level data are classified and summarised. For administrative offices two types of data bases are required. Internal data base is built from operational statistics culled out from various books of accounts. With the diversification of their business, banks are now required to maintain an equally large external data base on economic, financial and monetary statistics on domestic as well as foreign economies. These data bases are required to be formatted to serve the dual purposes of providing economic analysis for long term planning and giving indicative signals over a short term.

3.11 The main objective of mechanisation at the branch level should be (i) improvement in customer services, (ii) improvement in house-keeping operations and (iii) speedy transmittal of statistical data for generating management information systems. Improvements in customer services will be in the nature of expeditious processing of transactions at the counter, prompt execution of standing and ad-hoc instructions given by customer, speedy clearance of cheques, transfers, etc., and accurate generation of statements of accounts, including product and interest calculations. Prompt and accurate posting of entries in different books of accounts and their balancing as well as compliance with various requirements of audit and accounting procedures would lead to improvements in house-keeping operations. To improve the efficiency of management information systems, the branches will have to evolve methods for classifying and summarising data in various formats.

3.12 A review of banking procedures and data on volume of transactions would suggest that, at the branch level, there are three areas which can be supported by functional machines. The first

type of machines would support cash transactions. One could consider for this purpose the cash registers which are already in use in some banks. The second type of machines would support making data entries in various books of accounts, their summarisation and final balancing. Periodically, the machine may be used in working out product and interest accrued on customers' accounts. These machines should also generate transactionwise listing, wherever needed, e.g., preparation of schedules of interbranch transactions. Entry of data into banking records at a single point and their automatic registering in different books/formats would eliminate errors of posting, etc., and solve the problem of balancing. The third type of machines would support scanning of cheques and their machine sorting. These machines would facilitate physical sorting of cheques lodged for clearance and credit into customers' accounts and prepare the necessary scrolls.

3.13 Zonal/regional offices provide an intermediate link between branches and the head office. The main function of these offices is to monitor receipt of data and summarise them in the desired formats. They will also be required to keep profiles of certain transactions for their follow up. Small microprocessor systems with adequate numbers of data entry terminals could support these operations. The objectives of this type of mechanisation are two fold: (i) to capture data on computer media such as floppy discs or tapes and validate/edit them for generating information for control and follow up purposes, and (ii) to transmit these data for direct input to mainframe computer systems in the head offices.

3.14 The main objective of mechanisation in the head office should be (a) orderly storage of data in meaningful formats and facilitate their retrieval, (b) analysis of data to exercise control and audit checks, (c) generation of reports for management, policy formulation and evaluation of performance and (d) maintenance of external data base on domestic and international economies. In addition, efficiency of administrative services can also greatly be improved with mechanisation. Bulk of these data would need batch processing. However, in the case of money market operations and foreign exchange dealings whether handled in head offices or in selected branches, some real time processing may be involved.

3.15 The main batch processing jobs on the head office computer systems would be reconciliation of inter-branch transactions, weekly statement of affairs, Basic Statistical Returns and performance of branches. The system will maintain deposit profiles of branches, as also profiles of loan accounts and borrowers in various categories. Another important area to be supported by computer system will be investment management, profit and loss and balance sheet statements, and cash management. Administrative services in the form of personnel inventory, pay roll and provident fund statements, directory of instructions and directives issued by controlling authorities and their compliance/follow up will be another area for computerisation. The system will also maintain economic and financial data base. Moreover, some branches will need real time processing systems for foreign exchange dealings and money market operations. The system would calculate yields in these dealings, keep profiles of certain transactions, and work out maturity schedules of assets and liabilities.

3.16 Another type of mechanisation which will be useful for banks is microfilming equipment. One of the major problems faced by branches in urban and metropolitan areas is the lack of office space. With increasing volume of work, branches have to find space not only for the staff but also

for the ever increasing volume of documents. Banks are required to preserve all the passed vouchers, cheques, etc., for a minimum period ranging from five to ten years. In many branches, bundles of these old instruments are dumped in such a way that retrieval of a particular document needed becomes practically impossible. Modern technology gives a solution to this problem in the form of microfilming. The microfilm document requires as little as 2% of the space that would be used by the same number of documents kept in the original form and retrieval of any required document can also be done in a matter of minutes. Other advantages of microfilming are (i) file integrity — no misfiling, alterations, loss, etc., (ii) security, (iii) reversion to paper form — a paper copy of a microfilm can be produced immediately whenever required, (iv) lower operating costs and (v) improved customer service, etc. Many models of microfilming equipment are available indigenously and, in big cities, these are available on service basis also.

3.17 Any plan for mechanisation/computerisation of banking industry will have to take into consideration the spatial distribution of branches and size of their business. This distribution shows that a major part of banking business is concentrated in about 3,000 branches located in some 100 centres. This could prove to be advantageous in capturing a major portion of the information by spreading the net-work of mechanisation in these centres in the first instance. On the other hand, mechanisation could be uneconomic in smaller branches. In such cases, the manual systems will have to be aligned to the mechanised systems in other branches. An analysis of the volume and pattern of business and its geographical distribution would also indicate how a phased programme of mechanisation can be chalked out. This phased programme is indicated in Chapter IX of the Report.

CHAPTER IV

BRANCH LEVEL MECHANISATION

4.1 A typical bank branch set up is described in Chart I. The lay-out is functional and the inputs/outputs of different sections in a branch are cross-tallied to ensure accounting checks. The different functions carried out on a day to day basis in a typical branch of a bank can be classified as (a) counter level transactions involving recording of entries in scrolls and primary ledgers, and in and out movement of cash, (b) exchange of documents with other branches and offices, and (c) recording of entries in internal books of accounts and final balancing of day's transactions through the media of supplementaries, day books, general ledger, etc. In addition, there are ancillary functions of scrutiny and verification of documents, calculation of interest accrued on different accounts, correspondence, compiling statistical returns, inspection, etc. On a rough basis, it is estimated that direct dealings with customers at the counters take up about 40-45 per cent of available manhours in the branch and about 30-35 per cent of the time is utilised in writing and checking supplementary books of accounts, general ledger and balancing of books, while the remaining time is used up in miscellaneous and ancillary items of work.

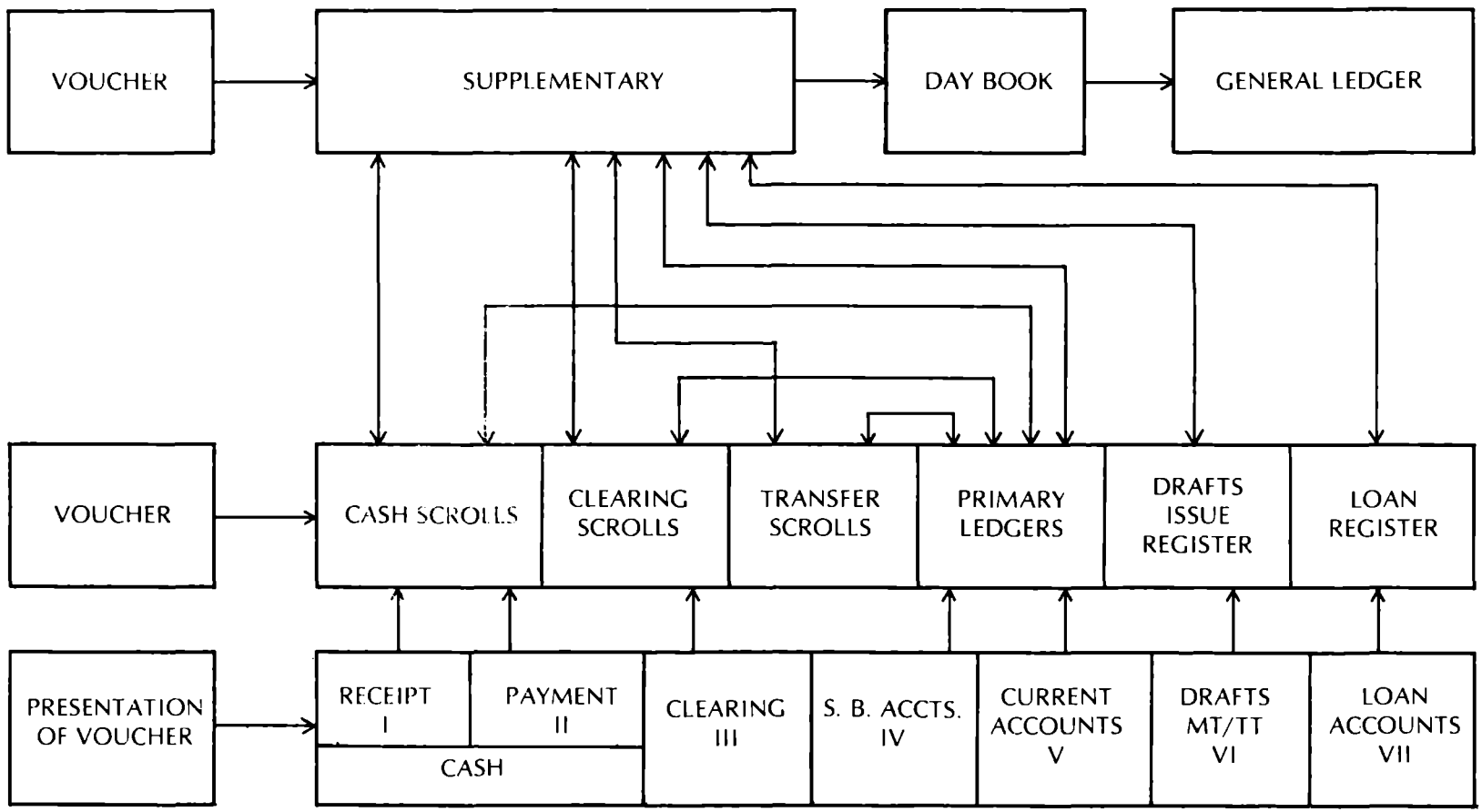
4.2 Even though there are wide variations in the terminologies used by banks to designate various transactions, the basic accounting systems and practices remain more or less the same for all banks. These are based on the principle of double entry, with every debit transaction having a counter part of a credit entry and vice versa. Each transaction is supported by a voucher which is the centre-piece of the Branch Accounting System. The use of a composite voucher to record consolidated transactions under the same head is also not uncommon.

4.3 Branch transactions are basically classified as cash, clearing and transfer. Transactions recorded under these heads have their images recorded in primary ledgers and other books of accounts. The Branch Accounting System is divided into three clear levels: entering transactions in three primary scrolls, i.e., cash, clearing and transfer; recording transactions in various primary ledgers; and writing the final day book, listing all debit and credit transactions of the day and grouping them under general ledger heads of accounts. The day book would be taken as balanced when the aggregate of debit entries tally with the aggregate of credit entries, and also with the aggregate of totals in cash, clearing and transfer scrolls. When the day book is balanced, the daily debits and credit totals under each head of account are posted in general ledger to arrive at uptodate balance under each head.

4.4 This process can best be illustrated by considering transactions on any one head of account, say current accounts at the branch. The general ledger at the branch will have various heads of accounts such as current account, savings account, time deposit account, cash credit account, bills purchased account, loan account, etc. The balance in general ledger under current accounts, for example, will show the aggregate current deposits held by the branch. As these deposits are

CHART I

BRANCH LEVEL SET-UP



held by numerous depositors at the branch, it is necessary to have a record of balances held by each of the depositors. These are recorded in current account ledger (which is one of the primary ledgers), of which there may be more than one at a branch depending on the number of customers. The aggregate of balances recorded in all the current account ledgers will have to tally with the balance under 'current accounts' in general ledger.

4.5 Transactions on current accounts can be classified as (i) receipt of cash for credit into the account, (ii) payment of cash/cheques across the counter, (iii) credit to the account arising out of collection of a local clearing cheque, (iv) payment of a cheque received through local clearing and (v) transfer from/to the account, to/from another account at the branch, or some other branch of the bank. The procedures under each of these categories are described below.

4.6 Cash is tendered for credit of account at the 'cash receipts' counter and the voucher is recorded by cashier in a cash receipt scroll, and the counterfoil is handed over to the customer duly stamped. The voucher is then passed on to the accounts department where a corresponding cash receipt scroll is kept as a measure of counter-check. After the voucher is entered in this scroll, it is passed on to ledger-keeper and the transaction is recorded in appropriate current account ledger under the customer's account. The ledger-keeper then writes on the top of the voucher ledger number and folio number and initials the voucher in token of having posted the voucher in the client's account. The voucher is then sent to the balancing section for the purposes of writing the day book.

4.7 The cash cheque to be paid across the cash counter is first presented to ledger-keeper who verifies the cheque particulars and balance in the account, posts the cheque in the ledger, writes ledger number and folio number on the top of the cheque, initials it in token of having posted the entry in the ledger and passes it to an official for authenticating payment. The official passes the cheque for payment, records it in a cash payment scroll maintained by him and sends it to the cash counter for payment. The cashier pays the cheque and records it in the cash payment scroll maintained by him. The cheque, thereafter, lands in the balancing section for writing the day book. It will be observed that, as in the case of cash receipts, this transaction is also recorded in cash scrolls and primary ledger, with the difference that the order of entries gets reversed. But where payments are made under the Teller System, the cheque is presented directly to the Teller who makes payment without recording the transaction in the primary ledger. The cheque is then sent to the ledger-keeper who posts it in the ledger and passes it on to the official for post-authentication. After post-authentication, the cheque is sent to the balancing section for writing the day book.

4.8 For crediting the proceeds of collection of a local clearing cheque, the credit voucher originates in the local clearing section and is first recorded in the outward clearing scroll, the correspondent debit being afforded to the clearing branch. The voucher is duly passed by an official after verifying the entry in clearing scroll and is then sent to ledger-keeper. The ledger-keeper records the credit in the concerned customer's account in current account ledger and thereafter the voucher is sent to the balancing section for writing the day book. For debiting the customer's account for payment of a cheque received through local clearing, the cheque is initially recorded in the inward clearing scroll and sent to ledger-keeper who posts the cheque in the ledger and sends it to an official for passing the cheque and onward transmission to the balancing section.

4.9 Transfer entries, i.e., all transactions other than cash and clearing are initially entered in a transfer scroll and the vouchers, after being duly passed by an official, are sent to ledger-keeper for being posted in the concerned account. Thereafter, the vouchers are sent to the balancing section.

4.10 It is thus seen that every transaction is entered in one of the three scrolls, i.e.,cash, clearing or transfer and also in the primary ledger. The scrolls are self-balancing in the sense that the total of debits will always match the total credit. In regard to cash scroll, the opening balance of cash plus cash receipts will have to balance with cash payments plus the closing balance. The aggregate of outward clearing will match with a corresponding debit to the clearing branch. Likewise the aggregate of cheques received in inward clearing will match with credit to the clearing branch. In the transfer scroll also, every debit transaction will have a matching credit entry.

4.11 In the balancing section, vouchers are grouped under various general ledger heads of account for the purpose of being entered in the day book. Some heads of account such as current account will have a larger volume of vouchers and it would indeed be cumbersome to list them out in one day book. Further, as these transactions have also to be verified with primary ledgers, this work has to be shared by a few officials at the branch. Hence, the concept of a 'supplementary' to the day book is in vogue in almost all branches. A separate supplementary is maintained, for example, for each current account ledger with debit and credit transactions listed separately. The aggregate totals of all current account supplementaries are transferred in a summary form to the day book. A similar practice is followed in respect of other heads of account where the number of transactions is large. Other vouchers are listed directly in the day book.

4.12 As mentioned earlier, the aggregate debits in the day book will have to balance with the credits and also with the total of cash, clearing and transfer scrolls. This will ensure that all the transactions at the branch have been duly accounted for. But this process does not ensure that all transactions are entered properly in the primary ledger. To ensure this, transactions recorded in supplementaries/day book are checked with entries in the primary ledger before commencement of business the next day.

4.13 After the day book is balanced, the aggregate debits and credits under each general ledger head of account are posted in the concerned account in the general ledger, and the general ledger balances are updated. The listing of general ledger balances known as "General Ledger Abstract" will give the trial balance of the branch on any day. At periodical intervals, balances in primary ledgers, particularly current, savings, cash credits/loan and time deposits accounts and also office accounts such as drafts payable, inward and outward bills, are listed in a balancing book and the totals are tallied with the concerned general ledger balances.

4.14 The following are some of the major problems currently faced by branches:

(i) In most of the major branches, day book balancing is not completed on the same day; in fact, it falls into arrears by several weeks. The number of vouchers to be listed in supplementary/day book is oftentimes more than 1,000-1,500 (in some cases even as large as 3,000-5,000) and several errors creep in and do not get detected while checking. There is also the problem of missing vouchers which can be traced only when each transaction recorded

in cash, clearing or transfer scrolls is crosschecked with supplementary/day book. This is a laborious task and, when balancing falls into arrears, the position worsens.

(ii) When the day book is not balanced, updating the general ledger is delayed and this affects the flow of information from the branch. The major casualty is Section 42(2) Return, the non-submission of which delays the compilation of final figures by several weeks.

(iii) The daily statement of inter-branch transactions is also delayed, resulting in accumulation of mis-matched entries. The potentiality for fraud in the late submission of these statements is amply borne out by recent experiences.

(iv) In several large branches, the primary ledgers of current and savings accounts are not tallied with the general ledger balances under respective heads. There is a considerable risk involved in this in that any superfluous entries in the ledgers unsupported by any transaction/vouchers remain undetected for a long time. Several frauds have been perpetuated by taking advantage of arrears in the balancing of ledgers.

(v) Apart from the current account and savings accounts ledgers which are customer accounts ledgers, several office account ledgers such as drafts payable are not balanced in some branches for months together and in some cases even for years. In some branches, this work has been entrusted to outside agencies, as banks find it impossible to trace these differences with their own manpower.

(vi) The extent of customer dissatisfaction is increasing in the large branches due mainly to the following:

(a) Statements of accounts are not submitted in time; they are not properly compiled and handwriting is becoming more and more illegible.

(b) Savings bank pass books are not being updated across the counter; they remain unattended at the branch for days.

(c) Standing instructions on behalf of customers are not given effect to properly and there are several cases where innocent customers have come to grief due to the faults of banks.

(d) Local and outstation clearing instruments are not promptly despatched for clearing, resulting in delays of upto 4/5 days for local clearing and 4/5 weeks for outstation clearing.

(e) In some branches where the Teller System is not in vogue, payment of cash cheques is also considerably delayed by as much as half an hour.

(vii) In advance accounts, revenue leakage through short collection of interest has become a regular phenomenon; this arises mostly from clerical errors in calculations which go undetected in checking. The amount of revenue loss to major banks is considerable and only a part thereof is generally detected by the revenue audit conducted annually by banks.

4.15 Equally serious are delays in compilation of data for management information system. For macro-level information, the delay in balancing of books and reformatting of data culled out from

different books of accounts has been a major factor in holding up submission of some of the statutory returns. As regards statistical information, most of the returns are based on schemewise reporting of performance of branches. In particular, returns on loans and advances require multiple classifications of account level outstanding balances. This is a very tedious and time consuming work and is generally given the lowest priority in the day to day working of the branch. The Goiporia Committee had suggested some changes in formats of branch level records to facilitate compilation of all types of returns.

4.16 Many of these problems are inherent in a manual system of operation and arise partly from indifferent attitudes but mostly due to expansion in the volume of transactions. Unless the work systems are modified, these deficiencies will continue to persist. Apart from the adverse impact on customer services, there is the danger posed to banks in the context of the increasing incidence of frauds. The need for switching over to a mechanised system aimed at removing these deficiencies to the extent possible is, therefore, imperative.

4.17 In branch level functioning, there are three distinct areas which require different types of machine support: cash transactions, cheque clearance (which requires physical sorting of documents in a short time) and posting of books of accounts. Besides, there are a number of other functions in branches which can be handled with simple machines. The types and number of machines needed in a branch would naturally depend primarily on the nature and volume of transactions in the branch.

4.18 We first consider the type of mechanisation needed for expeditious posting and balancing of books of accounts and improving customer services. This is the area which merits primary attention. Transactions on deposit/loan accounts and remittances involve a large number of multiple entries in different books of accounts. We feel that accounting machines with attached memory modules can effectively take over posting of entries in primary ledgers and preparation of day book and general ledger described earlier. During the deliberations of the Committee, two basic models for mechanisation at the branch level emerged. The first model envisages replacement of manual procedures of making entries in primary ledgers particularly those relating to customers accounts such as current and savings accounts, time deposits and cash credit and loan accounts with the help of an electronic ledger posting machine with attached memory module. These types of machines can be installed in adequate numbers in a given bank branch. The second model has a much larger capacity so that all the functions performed by different machines under model I, can be performed by a single machine. Besides the ledger postings and allied functions, model II machine will be able to generate the Management Information System. The ledger posting machine (model I), the functioning of which is described below, is an improved version of the electronic ledger posting machines already available in the market, while the model II machine is a microprocessor based system.

4.19 The electronic ledger posting machine with attached memory (model I) which we are recommending consists of a typewriter keyboard, a video screen, two floppy disc drives and a printer. One of the floppy discs will store certain basic information on approximately 1,500-2,000 accounts. For each account, information on account number, name(s) of account holder, standing instructions regarding operation of account, cheque form numbers issued, other instructions if any, and last cleared and uncleared balances will be stored.

4.20 Whenever any transaction is to be processed, the ledger-keeper takes the voucher and keys in the account number. The information stored on the account will then be recalled and displayed on the video screen. This is the information which the ledger-keeper verifies in the present manual system to pass the current transaction. When he is satisfied that the current transaction can be passed through, he will key in the instrument number and the amount. On pressing the "Execute" key, the particulars will be recorded on the second floppy disc with nececessary identification particulars. This step is similar to posting of the entry in primary ledger. Thereafter, the present procedure of verification of signature, making entry in cash scroll, etc. will be followed.

4.21 The machine automatically carries out the following functions: (i) casting the balance in the account, (ii) working out daily products in the case of cash credit accounts and monthly products in the case of savings account, and (iii) calculating the interest due to be received or paid. It will be observed that, once it is ensured that the transactions are correctly keyed-in, complete arithmetical accuracy in processing would follow, removing one of the major bottlenecks in the balancing of primary ledgers at the branches. The machine would also carry out certain ancillary functions: (a) it will print out a strip giving details of the transaction as and when it is entered into, to be initialled by the ledger-keeper and the concerned official (wherever needed), in token of transaction having been put through; (b) it will print out at the end of the day a list of the day's transactions to be verified with the vouchers; (c) it will print out statements of accounts of customers at periodical intervals; (d) it will list out daily standing instructions to be executed in the accounts; (e) it will also print out advices to customers if and when required; (f) it will caution the ledger-keeper in respect of accounts (such as new accounts) where care has to be exercised in entering transactions as a measure of prevention of fraud; and (g) it will refuse to accept entries in regard to cheques stopped for payment.

4.22 The machine can incorporate within itself certain basic safeguards to prevent manipulation. The machine will be put into operation at the beginning of the day by an official using a secret password. The ledger-keeper will also have his personal password and will use this to activate the machine and record the transactions. The personal password will be changed with every change of ledger-keeper and this change can be effected only by an authorised official.

4.23 The ledger posting machine described above catches information as the current transaction is being processed. It performs two main functions, viz., posting of entry in primary ledger and writing of other books of accounts. To ensure that every transaction has been entered in the machine, listing in the form of supplementary will be checked entry by entry with the day's vouchers. With a single point entry of a voucher, the machine simultaneously updates the primary ledger and prepares the supplementary. This would greatly facilitate balancing of books. After the day's transactions are over, the basic floppy will be updated to continue with the next day's transactions. Statement of accounts will be generated in the form of primary ledger and, if necessary, a printout can be given to customer to serve as a passbook.

4.24 For different counters which serve different purposes, stand alone functional machines can be developed to perform dedicated functions. Thus, we could have one machine to process savings/current account transactions. One of the machines can be designed to generate the day book and general ledger. For non-mechanised counters, the vouchers will be sorted account

headwise and entered in the machine before the day book is generated. The advantages of preparing the day book and maintaining the general ledger on the machine are many. For example, when the day book is prepared through the machine, the daily statement of inter branch transactions can be generated as a print out, thereby avoiding delays in the submission of statements. As the general ledger is the basis for most of the information systems, it will be possible to dovetail the information systems with the accounting system so as to improve flow of information from the branches.

4.25 The number of machines that will be required would depend upon the number of accounts and the volume of transactions in a branch. A machine can generally have a capacity to store data in respect of about 2,000 accounts and carry out about 6,000-8,000 transactions. On completion of 8,000 transactions, the ledger pages (floppy contents) may have to be extracted and stored separately and fresh set of transactions commenced. A machine may be required to process on an average about 300 transactions per day and, on this basis, the number of machines for a branch may have to be worked out. On an average, each branch may need about 3 - 4 machines.

4.26 The above model of mechanisation consists of a group of stand alone dedicated functional machines. The hardware of different machines is identical and the functional capability of the machine is derived from the software floppy disc to be supplied by the manufacturer. The machine can be initialised in the morning (before the banking hours) for a particular function by inserting the appropriate floppy. In case the machine at a particular counter malfunctions, another machine could be initialised for the particular function. The process of initialisation would take hardly two minutes and, wherever necessary, banks may acquire spare machines for important branches. The Committee was informed that these machines have already been installed at a limited number of branches in two or three major banks for pilot run.

4.27 In the large branches, it may be convenient and advantageous to introduce a different model of mechanisation, particularly taking into account the fact that floppy discs have a limited storage capacity and a built-in delay in retrieval of information. In the first model, there will be a group of stand alone dedicated functional machines performing modularly different functions. These machines would replace the existing manual system of maintaining primary ledgers. The second model, however, envisages continuance of the present manual processing of transactions right upto the primary ledger stage. In this model, a single sophisticated machine would be installed at the back office to capture the transactions after they have been posted in primary ledgers. This machine will store particulars of all customers' accounts and general ledger accounts. When the daily transactions are fed through one or more terminals, the balances will be updated simultaneously. Day books are written through the machine and supplementaries generated. Calculation of interest, execution of standing instructions, compilation of statements on customers' accounts would all be carried out through this machine in the same manner as envisaged in the first model. This machine would also be used to obtain print outs of the various returns and statements required by the branch information system.

4.28 The second model has undoubtedly certain distinctive merits over the first. It seeks to capture the entire gamut of transactions taking place at the branch through the machine and this would greatly facilitate the information system at the branch. The switch over from the manual to

the machine system will be gradual and smoother, as the processing of transactions upto the stage of recording in primary ledger will continue to be manual as heretofore. Cost-wise also, the system will work out cheaper in the long run.

4.29 Both the models would, however, adequately meet the requirements of the situation. While the choice of the model to be installed at any branch/bank would depend on the circumstances obtaining in it, we feel that model II will be best suited for big branches.

4.30 There are multiple benefits in either of the above type of mechanisation in branches. There will be considerable improvement in customer services. Customers will get neat and accurate print outs of transactions on their account; all the standing and ad hoc instructions will faithfully be executed and the periodical interest calculations will be accurate. As regards house-keeping operations, once the vouchers are tallied with the machine listing of transactions in the form of supplementaries, the day book and general ledger will be posted and balancing of books will not pose any problem. The safety procedural checks to protect the customer and the bank will automatically be carried out by the machine once it is designed for the purpose.

4.31 The introduction of machines would no doubt call for changes in work system at the branches. For example, it will be useful if the branches which introduce these machines switch over to a Teller System for making cash payments. The Teller System may have to be made more comprehensive by extending it to all cash transactions less than Rs. 2,000-2,500 on all accounts, viz., current, savings and cash credit accounts. For payments of more than Rs. 2,000-2,500, a reference to the ledger to ascertain the balance held in the account will be necessary; as such cash transactions are fewer in number, reference to ledger will be minimal.

4.32 While some changes in the work systems will thus be necessitated by the introduction of machines, care will have to be taken to see that the existing checks and counterchecks evolved over a period of time are not discontinued. In fact, certain additional security measures are necessary for preparing records of transactions and ensuring that the records are not corrupted, intentionally or otherwise. Such safeguards can be built into the models recommended by us. However, this calls for some detailed work. We have later in our Report suggested that the Indian Banks' Association (IBA) should play a vital role in the smooth implementation of the programme of mechanisation. The working out of comprehensive checks and safeguards would have to be given top priority by the IBA and should be a condition preceding the introduction of machines.

4.33 In addition to these machines, it may be useful to introduce some simple machines in branches where cash receipts and cash payments and number of cheques lodged for clearing are heavy. The machine required for handling cheque clearance has been described in Chapter VI. For cash receipts and payments, a modified version of cash registers can be introduced. Cash registers have become common in many establishments which have heavy cash receipts. This machine accepts, through a typewriter keyboard, itemwise account figures, generates a listing and totals them with a printout on command. The totals are stored so that at the end of the day a grand total of cash receipts is readily available. In another version which is suitable for endorsing bills, the voucher is inserted in the machine and appropriate data are keyed in. On command, machine prints out the particulars on both portions of the voucher — the original and the counterfoil — and

the cashier has merely to tear off the counterfoil to be given to the customer. A similar type of machine with suitable modification can be developed for cash counters in branches.

4.34 It is difficult to envisage at this stage the precise implications of the reduction in the workload after the introduction of machines at the branches. This can be worked out only on the basis of actual experience in the implementation of the new system. The Committee, however, feels on the basis of the data placed before it that, the reduction in the workload will not be more than ten percent. The introduction of machines is, however, expected to improve the customer service to such a significant extent as to increase the number of clients at the branch in much greater proportions. The increasing volume of transactions generated by this will ensure that the overall employment potential of banks is not affected.

4.35 In Chapter IX, we have given the estimates of the number of machines required over the next five years and the consequential costs. Other concomitant requirements such as training of personnel and standardisation, etc. are also discussed in that Chapter. We are aware that the banks may have to face a few procedural and other infrastructural problems in implementing either of the models. We, therefore, recommend that banks may select a few branches and implement either of the models on a pilot basis. During this period, parallel runs as per the existing manual procedures and new machine procedures may be undertaken.

CHAPTER V

INFORMATION SYSTEM ON LOANS AND ADVANCES

5.1 As stated earlier, the base of banking business was shifted in the late Sixties, from "Credit to a small section of well organised borrowers" to "Credit to borrowers as per the development priorities and needs". Under the policies of credit extension pursued in the Seventies, the number of borrowal accounts increased five fold. In fact, bank branches were opened in unbanked centres specifically to meet the needs of small borrowers. The banking system today has more than twenty million borrowal accounts, of which 94 per cent had individually credit limits of less than Rs. 10,000. Specific targets have been laid down for disbursements of credit under specified schemes and many statistical returns require schemewise reporting of state or district level performance. Against this background, information system on loans and advances has become very crucial.

5.2 At present, information on loans and advances by banks is organised under the following sets of periodic returns :

(a) Section 42(2) Return, Form X Return and similar other returns which give loans and advances under assets of the bank as a whole.

(b) Accountwise information on accounts above a cut-off point in terms of credit limits sanctioned; these include partywise/accountwise data in the form of BSR and returns under Credit Information System and Credit Authorisation Scheme.

(c) Branchwise/schemewise/districtwise information in returns prescribed under the Lead Bank scheme, Twenty Point Programme and Priority Sector Advances.

At the micro-level, the objective of the information system is to monitor the security of individual loans/advances. At the macro-level, the system throws up information on sectoral flow of credit for formulation of credit policies.

5.3 Information system under (a) above is used to monitor bankwise performance and to work out various statutory ratios, calculation of interest, penalties etc. The main input to the system is provided by branch level outstanding balances under specified heads/subheads of accounts in the general ledger. In large branches, which we have proposed for mechanisation, the balancing of books would become more or less automatic and with standardisation in the format of the general ledger, branch level data on loans and advances with desired accounting headwise break-up, can quickly be compiled and transmitted. For small and medium sized branches which may not be mechanised, compilation of the required information is not expected to be delayed.

5.4 Information systems under (b) and (c) are used for monitoring schemewise performance against respective targets, preparing credit budgets/plans and for analytical purposes The main input to these systems is provided by accountwise outstanding balances classified in the desired manner. In some banks, schemewise ledgers are being maintained which facilitate reporting of schemewise outstanding loans and advances. Where the compilation of a return requires scanning

of account level information, two types of processing are involved, viz., coding of various characteristics of an account and repeated sorting and summarisation of information. Each loan/advance account has 12 to 15 classificatory characteristics such as type of organisation, sector status, scheme under which loan is granted, type of credit and security. Each of these characteristics has further sub-classifications ranging from 5 to 50, for different items. This information is recorded on the primary ledger folio and may require one time coding. The basic classificatory information does not normally change during the currency of the account. Depending on the periodicity and format of the return, information on accountwise balances is required to be sorted again and again and then summarised. This is a very tedious job.

5.5 Since branch level data on loans/advances coming under the information system at (a) above are also built up from the account level transaction data, it should be possible to design an integrated information system which will have a flexibility to generate quickly outputs in different formats. The system can be designed in the form of a master office file built from one time information on each borrowal account and a transaction file built from monthly/quarterly data on transactions and/or outstanding balances on each account. The master office file can periodically be updated for new accounts opened, old accounts closed or modifications in classificatory items. Both these files can be linked to generate desired statistical returns. Once the core system is stabilised, its scope can be expanded to cover information on loan applications received, sanctioned, rejected, disbursements, recoveries, etc.

5.6 The two main classifications under the portfolio of loans and advances are type of borrower and type of credit. The first classification categorises the borrower as belonging to (i) agriculture, (ii) small-scale industries, (iii) weaker sections and priority sectors and (iv) institutional status of the borrowers, etc. The type of credit is classified as (i) cash credit, (ii)overdraft, (iii) agricultural cash credit, (iv) agricultural term loans, (v) other term loans, (vi) demand loans, (vii) inland and foreign bills discounting limits, (viii) letters of credit and guarantees issued, etc. All these items would need uniform code designs. In specified sections of the information system, the input to the transaction file will be in the form of account level information, while in some other sections the input may be in the form of aggregate branch level positions. The output of the system could be in the form of performance report on the branch or Basic Statistical Returns or Lead Bank Returns, Priority Sector and Twenty Point Programme returns, returns under Credit Information System and Credit Authorisation Scheme, etc.

5.7 The above information system can be built by preparing and maintaining "control card" for each account. This control card will be filled in at the time of opening of an account. For the accounts already opened, this one time job will have to be completed on a crash basis in the shortest possible time. The broad functional classification of loans such as agricultural loans, priority sector advances and small-scale industries advances could be indicated by the colour of the card. For example, control cards for agricultural loans could be green in colour, while those for small-scale industry advances could be in white colour. The control card will have all the basic and classificatory information on the account, which is recorded at present on the primary ledger folio of the account as also on the application form for opening on account. As this basic information does not change during the life time of an account, preparation of control card is a one time job.

5.8 Information on classificatory items recorded on the control card could be in the form of encircling or ticking off the appropriate classificatory codes which will be preprinted on the cards. It could also be in the form of crossing out "Yes/No" type of description. It is observed that some of these classifications required for different returns are overlapping and considerable confusion exists at the branch level in classifying the accounts for compiling statistical returns. We, therefore, recommend that these classifications/nomenclatures may be standardised and made uniform for all the returns. Further, frequent changes in the formats and classificatory items need to be avoided, as any changes in the classificatory items would necessitate preparation of all the control cards again.

5.9 These control cards form the input to the master office file described above. The transaction file is to be built up with desired level of periodicity. It is observed that the outstanding balances against each account number are recorded on the jotting sheets which are prepared in branches on a monthly basis. These jotting sheets will provide the input to the transactions file. The linking up of the master office file with the transactions file will be done on the microprocessor systems in the zonal offices of banks which we have recommended. Branches within a zone can supply carbon copies of the control cards and monthly jotting sheets to the zonal microprocessor unit. This information will be entered into the microprocessor system and branchwise master office file and transaction file will be generated. Once the two files are built up, any statistical return can be generated on the microprocessor system by extracting, linking, sorting and summarising the information from the two files. Copies of the printouts can then be sent to branches as feedbacks and onward to head office for generating bank level information. Master office file may be updated once in six months or so and transaction file every month. The system would also generate periodically branch level primary/general ledger balances which can subsequently be reconciled with the branch ledgers.

5.10 Till the zonal level microprocessor systems are established, it may be feasible in small banks to handle all the control cards and monthly transactions data (jotting sheets) for all branches on the computer system in their head offices. Where this is not feasible, the branches will have to continue compilation of statistical returns as at present. However, the burden of compilation would considerably be lightened with the help of jotting sheets and control cards. For any classification required, whether on a single item or multiple items, the cards can be hand sorted, as postal cards are sorted on pincodes. After sorting, the outstanding amounts against respective account numbers can straightaway be picked up from the jotting sheets and totalled on pocket calculators. This way the intermediate work sheets can be eliminated and sorting can be completed in a short time.

5.11 A further improvement in the information system can be made with suitable integration of different statistical returns. (e.g. health code can be included in BSRI-A). In due course, the above information system can be extended to cover disbursements and recoveries. This, however, would require accountwise credit/debit balances. At the zonal level, the system will use the previous quarter's data or such approximations in case of non-response from a few branches.

5.12 The system would require uniform code designs to identify a branch and its geographical location, borrower code number, account number, type of loan and advance facility codes used in

the BSR system, etc. The Reserve Bank of India has already designed uniform code numbers for branches. Other coding systems need to be standardised and we have recommended in Chapter VIII that the Reserve Bank should review the existing coding system with a view to standardising them.

5.13 As pointed out earlier in Chapter II, the main bottleneck in data flow channels in the banking industry is at the branch level. The information system on loans and advances has two peculiar problems. In the case of credit extension schemes designed for weaker and priority sectors of the society, the accounts are spread over a large number of rural and semi-urban branches and the information system has to receive inputs from a very wide geographical spread. In the case of big branches which account for a very sizeable proportion of total advances, the inputs to the system are delayed for a variety of reasons. We hope that, by following the procedures outlined above, the data flows from branches will run smoothly.

5.14 Banks are now required to maintain profiles of loans/advances and keep a watch over the follow-up of their recoveries. For big loans, the working results of borrowers and observance of various norms prescribed by the Tandon Committee have to be reviewed from time to time. In due course, the credit information system described above will have to be extended to these new areas.

5.15 The design of the control card will have to be finalised by considering the classificatory requirements of all the returns on loans and advances and the banks may be instructed to complete the work of preparing control cards for all the credit accounts. If this step is undertaken before the establishment of the zonal level microprocessor systems and head office computer systems, the Information System on loans and advances can quickly be built up on the microprocessor/computer systems. We, therefore, recommend that the Information System on loans and advances may be designed on the above lines and the banks should take necessary advance action. On an illustrative basis, a specimen of the control card for agricultural loan accounts is given at the end of the Chapter.

ILLUSTRATIVE CONTROL CARD FOR AGRICULTURAL ADVANCES

Branch Code	Name and Address of Borrower	Account Number	Borrower No.	Comm. Dev. Block No. of Borrower

Facility	Credit Limit	Organisation Type	Place of Credit Utilisation	Land Holding
Type Code			District State	Owned On lease

Date of opening of A/c	Type of Loan	Interest Rate %
	Demand Shortterm Longterm	Frequency

Individuals

SC/ST etc.

SC
ST
BC
Others

Socio-Economic Class

Landless Labourer
Tenant Lessee
Land Owner
Share cropper
Small farmer
Others

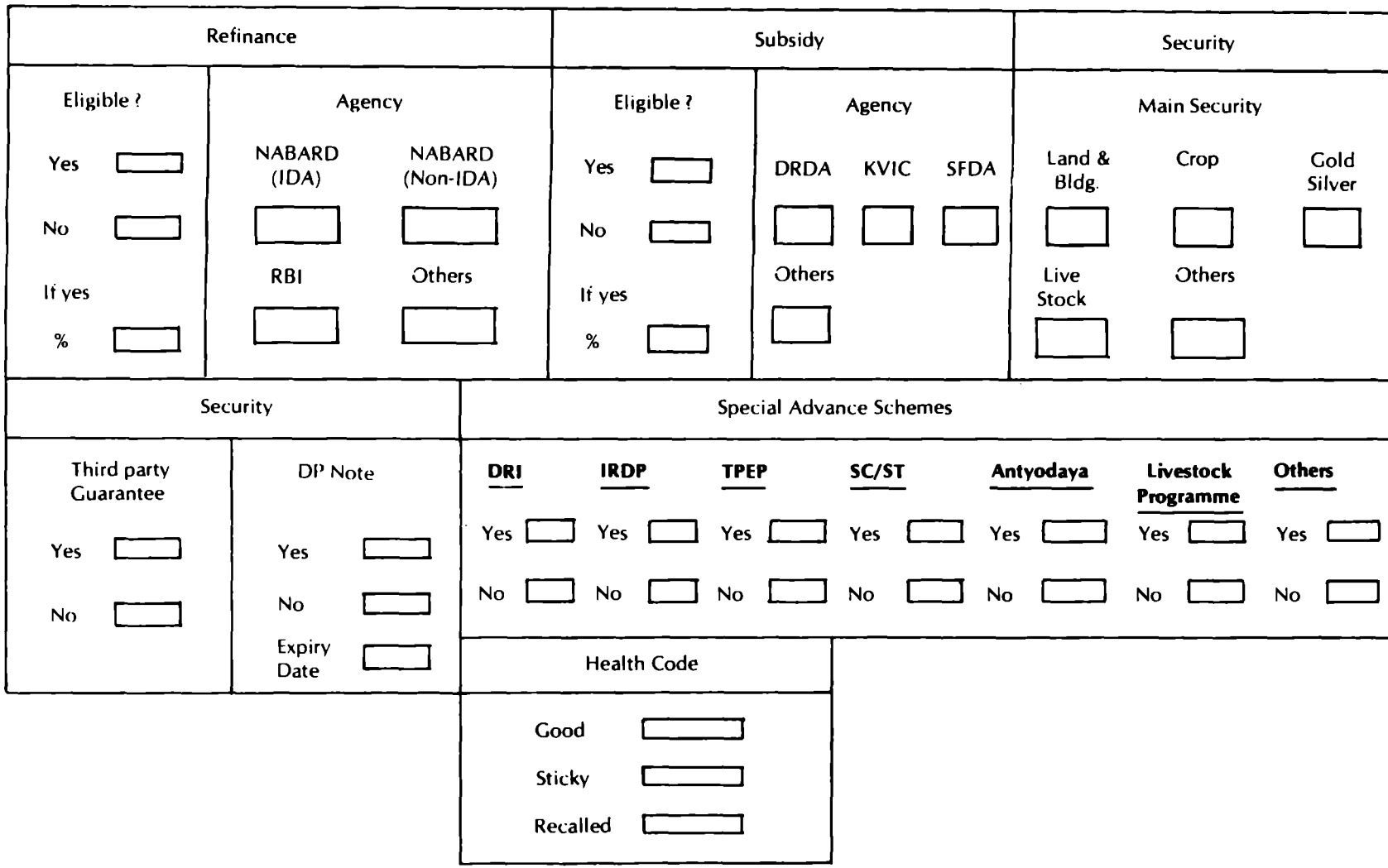
Physically Handicapped

Special categories

Ex-defence personnel
Victim of calamity
Others

Non-Individuals

Corpn. for SC/ST/BC
Corpn. for Welfare of Weaker Section
Co-operative Organisation
Institute for Physically Handicapped
Others


Refinance
Eligible ?
Yes
No
If yes
%
Agency
NABARD (IDA)
NABARD (Non-IDA)
RBI
Others
Subsidy
Eligible ?
Yes
No
If yes
%
Agency
DRDA
KVIC
SFDA
Others
Security
Main Security
Land & Bldg.
Crop
Gold Silver
Live Stock
Others
Security
Third party Guarantee
Yes
No
DP Note
Yes
No
Expiry Date
Special Advance Schemes
DRI
IRDP
TPEP
SC/ST
Antyodaya
Livestock Programme
Others
Yes
No
Health Code
Good
Sticky
Recalled

CHAPTER VI

INTER-BANK CHEQUE CLEARING OPERATIONS

6.1 The main traditional function of the banking industry as a financial intermediary is implemented largely through clearing of cheques and such other instruments drawn on other banks. Considering the rising costs associated with holding/borrowing of funds, the efficiency of cheques clearing system may have a significant impact on the tempo of economic activities. In the context of rapid and large scale expansion of banking industry during the last decade and half, clearing of cheques has become one of the most critical and sensitive areas in banking services where reduction in clearance time will contribute towards better customer services and minimisation of float. Transactions through cheques is one step towards minimising risks and costs in the transfer of money (currency), and its logical prefection is to be found in Electronic Funds Transfer.

6.2 The present problem of the clearing system is closely related to the growth in the volume of cheques passing through clearing houses. In 1951, there were 29 clearing houses in the country. Within the last three decades, the number has increased to 595. During the same period, the volume of cheques cleared per annum has gone up from 26 millions (worth Rs. 6,600 crores) to 220 millions (worth Rs. 1,86,000 crores). About 55 per cent of the cheques cleared are handled in the clearing houses in the four metropolitan cities of Bombay, New Delhi, Madras and Calcutta. The entire work of clearing, from sorting of instruments within a branch for outward clearing to their receipt in the branch through the clearing house and subsequent posting of proceeds to customers' accounts, is at present wholly handled under manual systems with considerable strain and tension. The clearing of local cheques usually takes three to five days and for outstation cheques, the delay ranges from three to six weeks. All the instruments received for clearing have to be physically handled/transported from one place to another in the shortest possible time and the sheer volume of the number of instruments involved makes it difficult to ensure physical verification at each stage of transfer from one hand to another. The speed and volume of entire operation could give some scope for fraudulent transactions. The Working Group on Customer Services in Banks referred to in para 2.19 of Chapter II had recommended the setting up of a National Clearing Authority to tackle the problem of clearing outstation cheques and to manage clearing houses. The Working Group had also recommended creation of regional grids around the four metropolitan cities and separation of processing of intra-grid out-station cheques and inter-grid out-station cheques. The Working Group had felt that clearing operations were ideally suited for mechanisation/ computerisation.

6.3 The present manual system of clearing of cheques is illustrated in Flow Charts — I and II given at the end of this Chapter. A cheque deposited by a customer for credit to his account in a branch of a given bank might have been drawn upon (a) the same branch, (b) another local branch of the same bank, (c) outstation branch of the same bank, (d) local branch of another bank and (e) outstation branch of another bank in India. The cheques drawn on branches/banks in foreign countries need not be considered here. Clearing of cheques of type (a) above are processed

internally in the branch through book adjustments, while cheques of types (b) and (c) are cleared internally by banks through the "inter-branch" account. For handling cheques of type (c), there may be a branch — branch communication or clearance may be handled by regional collection centres or service branches of the bank, resulting in a number of entries in books of accounts and inter-branch adjustments. Cheques of type (d) are cleared through local clearing houses and the procedure adopted has been described subsequently. The procedure of clearing (e) type of cheques may vary from bank to bank. The most common procedure adopted by banks is to send the cheque to their own main branch in the centre where the drawee bank branch is located and present it through that centre's local clearing and on clearing adjust the proceeds through "inter-branch" account. The postal delays in transmission and communications thus add further delay to the time taken for local clearing.

6.4 The procedure adopted in local clearing may be described in some detail here to identify the type of mechanisation needed to speed up clearing operations. In the outward clearing section of a bank branch, local cheques deposited by account holders are scrolled and sorted bank-wise, listed and bundled. The wrapper on the bundle (called the "patti") shows the bankwise number of instruments and their respective total amounts. Such bundles from all branches of a bank within the centre are then collected together in the local main clearing branch of the bank. Bundles received from all the branches are verified and pooled together bankwise and balanced, and one packet per drawee bank is prepared and delivered to the clearing house. These represent the claims of the presenting bank on other banks participating in the clearing. When every bank's claims against other banks are presented, settlement is reached by balancing net amounts of claims to be paid against net claims to be received.

6.5 After the clearing is settled, the packets received by a bank from other banks, which represent the claims to be paid, are brought to the local main clearing branch and, from here onwards, the process of inward clearing starts. In the local main clearing office, the bundles are unpacked, verified and sorted branchwise and balanced and then rebundled with necessary "patties" and delivered to the branches. The packet received in a branch is verified and then released for posting of debits to respective accounts. In the entire process, several accounting entries are required to be passed and recorded in the books of accounts.

6.6 The entire process of clearing of cheques thus involves three distinct stages. In the first stage, each bank branch has to receive cheques, enter them in a clearing scroll, sort and list them, prepare packets and deliver them to the local main clearing branch, where the process is repeated in bankwise pooling of packets received from all the branches. In the second stage, packets of instruments are exchanged between banks in the clearing house and a settlement is reached. In the third stage, packets received from the clearing house are verified, sorted and balanced and dispatched to respective branches. In all these three stages, the processing involves (a) sorting of instruments, their listing and taking totals (b) verification and posting in books of accounts and (c) working out net positions of claims delivered and claims received and arrive at a settlement in the clearing house. The processing at (c) in stage two involves creation of a bank x bank matrix, the rows of which indicate the instruments received by a bank and the amounts to be paid and the columns indicating the instruments delivered by a bank and the amounts to be received by it. Though the second stage is crucial, the time allocation of manpower utilised would show that the

work in branches and the local main clearing branch would account for more than 90 per cent of manpower utilisation.

6.7 The specified time discipline for the entire process is very rigorous, and any possible negligence of the staff resulting in inaccuracies, mis-sorting of cheques and errors in posting, and non-cooperation even by one bank throws the entire process of clearing out of gear. The total time span of processing one cycle of cheque clearance is directly proportional to the volume of cheques submitted for clearance and the number of banks/branches involved. The repetitive time bound manual procedures of sorting, listing and totalling have thus come under a severe strain because of the increasingly large volume of cheques passing through clearing houses.

6.8 The National Industrial Tribunal Award of 1981, referred to in para 2.21 of Chapter II, had given its approval for computerisation of clearing houses. In the subsequent two years, the Reserve Bank of India installed mini-computer systems at the clearing houses in Bombay, Delhi and Madras. The installation of these computerised settlement systems, has enabled the member banks to deliver cheques for collection twice a day, with a sufficient gap for return of unpaid cheques. The system accepts the delivery statements given by members as the basic input and settlement is speedily accomplished. The manual errors of posting and balancing of entries and related delays at the clearing house have been eliminated and the time bound cycle of clearing has facilitated faster cheque clearance. The Reserve Bank proposes to extend computerisation in the clearing houses at Calcutta, Ahmedabad, Bangalore, Hyderabad and Kanpur shortly.

6.9 The computerised systems described above take care of work in stage two described earlier. For the branch level processing, the work is essentially of physical sorting of instruments. To examine the modalities of mechanising these operations, the Reserve Bank of India had constituted a Working Group in 1983. The Working Group recommended that the "item-processing" procedure as followed in many Western countries should be introduced in India with suitable modifications. After considering two alternative technologies for this purpose, viz., Magnetic Ink Character Recognition (MICR) and Optical Character Recognition (OCR), the Group recommended the adoption of the MICR technology. The process involves encoding in magnetic ink, specified details on the cheque itself to facilitate mechanical sorting, with simultaneous generation of necessary listings. The system would require standard quality/size of cheque forms with space for encoding information at the bottom. The cheque serial number with city/bank/branch code and possibly the transaction code are to be preprinted with special ink. The account number is to be encoded with special ink at the time of issue of cheque books to customers, while the amount is to be encoded when the cheque is received for collection. Banks will have to instal encoders in their branches depending upon the volume of transactions. Besides, common service centres of reader/sorters and encoders could also be established in case some banks do not find it economical to purchase these equipments. The Reserve Bank proposes to introduce national clearing of cheques with MICR technology between the four metropolitan cities viz., Bombay, Delhi, Calcutta and Madras early in 1985.

6.10 We, therefore, recommend that the banks may initiate advance action to assess their requirements of encoders and reader/sorters, adoption of standardised cheque forms and reorganising work procedures, and formatting of the relative books of accounts. The mechanised

cheque processing system will bring about fundamental changes in operating procedures and the banks will have to disseminate necessary information and train the staff down to the branch level. The Working Group constituted by the Reserve Bank referred to above has made detailed recommendations for adoption of the MICR technology for cheque clearance and feel that advance action needed for this purpose should be taken immediately. It needs to be emphasised that, if the full advantages of computerisation in clearing houses are to be realised, it will be necessary for the banks to take complementary actions in adopting MICR technology. (For details, see the Report of the Working Group to consider the feasibility of introducing MICR/OCR technology for cheque processing, Reserve Bank of India).

6.11 Participation in the clearing house on behalf of a bank is entrusted to the local main branch of the bank in a centre. Usually, the local main branch will have heavy transactions of its own and the activity of coordination of clearing work for all the branches puts additional burden on the local main branch. We, therefore, recommend that banks should establish service branches in centres where they have more than 10 branches and these service branches should be entrusted with the responsibility of clearing work on behalf of a bank.

FLOW CHART NO. I

INTER-BANK CLEARING OF LOCAL CHEQUES

Stage I

At bank branches

1. Cheque deposited by an account holder in bank branch.
↓
2. Sorting of all the cheques and their listing and preparing bankwise packets and consolidation of amounts.
↓
3. Transfer of packets with delivery statement to local main clearing branch.
↓
4. Branchwise deliveries verified and balanced and bankwise packets and delivery statement prepared.
↓
5. Transfer to Clearing House.

Stage II

At the Clearing House

6. Exchange of instruments and delivery schedules between member banks.
↓
7. Generation of listing of bankwise deliveries and amounts to be received.
↓
8. Working out bank x bank position of payables and receivables.
↓
9. Working out bankwise net payables/receivables and settlement.

Stage III

At bank branches

10. Receipt of instruments delivered by banks at the Clearing House.
↓
11. Verification, branchwise sorting, consolidation and balancing.
↓
12. Transfer of instruments to respective branches.
↓
13. Verification of instruments received and passing the entries.
↓
14. Recording of entries in books of accounts.
↓
15. Return of unpayable cheques through step (1) in Stage I.

FLOW CHART NO. II

INTER-BANK CLEARING OF OUTSTATION CHEQUES

1. Cheques deposited by customers.
↓
2. Bankwise and centrewise sorting and their despatch to the regional collection centres or local main clearing branches in respective centres.
↓
3. Adjust the transaction through credit/debit on "Interbranch' account.
↓
4. Presentation of cheque at the local clearing house as per Flow-Chart I.
↓
5. Advise originating branch on realisation/non-realisation of cheque and adjust the entry through credit on "Inter-branch" account.
↓
6. Credit the proceeds to customers' accounts or return the non-realised cheque to the customer.

CHAPTER VII

FOREIGN EXCHANGE BUSINESS OF BANKS

7.1 International banking business in India has shown a multi-dimensional growth over the last two decades. Besides managing the finance of merchandise export and import, banks are now servicing a large number of inward/outward remittances and non-resident accounts, foreign currency loans, issue of guarantees, foreign investments, besides handling retail sales/purchases of traveller's cheques, currency notes, coins, etc. Banks are also undertaking developmental activities in these areas. Foreign exchange (FX) transactions, as reflected in terms of credits *plus* debits in India's balance of payments accounts, have increased from about Rs. 2,100 crores in the early Sixties to Rs. 29,500 crores in the early Eighties. As a percentage of GNP, the volume of foreign transactions increased from 13.8 per cent to 20 per cent during the same period. At present, the number of merchandise and non-merchandise export and import transactions is of the order of 24 lakhs per year, handled by 12,000 branches of authorised dealers. The book-keeping procedures and the conduct of FX business are entirely different from the domestic banking business and call for different types of skills and controls, and warrant a separate computerised system. This Chapter deals with the present problems in generating FX information system under the manual procedures and suggests suitable mechanisation of foreign exchange operations of banks.

7.2 Bank branches (ADs) engaged in foreign exchange (FX) transactions are classified into three categories. The 'A' category of branches numbering about 160 have been allowed to open and maintain independent currency-wise accounts (called 'Nostro' accounts) with foreign banks/ correspondents. About 2,800 branches falling in 'B' category have powers to operate directly upon the Nostro accounts of 'A' category branches, under advice to their link 'A' category branch. A few foreign banks/exchange houses have also opened their accounts with Indian banks (called 'Vostro' accounts). All the remaining branches categorised as 'C' class handle their business through 'A' or 'B' category branch. Foreign exchange operations of all these branches are 'covered' by a few position maintaining offices, (usually 2 to 5) of each bank, which deal in spot or forward sales/purchases of foreign currencies with correspondent banks/branches abroad, the Reserve Bank and other banks in India.

7.3 Foreign exchange business of banks is largely governed in terms of the provisions of Imports and Exports (Control) Act, 1947 and Foreign Exchange Regulation Act (FERA), 1973. Besides, the Foreign Exchange Dealers' Association of India (FEDAI) has framed with the approval of the Reserve Bank, rules for the day to day conduct of foreign exchange transactions. During the last decade, a number of schemes have been introduced by Government and the Reserve Bank to boost foreign trade and to attract inward remittances. These schemes relate to credit guarantee and extension, subsidies, cover transactions, duty drawbacks, compensatory cash assistance, etc. Foreign currency loans for private and public sector organisations are now serviced by banks.

Besides, they provide international market information to their customers. While there has been a considerable delegation of powers to ADs and liberalisation in sanction of foreign exchange under various schemes, the operations of ADs are extensively regulated by the Reserve Bank. Banks are also required to back up foreign trade business by their guarantees to foreign parties. These guarantees may be financial guarantees, performance (of the exporter) guarantees or a combination of both or bid bonds guarantees. At the branch level, maintenance of different types of non-resident accounts has become one of the important activities.

7.4 The most common instruments through which foreign exchange transactions take place are Bills of Exchange, Telegraphic Transfers, Mail Transfers and Demand Drafts. Foreign exchange dealings of banks involve greater risk than domestic credit extension. In the first place, the authorised dealer has to evaluate the credit rating of the two parties involved in the transaction and thoroughly scrutinise the documents. Secondly, he has to ensure that the transaction is admissible under the RBI rules and all the specified procedures for book-keeping and accounts are properly followed. Lastly, the foreign currency money market has become very volatile and the unforeseen fluctuations in exchange rates may involve serious losses to banks on their uncovered positions.

7.5 At the branch level, each type of foreign exchange transaction is governed by elaborate procedures implemented through a number of stages. Processing of transactions under merchandise trade, which is the main function of AD branches, commences from the scrutiny of shipping and other related documents and assessing the customer's standing and his ability to meet the obligations of export/import contract. After ensuring the admissibility of transactions under the prescribed rules, the branch official has to prepare necessary vouchers/documents, make entries in appropriate registers and ledgers and inform the link office or the dealing office about the future commitments of the bank from the particular transaction. In each of these processes, a large number of cross-checking accounting entries have to be passed and recorded. In respect of merchandise transactions as there is a natural time gap of four to six months between the submission of a claim and its maturity, banks are required to take follow up actions on due dates. Banks also arrange for inward/outward remittances as permissible under the RBI rules. Maintenance and operations on different types of non-resident accounts are also governed by the Reserve Bank rules.

7.6 Export receipts or import payments in specified currencies arising at future dates are sold/purchased in advance by merchants to/from the authorised dealers. Consequently, banks make forward sales/purchases in money markets to cover their own positions against exchange rate fluctuations. These types of "deals" are undertaken in the dealing rooms of a few position maintaining offices of banks. These deals have to be confined within specified limits and banks are expected to achieve currencywise square or near square positions every day. The dealing room transactions involve spot (cash) or forward sales/purchases of foreign currencies against Indian rupees. Many times, two foreign currencies may be swapped against each other. Inter-bank sales/purchases are contracted through brokers while sales/purchases with the Reserve Bank are direct. These dealing offices are required to function in a very dynamic environment. The dealer must continuously update market reports and analyse them. He will be required to use great caution and

proper judgement in making on the spot decisions on multiple choices available to him to close the deals. The dealing room must have an uptodate position of balances in all Nostro/Vostro accounts, compiled on the basis of mirror accounts and transactions during the accounting period. Daily exchange rate scan sheet provides a record of overseas and domestric market rates.

7.7 The dealing room has a back up Accounts Department which monitors the position of the bank in various currencies and advises the dealing room to effect transactions. It first receives inputs from AD branches which transact merchant contracts and informs the Accounts Department about their spot and future currencywise receipts/payments. The Accounts Department has to maintain currencywise/countrywise profiles of the bank's position and match future purchases against sales by carrying out maturity analysis. It has to ensure that all the daily transactions and the position at the close of the day are within the rules prescribed by the Reserve Bank. The functions of Accounts Department involve keeping records of all dealing room transactions and subsequently entering into contracts. It initiates follow up actions and also maintains currency/funds positions and uptodate list of outstanding forward contracts, as well as their due dates. It receives sale/purchase advices from branches and manages all communications with parties. It compiles branchwise, customerwise, brokerwise, currencywise profile and works out brokerage/commission/payables and charges receivables. It estimates profit/loss on deals and prepares report for top management of the bank. It maintains several ledgers/registers for different types of deals and transactions of branches.

7.8 As stated earlier, foreign exchange business on merchandise trade is undertaken by a large number of branches of ADs. Many of them also operate on Nostro accounts of other branches. On the other hand, cover operations are undertaken by two to five dealing offices. Hence the accounts maintained in these three tiers have to be reconciled periodically. Prompt and accurate communication system to transmit information on transactions across the three tiers is a prerequisite to the efficient working of dealing rooms. The different types of risks that arise in dealing room transactions are risks of open position, mismatched maturities, non-fulfilment of obligations by one of the transacting parties, errors of judgement by dealers, non-adherence to the rules and procedures by AD branches and frauds of various types. Each of these types of risks can be avoided by exercising managerial controls specified under the Reserve Bank rules.

7.9 A cash sale/purchase of foreign currency by a bank results in a credit/debit entry in the mirror account of the corresponding Nostro account. These entries are made in foreign currency amounts as well as equivalent rupee amounts. These transactions affect the foreign assests position of the bank, with relative adjustments in profit and loss statement. Forward transactions are recorded in the mirror account on maturity. The Nostro account balances are actuals while mirror account balances are provisional and the value dating of balances gives rise to profit/loss on foreign exchange business. Interest applicable on credit/debit balances in Nostro accounts and exchange profit/loss are also recorded in profit and loss account. Sometimes, in swap operations, the cost of swap and interest on outlay of funds are recovered separately. Foreign banks/ correspondents statement of Nostro account balances have periodically to be reconciled with corresponding mirror accounts. This could reveal unauthorised transactions on Nostro accounts or unauthorised debits to mirror accounts.

7.10 Foreign correspondent banks/exchange houses maintain their accounts (Vostro accounts) with the Foreign Departments of Indian banks and issue TTs/MTs/DDs drawn on Indian banks which are payable in Indian rupees. The AD branches of Indian banks spread all over India honour these instruments on different dates but the debits on Vostro accounts are raised later, hence these debits have to be "Value dated" to avoid interest loss. The Vostro accounts have to be funded sufficiently and require close monitoring as overdrafts cannot be allowed without analysing the balance sheets of the foreign account holders. Floats on the accounts of more than 15 days have to be brought to the notice of the management and branches honouring TTs/MTs/DDs issued on Vostro accounts have to communicate the transactions to the Foreign Department on the same day, and daily closing balances have periodically to be got confirmed from account holders and reconciled.

7.11 Operations in foreign exchange business thus generate two types of information systems for control and maintenance of proper accounts. The Reserve Bank has prescribed different types of registers/ledgers to be maintained by AD branches, on the basis of which about 30 returns of different periodicities are submitted by AD branches to the Reserve Bank. Presently, about 7,400 branches of banks are reporting transactions to the Reserve Bank. Statement on the position of banks in various currencies held in different forms is advised on a weekly basis. Fortnightly returns relate to export bills negotiated/sent for collection, outward remittances effected against imports/non-imports and sale/purchase transactions in foreign currencies. The details regarding purpose, commodity, country, currency, terms of payment etc. are given in these returns. Balances in various currencies held abroad by ADs, Bid bonds and guarantees issued, statements on non-resident accounts and deposits of different types, blocked accounts, export letters of credit etc. are given in monthly returns. Statements on overdue export bills awaiting realisation and purchases in the form of travellers cheques, currency notes/coins and gift parcels exported are submitted every quarter.

7.12 Summarising, the salient features of the above procedures of conduct of FX business may be recapitulated. In the first place, there is scrutiny/verification of documents submitted by the customer, as prescribed under the rules on the basis of which AD would decide to undertake the transaction. The next stage is preparation of relative vouchers/advices to the concerned sections in the branch or in the Foreign Department of the head office. In certain cases, copies have to be endorsed to foreign correspondents. On the basis of these vouchers/advices, entries are made in registers/ledgers and the concerned accounts are credited/debited with appropriate contra entries. As the transaction may be spot or forward, follow-up action till the ultimate fructification of the transaction has periodically to be undertaken by properly diarising the due dates. The position maintaining offices acting on the advices of the branches have to enter into deals to keep square or near square position in all the currencywise Nostro accounts. The Accounts Department of the dealing rooms are required to maintain records of dealing room transactions and prepare periodical reports for the top management. The Foreign Department has to undertake periodic reconciliation of accounts as well as review P & L Statement of FX transactions. Statistical returns as prescribed by the Reserve Bank have to be submitted by ADs within specified periods.

7.13 FX business of banks is perhaps one area in banking business, requiring high skills in market operations, stricter control and vigil over transactions to avoid frauds and revenue losses. The

successful operations depend on uptodate analysis of market reports, speedy communications between different tiers and periodic reconciliation of accounts. The objectives of information systems on FX business thus should be (i) to have control over transactions with a view to avoiding risks of losses and frauds, (ii) to generate information on bank's foreign assets/liabilities and profit and loss from foreign business, (iii) to generate market intelligence reports to improve the efficiency of dealing room transactions, (iv) to improve customer services in speedily processing inward and outward remittances, and most importantly (v) to generate information on balance of payments statistics. This type of management information system can easily be linked to accounting information system.

7.14 The present problems in generating information systems on FX business of banks (which are entirely managed manually) are similar in nature to the problems of information system on domestic business. The problem is more severe in the case of FX business because of (i) the natural time lag of four to six months between the initiation and completion of most of the transactions and a continuous follow-up of a transaction is necessary with actions taken on due dates, (ii) initial credit/debit entries have sometimes to be reversed subsequently and (iii) accounting entries have to be reconciled between two or three tiers of branches on the one hand and foreign correspondents on the other. The RBI has prescribed formats of ledgers to be maintained, procedures to be followed and reports/returns to be submitted by branches to enable banks to control their branch operations. But the time limits prescribed for these activities are seldom adhered to. As a result, the controlling measures get slackened. Submission of information required for balance of payments tabulations is getting delayed by six to eight months. In the case of merchandise transactions, the export of goods may precede the financial transaction while for imports, the remittance may precede the arrival of goods. At present, there is hardly any follow up by the ADs by way of matching the shipping documents with the ultimate settlement of claims. Reconciliation of accounts with foreign correspondents is becoming increasingly difficult because of delays in raising the relative queries with foreign correspondents. Adherence to the book keeping procedures involving so many vouchers/registers/ledgers has been under considerable strain in the light of increased volume of transactions, administration of large number schemes to boost foreign trade and diversification of business, and above all, in ensuring that a particular transaction fits within the prescribed rules and regulations. Delays in updating Nostro accounts result in revenue losses to banks. The problems in customer service are equally acute. Inward remittances, particularly for credits into non-resident accounts, get inordinately delayed because of slow communication system. The FEDAI has introduced a system (Foreign Inward Remittance Payment System) for speedy disposal of these claims. But this system is applicable only for remittances not exceeding Rs. 10,000, and that too for accounts in the name of individuals.

7.15 It is clear from the foregoing account that mechanisation/computerisation of these operations has become imperative. The type mechanisation/computerisation needed for FX business is completely different from the branch level mechanisation discussed earlier in Chapters III and IV. Even in the FX business, the operations at the branch level are totally different in nature from the dealing room operations. At the branch level, once the basic documents are scrutinised and verified manually and basic vouchers/advices are prepared, it should be possible to generate on the computer system entries in all the concerned registers/accounting ledgers with appropriate time signal codes for follow-up actions. The credit/debit advices to Central Office Foreign

Department or to the link offices/deal room Accounts Department can also be generated as computer printouts. Contract forms with merchants and follow-up advices/reminders to defaulters etc. can also be generated in a similar way. The entire range of information that is being supplied to the Reserve Bank in various returns can be expedited as transaction level data can be sorted and summarised in any manner.

7.16 In Chapter IV, we had suggested two models of branch level mechanisation. The computer system support for FX business at the branch level will have to be designed on the lines of model II only. In this context, it may be pointed out that about 75 per cent of FX business is concentrated in the four Metropolitan cities of Bombay, Delhi, Calcutta and Madras, where implementation of model II may not be difficult. Hence in large branches, one microprocessor system (model II) can support both, the domestic and foreign exchange business.

7.17 The dealing room computerisation will have to be on different lines, working in a real time processing environment. It should have sufficient capability for being connected to other dealing rooms of the bank, through a communications network. Most of the deals in the dealing room are finalised through telephones system. Voice file recorders are now available which can be used as a back up of verbal communication between the dealer and the brokers. The voice file recorder also records simultaneously the time of the day of the deal. These data can be fed into the computer to print out the deal slips along with all the necessary particulars. The Accounts Department attached to the dealing room would also be supported by this computer system. The system will update all the ledgers as soon as the deal is completed and print the necessary advices. It would also generate advices on follow-up actions on due dates. All types of profiles — currencywise, countrywise, maturitywise etc. mentioned earlier in para 7.7 above can be generated on the system. All the control checks, warning signals etc., can be designed into the system. Many banks have already installed Reuter/PTI terminal systems which display on video screens the exchange rates for different currencies by different agencies. It would then be possible to design a programme which would indicate the most profitable choice from among different types of deals.

7.18 Balance sheets of foreign banks/exchange houses and their operating results can be stored on computer files and retrieved through terminal systems. These, together with data base on foreign country's economic statistics, could provide support to decision making process on policy issues in handling foreign business.

7.19 The computerised systems proposed above would ensure control over the FX transactions at the branch level and in the dealing rooms. All the accounts can be made uptodate and their reconciliation will be facilitated. Eventually a comprehensive management information system can be built up. It is, however, necessary to do an indepth planning and take advance actions in several areas before the computerised systems can be implemented. In the first place, a check list has to be prepared for each type of FX transaction to ensure that it fits into the RBI's rules and regulations as also into the procedures recommended by the FEDAI. This check list can be maintained in the form of code numbers in a master file on the computer so that, when the details of any transactions are inputted in the computer system, acceptance or rejection of a transaction could automatically be indicated. The coding systems for merchant contracts, brokers, etc., should also be evolved. Secondly, the format of vouchers/advices that forms the basic input to the computer system

should have preprinted codes. The format of sub-day book relating to foreign exchange transactions and various registers and ledgers in which entries are to be recorded should be standardised so that same can be maintained on the computer files. The primary ledgers relating to the customer accounts will be maintained on the system. A master file of currency conversion codes and the sequential order in which conversions are to be made will be specified to the systems. The Reserve Bank has already evolved a uniform code system for bank branches, but the same will have to be extended to the dealing rooms and foreign correspondents. Security and secrecy in foreign exchange operations has a high priority and these checks will have to be built into the system.

7.20 In undertaking foreign exchange business in general, and foreign exchange dealings in particular, banks in India operate in direct competition with large international banks, who have the assistance of very sophisticated computer based systems. These computer systems support all the accounting aspects, provide analysed information and even advise the personnel concerned about the desirability of quoting a certain rate of exchange or a specified deal. Such systems are developed in a real time environment around very reliable computer hardware and a highly intricate and comprehensive software. Development of such software requires considerable amount of time and effort, for a fairly large team of specialists conversant with computer systems as well as foreign exchange operations. While it would be very difficult for banks in India to develop such software within a short time, well developed and thoroughly tested software packages are available internationally. It would be a practical proposition for the major Indian banks to use such software packages until such time as they could develop such sophisticated software locally. As most of the well known international banking software packages are developed for specific internationally popular computer systems, it would be appropriate to allow major banks in India to import, on a one time basis, computer systems of the type best suited for foreign exchange transactions along with the necessary software packages, to enable the Indian banks to fulfil their role in this regard in the best possible way. We, therefore, recommend that the major banks may be allowed to import such computer systems, if needed.

CHAPTER VIII

COMPUTERISATION AT THE APEX AND REGIONAL LEVELS

8.1 This Chapter deals with the items in the head office/regional office functions which can be supported by computer systems. Pre-requisites for the efficient working of these systems are the standardisation of input-output formats, adoption of uniform code systems and arrangements for smooth data flows. An action plan in these areas is also discussed in this Chapter.

8.2 For the purposes of corporate planning, control and evaluation of the organisational performance, the head office of a bank needs two types of data bases supported by computer systems. The internal data base is to be built from operational statistics, originating from branch level transactions. The external data base arises from the economic environment in which the banking system operates. The sub-sets of internal data base relate to assets and liabilities, income and expenditure, management information on credit and deposits, funds and investment management, foreign assets and liabilities, administrative services, branch performance evaluation and housekeeping like inter-branch reconciliation. Financial, economic and monetary statistics on domestic and foreign economies would form the external data base.

8.3 Banks submit weekly Section 42(2) Return to the Reserve Bank on the basis of weekly abstracts of branch balances on various heads/sub-heads of accounts. In most banks, branches submit these abstracts to the regional/zonal offices where they are consolidated and the head office receives these consolidated figures. The Section 42(2) Return has about 25 items, but these are made up of about 100 sub-items to be reported by branches. A few items of assets and liabilities originate in the head office. Most of these sub-items are general ledger heads/sub-heads which are required to be balanced every day/week. However, 50 per cent of banks default in timely submission of these returns, even after taking into account the normal allowance of 28 days. Some banks have identified their important branches which show significant weekly variations and as soon as returns from these branches are received, the banks file their provisional returns. It is observed that small branches have no difficulty in filing their weekly abstracts on time. The main delay arises in respect of large sized branches, which have problems in balancing their books. With the implementation of branch level mechanisation recommended by us in Chapter IV, the problem of balancing will get eliminated and branch level weekly abstracts would be filed on time.

8.4 Along with branch level mechanisation, it will be necessary to standardise the heads/sub-heads in general ledger accounts. At present, these items vary from about 35 to more than 100 from bank to bank and compilation of weekly abstract requires a reference to other supplementary books of accounts. The Goiporia Committee which examined branch level records and accounting procedures had recommended some modifications in the books of accounts. We observe that some banks have made these weekly abstracts quite comprehensive by including information for internal control purposes. This could be one of the reasons why the weekly abstracts get delayed

from the branches. The general ledger gives balances on loan accounts according to type of loan (cash credit, overdraft, bills purchased/discounted, etc.), but the activity of borrower and the purpose of advance do not feature in the general ledger. The Goiporia Committee found that modifications in books of accounts to facilitate compilation of statistical returns would increase the heads/sub-heads of accounts substantially and it would affect compilation of the prescribed annual return on balance sheet items. Pending a review of balance sheet format, it recommended maintenance of schemewise subsidiary books of accounts. We feel that, if these recommendations are implementated and the general ledger format is standardised, it would facilitate compilation of weekly abstracts and several statistical returns.

8.5 Computerisation of weekly abstracts will help banks in (a) monitoring the receipt position and making estimates for defaulting branches, (b) editing of data with consistency checks, and (c) pooling up the zonal level information and working out statutory ratios. This information can be used by banks for credit planning, cash management, budgeting, liquidity monitoring, etc. The software development for this application is fairly simple. We, therefore, recommend that processing of weekly abstracts should receive priority in computer processing at the head office level.

8.6 Banks have now prescribed performance reports to be submitted by branches at monthly/quarterly intervals. This is a comprehensive report covering a wide range of branch activities. The report is analysed to assess relative performance of branches, regions and zones on different items. The processing of these reports can be done on the computer system with some extensions of the software developed for processing the weekly abstract. We, therefore, recommend that this item should also be taken up for processing on the computer system.

8.7 The next item in order of importance is the credit information system. This is the most crucial information for credit management by banks as well as for formulation of monetary and credit policies. The main bottleneck in the present system is at the branch level. In Chapter V, we have made recommendations on how this system may be designed on the basis of control cards for each loan account. This, together with the standardisation in general ledger heads/sub-heads and maintenance of schemewise subsidiary books of accounts, would improve considerably the efficiency of this system. With the establishment of microprocessor systems at the zonal levels, the head office computer system will receive inputs on the computer media which can straightaway be processed. The output of the system will be comprehensive credit data in the form of profiles of major borrowers and schemewise/regionwise credit sanctioned and utilised will also be available on tap. We, therefore, recommend that banks may implement the system on the lines suggested in Chapter V.

8.8 The BSR system is already computerised in the Reserve Bank. In addition, some banks are engaging outside agencies for data entry operations and processing of these returns. We recommend that banks should take up processing of these returns on their own systems. The program development for this item is, however, substantial, but with the assistance of the computer unit of the Reserve Bank, banks will be able to develop their own systems quickly.

8.9 Reconciliation of inter-branch transactions will be the largest single item to be processed on the computer system in the head office. Most of the banks are processing this item by engaging outside computer agencies. Despite this support, the reconciliation work is in considerable arrears. The main problem here is that the manual systems and procedures of transactions and their subsequent reporting have severe deficiencies. In this case also, the procedures vary from bank to bank. The Sub-Committee appointed by us to investigate into these problems, noted that in every stage of reconciliation, there are delays on the part of the branches and the head offices, and several types of errors arise in reporting schedules. The problem as analysed by the Sub-Committee is essentially of enforcement of dicipline and computerisation has not produced the desired result. We, therefore, recommend that the banks should modify their IBR procedures and ensure their prompt compliance by their branches. This item would involve high volume of data entry and we recommend that these operations may be undertaken at the zonal level. After editing the data and reformatting them for reconciliation exercise, the data on computer tapes can be forwarded to head offices of banks for being processed further on computer systems.

8.10 The administrative services which can be supported by the head office computer system are personnel inventory and manpower planning, pay roll processing and provident fund accounting and loans and advances to employees of the bank. Information on income-expenditure profit and loss and balance sheet items will be available in weekly abstracts and performance reports submitted by branches and the necessary outputs can be designed in the processing of these returns. Standard software packages on these items are available with the manufacturers of computer systems and these items can quickly be computerised.

8.11 In addition, cash and investment management and stationery accounting and control are some of the important items to be taken up on the computer systems. Banks may also find it useful to compile a directory of instructions issued to branches and their compliance by the branches. Several analytical studies can also be undertaken on the computer systems to help the decision making and policy formulations.

8.12 The external data base to be maintained on computer systems will be in the form of time series on financial, monetary and economic variables. The data base should be able to throw up comparative position of the bank vis-a-vis other banks, district credit plans in respect of lead districts of the bank, national income and allied indicators and data on operations of the term lending institutions, etc. For its developmental activities, district level information on relevant socio-economic indicators can be also stored. The scope of these data bases would depend on how the bank is utilising this type of information in its policy formulations. The data base will have to be so organised as to facilitate quick retrieval of information in meaningful formats.

8.13 To carry out all these functions at the head office level, it will be necessary for the banks to acquire a main frame system with sufficiently large capacity. The configuration of this system has been described in Chapter IX of the Report. From the point of view of overall economy, the smaller banks could go in for microprocessor systems with sufficiently large capacity,, instead of mainframe systems. However, care will have to be taken to ensure that such machines have adequate on-line storage to facilitate quick retrieval of data.

8.14 The zonal/regional offices occupy an intermediate tier in control functions; in fact, they have been charged with the responsibility for primary control and follow up of all operational matters in respect of branches coming within their jurisdiction. Therefore, except in regard to purely centralised functions such as investment operations, provident fund accounting, etc. the functions referred to in the foregoing paragraphs have to be discharged by them. The data from branches will have to be received by them and processed through computers for generating appropriate outputs to facilitate their control functions. The data will have to be transmitted thereafter to the head office for being stored in the mainframe systems to generate macro level information for the bank as a whole. Having regard to this, it will be necessary to equip zonal/regional offices with microprocessor systems for editing, processing and reformatting all types of data.The configuration of these systems should also include about eight off-line data entry machines.

8.15 We now come to the question of standardisation of input-output formats. The need for computerised support in respect of the above items is common to all banks and it would require a stupendous effort and considerable time, if each bank were required to develop its own software for these common items. Besides, it would be a duplication of effort resulting in high cost for the industry. Above all shortages in skilled personnel for systems analysis and programming would emerge and would cause delays in implementation. All these problems can be avoided with standardisation in input-output formats of items to be processed on the computer systems. This will make it possible to develop software for the common use of all banks.

8.16 It would also be necessary to adopt standard voucher formats with preprinted code numbers. Banks are already using different types of vouchers for different functions. If the type of function (credit/debit), nature of transaction (cash, clearing and transfer) and the head/sub-head of account are indicated on the voucher in code numbers, then data on the particular transaction can straightaway be inputted to the mechanised system and be got recorded appropriately. The output of the system will be the primary ledger, supplementaries, day book and the general ledger. With standardisation in the heads/sub-heads of accounts of the general ledger as proposed earlier, the output of the system will also be standardised.

8.17 Branch level outputs would form the inputs to microprocessor/computer systems in the higher tiers of banks. It is observed that, even in the case of statutory returns like Section 42(2) Return or the monthly Form X, the branches do not report to head offices in prototype proforma. Very often, branches submit disaggregated data on a number of items/sub-items and the head offices are required to summarise the same. If this processing is to be computerised, branch level abstracts/reports will also have to be standardised. In this context, it is noted that banks have been adopting different nomenclatures for the same types of transactions. We, therefore, recommend that a glossary of terms/items in various books of accounts be prepared and standardised with uniform code designs. Only then will it be possible to standardise the internal reporting systems for compilation of statutory returns on computer systems in head offices. Apart from the statutory returns, there are a number of statistical returns which are submitted branchwise. In the case of some of the bankwise returns, branch level reporting is, by and large, in the same format as the final return. Therefore, once the books of accounts are standardised, the inputs and outputs of statistical returns would automatically get standardised.

8.18 We visualise that, in due course of time, the data flows through various returns either internally within the banks or from banks to outside agencies will be in the form of computer tapes/floppy discs. Therefore, banks will have to adopt uniform and standard code numbers. The glossary of terms and standardisation in nomenclature proposed earlier constitute the first step in this direction. The coding systems used in (a) BSR system, (b) Credit Information system (c) Credit Authorisation scheme and (d) returns on Lead Bank scheme, Priority Sector advances and Twenty Point Programme need to be integrated. The Goiporia Committee had recommended a system for numbering loan accounts/borrowing parties. Under the MICR system for sorting of cheques, a coding design is prescribed to locate the drawee branch/bank. The Reserve Bank has instituted since 1972 a uniform code design for bank branches. It is necessary to have a fresh look at this coding system in the light of large scale expansion of branches and needs of mechanised systems. It is also a common experience that an extra exercise in coding the descriptive information in the returns creates a major bottleneck in data flows and results in inaccuracies of classification. Therefore, as far as possible, the formats may have to be designed with preprinted codes, wherever possible, with a provision for ticking off an appropriate code. All these problems will have to be carefully looked into. We recommend that the Reserve Bank may immediately examine all the coding systems with a view to removing existing deficiencies and standardising them. This task should be completed within three months so that necessary instructions may be issued well before the computer systems are installed.

8.19 Rationalisation of statistical returns is another exercise in standardisation of input-output forms. As stated earlier the branches are today burdened with more than 100 statistical returns of different periodicities some of which are quite complex and they involve duplication of compilation effort. We understand that the Indian Banks' Association had appointed a Committee to look into these problems and the Committee has recommended a set of rationalised returns. With the implementation of a rationalised system, coupled with standard coding designs and branch level mechanisation, we hope that the present burden of compilation of returns on branches will be lightened and branches will be able to file their returns on time.

8.20 The next important step in ensuring that computer systems in the higher tiers work efficiently is to arrange for expeditious data flows from the points of their origin to their entry point into the computer systems. The current procedures of data flows through hierarchical levels vary according to the type of information as also from bank to bank. Operational data used for control purposes flows along the channels which control the operations. In the case of submission of statistical returns, there may be a level jumping, as intermediate tiers may not be required to process and use these data. Even in such cases, the head offices of some banks find it convenient to route these returns through the intermediate tiers which can closely monitor the receipt of these returns and tackle speedily the non-response cases.

8.21 Weekly abstracts for compiling Section 42(2) Return are submitted by branches to zonal offices either directly or through the regional offices, and the zonal offices transmit the same to head offices. At each of these intermediate stages, data are consolidated and they flow further in the consolidated form. Credit information flows partywise upto the controlling level and thereafter, it flows up in a consolidated form. In the case of Basic Statistical Returns and schedules of inter-branch transactions, the information flows from branches directly to head offices. In functions

which have been delegated to regional/zonal offices, the head offices may not require branch level information.

8.22 Even under mechanised systems, these existing procedures for data transmission will have to continue for some time. In the first place, in computerised systems, the data have to be transcribed on computer media through data entry terminals. These data entry systems have to be established on a decentralised basis in zonal/regional offices. When this network is established, it should be possible to transmit data in multiple copies on computer media if needed or generate copies of required printouts to be sent to lower tiers as a feedback. If the intermediate tiers have to function effectively, they would have to participate actively in data processing and use the information in their own planning and control of banking operations.

8.23 Entrusting the data preparation activity (transcription on computer media) to intermediate tiers has another advantage. Credit operations of branches of all the banks have to be pooled together at the district level for district credit plans. The responsibility for collection and pooling of data on this account has been entrusted to the Lead Bank of the district concerned and has got to be done mostly by the regional/zonal offices. As for establishment of data entry and microprocessor systems in these offices, it may not be possible for banks to provide such facilities in each of their regional/zonal office. Therefore, in some places, consortium arrangements may have to be worked out by banks so that the facilities become available in each state/divisional head-quarters.

8.24 To sum up : The three points made out in the above discussion may be emphasised. First, the banks should not design their reporting systems that would require additional manual effort in numerically coding the information, which is essential for mechanical processing of data. In many organisations, computer systems have become inefficient largely because of inaccuracies and delays in coding of information. Hence, when the banking industry is embarking upon mechanisation, this pitfall should be avoided particularly in the context of the high volume of data it will have to process. Secondly, it would be beneficial to all banks if they were to develop and exchange common software packages for their apex level computer systems. This would be possible only if uniform procedures and coding designs in all banks are instituted at this stage itself. Lastly, computer technology now makes it possible to take the data capture and their processing facility at the points where data get generated and, for optimisation of performance, these facilities will have to be established on a decentralised basis. Therefore, the banking industry should avoid concentration of these facilities in the head office only.

CHAPTER IX

PROGRAMME OF MECHANISATION AND ITS IMPLEMENTATION

9.1 In the earlier Chapters, we have discussed the banking functions which are amenable to mechanisation, the type of branch level mechanisation needed and the modifications necessary in the existing procedures for working the mechanised systems with high efficiency. At the branch level, the functions to be mechanised are primary ledger postings and writing of supplementaries, day book and general ledger and preparation of schedules for reporting inter-branch transactions. The zonal/regional offices are to be entrusted with the transcription of data on computer media, their validation and editing and processing to a certain extent. In the head offices, compilation of various returns, performance of some types of administrative services, reconciliation of accounts and maintenance of data bases are to be computerised. In addition, money market operations, foreign exchange dealings and funds and investment management are also to be supported by computer systems. Clearing houses would have microprocessor systems supported by MICR equipments in the four metropolitan cities of Bombay, Delhi, Calcutta and Madras, while at other places clearing house settlements would be facilitated by microprocessor systems. In this Chapter, we suggest a programme of mechanisation in banking industry and give the estimates of resources needed to implement the programme. The advance action to be taken by banks in (a) identification of personnel and arranging for their training, (b) planning the selection of hardware and development of software and (c) provision of infrastructural facilities is also discussed.

9.2 While embarking upon a large-scale programme of mechanisation, it is not enough to consider only the functions to be mechanised and the types of equipments needed for mechanising these functions. The problems associated with transition from the old system to the modern mechanised system have to be anticipated and tackled suitably. The geographical spread of banking business is highly skewed and the infrastructural facilities are also unevenly developed in different territories. In relation to the magnitude of the task involved, banks will require some time to create an awareness about the computer culture within their managements and employees and develop necessary resources. In this context, it would be useful to review the spread of the industry. Table No. 1 below gives the classification of banked centres according to population group and number of bank branches as at the end of May 1984. There are about 100 centres which account for more than 10,000 branches. A list of these centres has been given at the end of Chapter II. There are about 22,000 centres with one or two branches each. The macro-level information on about 70 per cent of advances and 60 per cent of deposits could be captured by covering 10,000 branches of the industry. Nearly, 94 per cent of loan accounts have credit limits of less than Rs. 10,000 each, but these loans form only 15 per cent of the total outstanding loan. The distribution of branches according to the number of transactions processed per day is also an important determinant to work out the phased programme of mechanisation, but this information is not available at present. As a proxy, the distribution of branches according to population groups given in Table No. 1 below could be considered.

TABLE NO.1

CLASSIFICATION OF BANKED CENTRES AND NUMBER OF BANK BRANCHES AS AT THE END OF MAY, 1984

Population Group	No. of Centres	No. of Branches
Rural	21,947	23,970
Semi-urban	2,974	9,145
Urban	207	7,097
Metropolitan	12	5,521
Total	25,140	45,733

9.3 The above narration would show that the banking system is working in a dual environment. With high concentration of business in about 2000 - 3000 branches located in a small number of centres, macro-level information system can be generated by mechanising these branches. But analytical information for policy formulation and evaluation of credit plans under different schemes would require a much larger coverage of rural and semi-urban branches. It would, therefore, seem that information flows under mechanised system will have to be aligned properly to flows under manual systems. Non-availability of infrastructural facilities in many centres would also necessitate this type of arrangement.

9.4 The September 1983 settlement between the Indian Banks' Association and the All India Banks Employees' Association and the National Confederation of Bank Employees, on the question of mechanisation/computerisation of bank branches specifies that electronic accounting machines may be used in bank branches for the purposes of processing transactions on deposit accounts, cash credit and loan accounts and general ledger accounts. In the rural and semi-urban areas, these machines are to be used only in branches where the clerical strength exceeds 15. The use of mini-computers would be restricted to one computer per bank for each Area I centre and an additional one for every 200 branches/offices, with a maximum of 18 mini-computers per bank, whichever is lower. The Committee, therefore, addressed itself to the immediate task of implementing the programme as specified in the IBA settlement and has drawn up a five year programme of mechanisation to be implemented in two stages. The bank branches and zonal/regional offices to be mechanised/computerised would largely be located in the top 100 centres already listed in Chapter II of the Report. The detailed programme of mechanisation along these lines is given below. However, in the context of fast changing computer technology and the need for coordinating the programme of mechanisation with the programme of developing

infrastructural facilities, we recommend that a detailed review of the programme of mechanisation should be undertaken before the end of the first stage.

9.5 The Committee recommends that the five year programme of mechanisation should be implemented in two stages, the first stage covering a three year period (1985, 1986, 1987) and the second stage covering the next two years (1988 and 1989). In the first stage, mainframe computer systems should be installed in head offices of banks and made fully operational. These systems will support maintenance of accounts and reconciliation, management information on credit and deposits, administrative services named earlier and data base management. The configuration required for the mainframe system would be one megabyte real memory, 200—400 megabytes of disc storage supported by two floppy disc drives, three tape drives and two line printers and a few on-line inquiry terminals. The system may also have a card reader, if found necessary. There could be some variations in this configuration, depending upon the size of the bank and the volume of data it proposes to process on the system. In any case, the system should have upgradation potentiality.

9.6 In stage I, zonal and regional offices controlling about 200 branches should be equipped with microprocessor systems supported by adequate configuration of off-line data entry terminals. The configuration of a typical system would be one megabyte of real memory, eighty megabytes of disc storage with one or two floppy disc drives, one or two tape units, one line printer and about eight off-line data entry machines. These systems will take over transcription, editing of all the data flows emerging from branches under their jurisdiction and transmit all the information to head offices on computer tapes/floppy discs only. The clearing houses in Bombay, Madras, New Delhi and Calcutta will be equipped with MICR equipments and national clearing will be introduced. Computerisation of settlements in clearing houses in other cities managed by the Reserve Bank will also be introduced. Banks will establish service offices in important centres as suggested earlier.

9.7 In regard to mechanisation of bank branches, we recommend that branches in metropolitan centres and other urban areas having a workload generally of about 1,000 vouchers per day should be equipped with model I or model II machines described in Chapter IV, during stage I of mechanisation. This need not, however, preclude introduction of such machines at branches even with a workload of less than 1,000 vouchers per day, if it is found desirable from the point of view of customer service. It is estimated that there might be about 2,500 such branches which need in all about 10,000 electronic ledger posting machines (model I) as described in Chapter IV. A few larger branches would have model II machines. While it is desirable that the programme of mechanisation in the three tiers is implemented as a package, the installation of the mainframe systems and microprocessors in higher tiers need not be held up till branch level mechanisation is completed.

9.8 In stage II of mechanisation to be implemented during 1988-89, the branch level mechanisation as described earlier should be extended further to about 6,000 branches. It is expected that some of the branches in metropolitan centres and urban areas which are presently having a workload of about 500 vouchers per day would have enlarged their business to about 1,000 vouchers per day and these branches will then be covered under the programme of mechanisation. Thus, the Committee recommends that, within the next five years, about 8,500

branches should be equipped with electronic ledger posting machines with attached memory or model II type of machines. Simultaneously, all the zonal/regional offices will be equipped with microprocessor systems and the apex level computer systems will support all the areas of operations and management control.

9.9 At present, the communication between different banks is mostly through postal mail, telegraphs and telex messages. Apart from statistical returns which flow from branches to head offices, authorised money transfers from one branch to another are also effected through these systems. These communication channels can greatly be improved, if dedicated service lines in about 25 Indian cities become available to the banking industry. Transfer of messages through computer aided communications network would be not only faster but also cost effective. We understand that such a facility is now being developed by the Department of Electronics and the Computer Maintenance Corporation.

9.10 The implications of the above programme of mechanisation in terms of the resources needed are given in Table No. 2.

TABLE NO. 2

RESOURCES NEEDED FOR THE PROGRAMME OF MECHANISATION

1.	Number of banking centres to be covered (approximately)	100
2.	Number of branches to be mechanised	
	Stage I	2,500
	Stage II	6,000
3.	Number of ledger posting machines with attached memory	
	Stage I	10,000
	Stage II	20,000
4.	Number of microprocessors in big branches and in zonal/regional offices	
	Stage I	200
	Stage II	100
5.	Number of mainframe computer systems at the apex level	25
6.	Total cost of hardware in Stage I	Rs. 135 crores
7.	Additional cost of infrastructure	Rs. 15 crores
8.	Number of operators required	40,000—45,000
9.	Number of system analysts and programmers	About 1000

9.11 The above estimates are based on the assumption that a branch would need, on an average four electronic ledger posting machines with attached memory or one model II type machine described in Chapter IV. A regional/zonal office will need one microprocessor system with about eight terminals and the head office will need one mainframe system. The estimates of cost are based on the present unit costs of the machines available in the market. The costs may go down to the extent there is a reduction in the unit costs, arising from the large demand that would be generated in the next two or three years.

9.12 We have estimated the personnel requirement at about 40,000—45,000 operators and

about 1,000 systems analysts and programmers. These requirements will be met largely from the existing staff only by arranging for their training to develop necessary skills. Banks will also need to develop considerably managerial skills for proper coordination between data suppliers, data users and the EDP departments. For branch level operations, ledger posting machines will be designed for dedicated functions, for which the manufacturers will supply software packages. With standardisation in procedures and input-output formats, the main requirement at the branch level would be that of operating personnel. Here, the same set of personnel who are today engaged in manual functions on different desks should be able to operate these machines with about 10-15 days of training.

9.13 The manufacturers of computer equipments may be ready to supply tailormade software packages along with their systems. Banks may initially find it advantageous to rely on them for software support, but, in the long run, the industry will have to pay heavy cost for delay in developing necessary skills within their organisations. Even if common software packages were to be developed by a consortium of banks, it would still be necessary to train systems analysts and programmers within individual banks. Time is now opportune to spread the technical knowhow to create an awareness among the employees of the usefulness of mechanisation in increasing the efficiency of banking system. In this task, the banks will have to identify suitable personnel within their organisation who have aptitude and potentiality to work as systems analysts and computer programmers. The personnel selected for this purpose should have adequate knowledge of banking practices and functions in different tiers of banks. Banks may also have to recruit a few qualified systems analysts and programmers to speed up computerisation of different items.

9.14 Considering the programme of mechanisation recommended by us, we estimate that the banking industry would need to train about 300-350 systems analysts and about 700 programmers within the next one year. Training of systems analysts may be arranged parallelly in four channels, at suitable centres in India. Each course should cover systems analysis for computer applications on accounts and reconciliation, statistical returns under management information systems, administrative services enumerated earlier and miscellaneous applications. Training programmes may be conducted under the auspices of the National Institute of Bank Management with the assistance of other banking training institutions. The trained personnel could develop common software packages for the use of banks. However, a necessary condition for such an arrangement is the compatibility of computer systems in different banks and adoption of common and standard procedures and formats of books of accounts. This programme of training may be followed by advanced courses in the second year. Training courses for programmers may be arranged in-house by each bank by engaging professional teachers available in the market. Selected personnel may also be encouraged to join private courses by providing suitable incentives.

9.15 Another aspect which will require careful attention of banks is the career path for the EDP personnel. Mechanisation/computerisation is going to be the foundation of management information system within next ten years and professional expertise in computer techniques will have to be developed by banks. Against this background, the banks will need to consider whether a separate cadre of EDP personnel should be created within banks, with sufficient promotional prospects. In any case, there should not be high mobility of staff assigned to EDP functions, as

considerable investments will have to be made in developing competence and expertise of the staff.

9.16 We have already stated in Chapter IV that, in the implementation of the programme of mechanisation, parallel runs between the existing manual systems and the new mechanised systems at the branch level will be necessary. This would ensure that all the transactions are accurately recorded and the customers are not inconvenienced in any manner. In this context, we examined the security measures that will have to be provided in passing transaction entries under the mechanised procedures. In the manual system, most of the entries are first recorded in hand and every entry is initialled by a competent official, to authenticate the same. Specific provisions have been made for the safe custody of all the ledgers, vouchers, etc.

9.17 In the mechanised procedures, entries will be recorded first on computer media and then passed by an official. Physical verification of entries on the video screens of ledger posting machine will also be backed by a printout of listing of the day's transactions, each entry of which will have to be verified against the relative voucher and initialled by an officer. To prevent unauthorised operation of the machine, we have suggested in Chapter IV that, apart from the physical lock and key arrangements on the machine, initialisation of machine at the commencement of the day's business should be done by a competent officer by entering a secret password and the operator using the machine will also use his own password while operating the machine. Such facilities are now built into the processing software which the manufacturers deliver along with the machine. These provisions would ensure that transactions are recorded or read only by authorised persons.

9.18 Sometimes it is possible that the floppy discs or other magnetic media on whith the ledgers would reside may go bad. There could be unintentional damages to the data on these media. Hence it is necessary that hard copies of day's transactions, day books, general ledger, etc., are taken out daily. Statements of accounts of the customers should also be generated periodically. All these copies should properly be bound, indexed and stored as per the safe custody procedures in the manual systems.

9.19 The matter of evolving detailed security measures, checks and safeguards to prevent tampering of records by unauthorised persons and computer frauds involves considerable work in detail. We suggest that, as discussed in Chapter IV, the IBA should deal comprehensively with this problem and come out with precise guidelines to be followed by the banking industry. It should actively associate the Department of Electronics and the Computer Maintenance Corporation in preparing these guidelines.

9.20 In the light of the above discussion, an advance plan of action may be suggested. Each bank will have to make its own assessment of the organisational capability to absorb the new technology and chalk out an operational plan for implementation of programme of mechanisation. For this purpose, we recommend that the banks should create EDP Cells in their organisations. In regard to choice of hardware, the Cells could draw upon the expertise of professional bankers and computer specialists. The immediate tasks before the Cells will be as follows:

(a) Identify the important branches, preferably located in 100 common centres and preparation of a five year plan for their mechanisation. The volume of each type of activity in the selected branches and the likely growth in it in the next three to five years should be ascertained and the number and type of equipments needed should be estimated and acquired.

(b) Identify the personnel within the bank with aptitudes and potentialities to absorb related training and to arrange for their in-house training in programming.

(c) Fix up priorities of items to be processed on the mainframe computer system in the head offices and to assess the volume of workload in the next 5-7 years. The hardware configuration required may be worked out and steps to acquire the hardware equipments be initiated.

(d) Conduct workshops and systems studies to examine modifications necessary in the existing procedures, preparation of standards and procedures of work, documentation of new procedures, etc.

(e) Examine the infrastructural problems in branches selected for mechanisation and to initiate appropriate steps.

(f) Work out a time bound programme of action and to guide and oversee its implementation.

9.21 The plans and activities of banks in the implementation of mechanisation will need considerable coordination and guidance in various areas. After ascertaining the total requirements of various types of equipments, suitable standards for hardware will have to be evolved and dialogues initiated with the manufacturers of equipments. A plan has to be chalked out for creating the necessary manufacturing capacity and decide on the imports of knowhow and the electronic parts as are needed by the indigenous industry. Systems in different banks will have to be made compatible to facilitate exchange of data on computer media as also exchange of software packages. For this purpose, it will be necessary to bring out a degree of uniformity in the systems, procedures and practices followed by different banks. Systems analysts and programmers have to be given technical training and made fully familiar with the requirements of the banking industry. The bank executives and officials will have to be familiarised with the computer potentialities.

9.22 The coordination of all these activities calls for a considerable amount of effort. The Committee, after carefully examining several alternatives, found that the IBA, which is the collective body of the top managements of all the banks, should justifiably take over this responsibility. The IBA, as it is constituted at present, may not have the necessary infrastructure to perform this task. However, it is necessary and possible to create such capabilities at the IBA to carry out these important functions. While the IBA should take the overall coordinating responsibility for the implementation of the mechanisation programme in banks, it should be supported in this endeavour by Government agencies and other apex level institutions already in existence. For example, in regard to developing common software packages, it could draw upon the resources currently available or that would be created in the Computer Maintenance Corporation and the National Institute of Bank Management. The IBA may also examine the feasibility of creating a separate structure, if need be, for development of software support on an ongoing basis. The NIBM, as the apex level training institute, would of course have to take a major share of responsibility for conducting the training programmes for the system analysts, the programmers and the bank personnel.

9.23 It may be useful to set up a Standing Committee in the Reserve Bank of India to monitor the implementation of the programme and help in resolving the problems that might arise from time to time The Committee could be headed by a Deputy Governor and consist, inter alia, of representatives drawn from the Department of Electronics, the Ministry of Finance and the IBA. In the initial stages of the implementation of the programme, the Committee should meet at least once a month to take a stock of the progress made and work out measures for speeding up the process of implementation.

9.24 In the context of the large-scale requirement of equipments needed in the programme of mechanisation, it is necessary to create sufficient manufacturing capacity and also allow import of know-how and electronic equipments. The Government has already laid down comprehensive policies in this regard and we understand that a proposal for manufacture of mainframe computer systems in India under the scheme of transfer of technology is under consideration of the Government. The indigenous computer manufacturing industry is also rapidly growing. We feel that the needs of branch level mechanisation are fairly simple and though the requirements of the equipments are in large numbers, given the necessary guidance and assistance, the indigenous manufacturers will be in a position to meet these requirements. The Department of Electronics should coordinate activities of the manufacturers and work out a plan for manufacture of the equipments in line with the banking industry's plans for mechanisation.

CHAPTER X

SUMMARY AND RECOMMENDATIONS

The Problem:

10.1 Since the nationalisation of 14 major banks in July 1969, the banking industry has undergone a phenomenal transformation. During the decade 1970 - 1980, there has been a four-fold increase in the number of bank branches, a six-fold increase in deposits and a five-fold increase in advances. As at the end of 1980, the industry had more than ten million customers, with an estimated three million transactions and one million inter-branch transfers per day. The banking business also got widely diversified during the Seventies with the establishment of linkage between credit expansion and development plans and priorities.

10.2 These repid developments resulted in considerable strain on the organisational structure of the industry. Along with the growth of banking business, not only the information systems are required to be restructured in regard to their contents for house-keeping, operational controls and policy formulations, but the methods of data capture at the branch level and their subsequent transmission through different tiers of the banking system are also required to be modernised. Many of the problems of the banking industry are inherent in the manual systems of operations and apart from their adverse impact on customer services, the deficiencies in the present manual systems pose grave dangers to banks in the context of increasing incidence of frauds. The need for switching over to mechanised systems aimed at removing these deficiencies has become imperative. Though the banking industry with its 45,000 branches is spread in 25,000 centres, nearly 60 to 70 per cent of the business is concentrated in about 10,000 branches located in about 100 centres. This would indicate that the mechanised systems to be introduced in large branches will have to be aligned with the manual systems in small branches spread throughout the country.

The Objectives:

10.3 With the explosive increase in the activities of banks and wider geographical coverage, a degree of mechanisation has become essential if the basic functions of banks such as services to customers (depositors and borrowers), uptodate maintenance of various general ledger accounts and reconciliation of transactions among branches, and generation of required data for control and monitoring are to be performed efficiently. The process of mechanisation in the banking industry will have to be such, as to include activities at the branch, regional and head office levels with the emphasis varying from one level to another.

10.4 Identification of areas for mechanisation rests on three considerations, viz., (i) volume and type of data required to be captured, (ii) objectives of information to be extracted from these data and the type of processing involved and (iii) the form in which these data are to be stored and retrieved subsequently. At the branch level, the objective of mechanisation ought to be

improvement in customer services and quality of house-keeping, as also to generate data for control and management information systems. The mechanised system will have to be designed so as to ensure generation of books of accounts as a by-product of branch level operations. At the regional and head office levels, the purpose of mechanisation would be to store, analyse and retrieve data in formats useful for analysing operational efficiency, formulation of management policies and their evaluation. The data bases in these higher tiers of banks will have to serve the dual purposes of economic analysis for long term planning and giving indicative signals, over a short term, about organisational performance.

Branch Level Mechanisation:

10.5 The main problem area at the branch level is accurate posting of entries in ledgers and other books of accounts and their balancing. These activities can be mechanised under two alternate models. In model I, stand alone electronic ledger posting machines with attached memory modules will be installed to perform dedicated functions at different counters. The machine will have a typewriter keyboard, a video screen, a printer and two floppy disc drives. The machine at the deposit/loan counter will store account level basic information, accept data on current transaction and update the balances. The machine will also generate statement of accounts for customers and work out periodically products and interest accruing on accounts. One of the machines will be designed to generate day book and general ledger. Adequate precautions in preserving security of operations will be provided in operating procedures; for example, a list of transactions entered in the machine will be generated at the end of the day and checked with relative vouchers. On an average, a branch may need 3-4 of such machines. The Committee understands that these types of machines have been installed in a few branches of two-three banks for a pilot run.

10.6 In alternate model II of branch level mechanisation, which may well be suited for large branches, a single microprocessor based system will be installed in a branch. In this model, vouchers will be posted manually in primary ledgers as at present and thereafter, information will be entered into the microprocessor system to generate supplementaries, day book, general ledger and other statistical returns.

10.7 The Committee recommends that branch level mechanisation should be effected on the above lines. The implementation of either of these models in branches will necessitate changes in work procedures, particularly, a complete switchover to Teller System. It will also call for additional security measures, which should be designed by the Indian Banks' Association. Parallel runs will have to be planned between manual and mechanised systems till the machine procedures are made fool-proof. The reduction in workload after mechanisation may not be more than ten per cent but with increased efficiency due to mechanisation, the growth in the volume of business will ensure that the overall employment potential of the banking industry is not affected.

10.8 Apart from maintaining the books of accounts, branches are totally responsible for speedily generating the credit information system. The banking industry today has more than two crores of borrowal accounts but 94 per cent of them have credit limits of less than Rs. 10,000 and these accounts are spread throughout the country. Compilation of various statistical returns requires

repeated sorting and summarisation of account level information. This is a very tedious task and serious bottlenecks have developed in generating a comprehensive credit information system.

10.9 The Committee recommends that this information system should be built up in the form of a master file containing one time basic classificatory information and a transaction file containing month-end balances on each account. Branches should maintain control cards with the basic information for each account. Monthly balances are already being recorded on jotting sheets in most of the branches and carbon copies of control cards and jotting sheets should be sent by branches to zonal/regional offices at periodical intervals where the information will be stored on the microprocessor systems. The two files when linked will be able to generate comprehensive credit information system. Classificatory codes and nomenclatures of different types of transactions should be standardised and frequent changes in the proforma should be avoided.

10.10 The traditional function of banks of clearing cheques lodged by customers is presently under tremendous pressure, resulting in some delay in clearing systems. This is a highly sensitive area where the customer's dissatisfaction is strongly expressed. The Reserve Bank has already computerised clearing house functions in Bombay, New Delhi and Madras and clearing houses in other major centres will shortly be covered under this programme. However, the main process of clearing of cheques involves sorting of cheques in branches and the technique of "item processing" with Magnetic Ink Character Recognition technology is being introduced in large branches in the four metropolitan cities, under the National Clearing System.

Mechanisation in Zonal/Regional Offices :

10.11 The zonal /regional offices of banks are organised on a geographical basis, depending upon the concentration of branches within the respective areas. These offices exercise control over branch operations, ensure follow-up of head office instructions and monitor receipt and scrutiny of branch level data. The objectives of mechanisation in this tier are : (1) capture data on computer media such as floppy discs/tapes, (ii) edit and transmit these data for a direct input to the mainframe computer systems in head offices of banks and (iii) undertake limited processing to generate information for operational controls.

10.12 Thus in the intermediate tiers, the zonal/regional offices of banks should have microprocessor systems with adequate numbers of off-line data entry machines. They will receive data from branches and after their scrutiny, transcribe them on to floppy discs for being processed on the microprocessor systems to be installed in these offices. Besides editing and analysis of data for control purposes, the zonal/regional systems will mainly support data entry operations and exchange of information on computer tapes/floppy discs.

Mechanisation at the Apex Level :

10.13 Head offices of banks at the apex levels are responsible for corporate planning, policy formulations and monitoring of institutional performance. The main objective of mechanisation in the head office should be (a) orderly storage of data in meaningful formats and their retrieval, (b) analysis of data to exercise control and audit checks, (c) generation of reports for management, policy formulation and evaluation of performance and (d) maintenance of external data base on

domestic and international economies. In addition, efficiency of administrative services can also greatly be improved with mechanisation. Bulk of these data would need batch processing

10.14 On receipt of data from the zonal/regional offices, head offices of banks should undertake on the mainframe computer systems detailed tabulations and analysis of various statutory and other statistical returns. Banks should computerise processing of weekly Section 42(2) Returns, monthly performance reports of branches, investment and funds management, credit Information system designed on the lines recommended earlier, Basic Statistical Returns, reconciliation of inter-branch transactions, and analytical research to support policy formulation. In addition, provident fund accounting, pay roll processing and personnel inventory data should also be handled on these systems.

Computer Support for Foreign Exchange Transactions :

10.15 Along with the growth of domestic business, banks have also expanded their international banking business. More than two million foreign exchange transactions per year are being handled by about 12,000 branches of authorised dealers. At the branch level, model II type machine installed for supporting domestic business would be adequate to meet the processing requirements of foreign exchange transactions. But the dealing room activities will require powerful computer support in a real time environment. The dealing transactions involve on the spot responses and, therefore, call for different types of skill and area. banks in India have to operate in direct competition with large international banks have very sophisticated computer system support. As Indian banks will require considerable time and effort to develop such computerised systems, it would be appropriate to allow large banks to import, if needed, computer systems along with the relevant software packages to increase the operational efficiency of their foreign exchange transactions.

Pre-requisites of Mechanisation :

10.16 Many banks have engaged outside computer agencies to process reconciliation of inter-branch transactions. This exercise has pointed out that appropriate linkages have to be established between computer processing and attending manual procedures preceding and following the computer exercise. Such linkages involve standardisation or input-output formats, adoption of uniform code systems and arrangements for smooth data flows across the three tiers of banking industry after their formatting and speedy transmittal by branches. The first step in standardisation is to prepare a glossary of terms and nomenclature for various procedures in banking business and adopt uniform coding systems. General ledger and other books of accounts should be standardised. The Reserve Bank should examine all the coding systems with a view to bringing uniformity. Input formats may be designed with pre-printed codes to avoid extra effort of coding the forms. Banks have found it convenient to monitor and control receipt of branch level data through their zonal/regional offices. This practice should continue as at present, as these intermediate level offices are to be entrusted with the work of transcribing data on computer media.

Implementation of the Programme :

10.17 The Committee recommends that the programme of mechanisation in banking industry should be implemented in two stages. In the first stage, covering the three year period 1985-1987,

head offices of banks should be equipped with mainframe computer systems. This system should have one megabyte of real memory, 200-400 megabytes of disc storage, tape drives, line printers and a few on-line inquiry terminals. Zonal/Regional offices controlling about 200 branches should be equipped with microprocessor systems comprising one megabyte of real memory, 80 megabytes of disc storage, floppy disc and tape drives, line printer and eight off-line data entry machines. At the branch level, model I or model II types of machines should be installed in branches generally having a workoad of about 1000 vouchers per day. It is estimated that there would be about 2,500 such branches. However, branches with lesser workload may also implement either of these models, if it is found desirable for improving customer services. In stage II of mechanisation (1988 & 1989), additional 6,000 branches should be mechanised. While it is desirable that the programme of mechanisation in the three tiers is implemented as a package, the installation of the mainframe systems and microprocessors in higher tiers need not be held up till branch level mechanisation is completed. In the context of fast changing technology and the need for coordinating the programme of mechanisation with the programme of developing infrastructural facilities, the Committee recommends that a detailed review of the programme should be undertaken at the end of stage I.

10.18 In stage I of the programme of mechanisation, the banking industry would need about 10,000 electronic ledger posting machines (model I), 200 microprocessor systems for large branches (model II) and zonal/regional offices and about 25 mainframe systems for head offices. The total cost of the hardware is expected to be around Rs. 135 crores. Banks would require about 40,000-45,000 operators at the branch level and one thousand systems analysts and programmers at the apex level. These personnel requirements should largely be met from the existing staff. The training of programmers should be handled in individual banks. The training of systems analysts should be conducted by the National Institute of Bank Management, with the assistance of other training institutions.

10.19 Each bank should set up immediately EDP cells and take advance action in identifying branches to be mechanised, acquiring necessary equipments and attending to all the infrastructural problems. They should examine the modifications necessary in the existing work procedures and lay down standards and procedures under mechanised systems. They may also consider whether a separate cadre of EDP personnel should be created within banks.

10.20 Implementation of the programme of mechanisation on the above lines will require considerable planning and coordination between banks. The matter of specifying detailed security measures, checks and safeguards to prevent computer frauds and tampering with computer media would involve considerable work in detail. Suitable standards for hardware will have to be evolved and the necessary capacity will have to be created for manufacturing and maintaining the equipments. Systems in different banks will have to be made compatible and common software packages will have to be developed after bringing about a degree of uniformity in systems and procedures. Training and dissemination of knowledge will have to be arranged at all levels.

10.21 Planning and coordination of these activities call for a considerable effort and the Committee, after examining several alternatives, recommends that the IBA should justifiably take over this responsibility. It is true that the IBA as it is constituted today does not have the necessary

infrastructure to shoulder these responsibilities. However, it is necessary and possible to create such capabilities at the IBA to implement these functions. It should be assisted in this endeavour by the Government agencies and other apex level institutions already in existence. A Standing Committee should be set up in the Reserve Bank of India, under the chairmanship of a Deputy Governor of the Bank to monitor the programme and help in resolving problems that might arise from time to time.

10.22 In the context of the large scale requirements of mechanical equipments, it is necessary to create adequate indigenous manufacturing capacity and allow for the import of technical know-how and electronic equipments as are necessary. The requirements of branch-level mechanisation, though large in numbers, are fairly simple and given the necessary guidance and assistance, the indigenous manufacturers should be in a position to meet these requirements.

List of Recommendations :

10.23 The main recommendations of the Committee have been given in the above summary. The detailed recommendations made in different Chapters are as follows :

1. The Committee recommends that the process of mechanisation should encompass activities at the branch, regional and head office levels, with emphasis varying from one level to another. (Para 3.6)

2. At the branch level, system will have to be so designed as to ensure generation of data as a by-product of the operations at the branch level. (Para 3.7)

3. Branch level mechanisation should be implemented under either model I or model II of mechanisation. Under model I, stand alone electronic ledger posting machines with attached memory modules will be installed. The machine will have a typewriter keyboard, a video screen, two floppy disc drives and a printer. The machine performs : (a) maintenance of primary ledgers and posting transaction entries in them, (b) working out products and interests at periodical intervals, (c) prepares statement of accounts for customers and (d) listing of standing instructions to be executed in the accounts. For different counters dedicated functional machines should be developed. For example, one of the machines will be designed to generate day book and general ledger. On an average, each branch may need three or four such machines. In alternate model II of mechanisation, a single microprocessor based system of large capacity will be installed. This machine will store all the primary ledger and general ledger accounts and besides performing all the functions of the electronic ledger posting machine described above, it will print out various statistical returns and statements for branch level information system. (Paras 4.18 to 4.28).

4. While the choice of either model I or model II of mechanisation to be made at any branch would depend on the circumstances obtaining it, model II of mechanisation will be best suited for big branches. (Para 4.29).

5. Introduction of machines at the branch level would call for changes in work systems. Existing checks and counter -checks should not be discontinued and additional safeguards should be built into the operating procedures. It will be useful if the branches which introduce these

machines switch over to a Teller System. The working out of comprehensive checks and safeguards would have to be given top priority and should be a condition preceding the introduction of machines. (Para 4.31 and 4.32)

6. For recording cash payments/receipts, modified versions of cash registers may be introduced. (Para 4.33)

7. Banks may select a few branches and implement either of the models on a pilot basis. During this period, parallel runs as per the existing manual procedures and new machine procedures may be undertaken. (Para 4.35).

8. Credit information system may be built up in the form of a master office file containing one time classificatory information on each borrowal account and a transaction file to be built up from account level balances. For this purpose, branches should prepare control cards for each account and carbon copies of control cards and monthly jotting sheets of account level balances should be sent to zonal/regional offices for further processing on their micro-processor systems. (Paras 5.6 to 5.10).

9. Classificatory codes and nomenclatures of different types of transactions may be standardised and made uniform for all the returns. Frequent changes in the forms and classificatory items should be avoided. (Para 5.8)

10. To facilitate speedy clearance of cheques, service branches should be established by banks in centres where they have more than ten branches. (Para 6.11)

11. Information system on foreign exchange transactions in large branches should be supported under model II of mechanisation. In such large branches, the microprocessor based system which will be installed to support domestic business should also be used to process foreign exchange transactions. (Para 7.16)

12. The dealing room transactions should be supported by a separate computer system working in real time environment, with a capability of being connected to the systems in other dealing rooms. (Para 7.17)

13. It would be appropriate to allow major banks in India to import computer systems with software packages for their foreign exchange transactions, if needed. (Para 7.20)

14. The computer systems in head offices of banks should be mainframe systems with on-line inquiry terminals. Smaller banks could go in for microprocessor systems with sufficiently large capacity. Banks should computerise processing of statutory and other statistical returns, reconciliation of inter-branch transactions, cash and investment management, pay rolls, provident fund accounting and personnel inventory data. They should maintain time series data on financial, monetary and economic variables. (Paras 8.5 to 8.13)

15. It is necessary to equip zonal/regional offices with microprocessor based systems and off-line data entry machines. They should transcribe data received from branches on computer media and edit and reformat them wherever necessary and transmit the same to their head offices.

zonal/regional offices should also process these data for their own control purposes. (Para 8.14)

16. Input-output formats should be standardised. A glossary of terms/items in various books of accounts should be prepared and standardised with uniform code designs. Input forms may be designed as far as possible, with pre-printed codes, to avoid extra effort of coding the forms. Reserve Bank should examine all the coding systems in different returns with a view to standardising them. (Paras 8.17 and 8.18)

17. Even under mechanised systems, the existing procedures of data transmission through different tiers of banks should continue. (Para 8.22)

18. The programme of mechanisation should be implemented in five years, in two stages. Stage I will cover the three year period 1985 to 1987 and stage II will cover the remaining two years, 1988 and 1989. A detailed review of the programme should be undertaken at the end of stage I. (Para 9.4)

19. In the first stage, installation of mainframe systems in head offices, microprocessor systems in zonal/regional offices covering about 200 branches should be completed. The mainframe system should have one megabyte real memory, 200-400 megabytes of disc storage supported by two floppy disc drives, three tape drives, two line printers and a few on-line inquiry terminals. The system may also have a card reader, if necessary. The microprocessor system should have one megabyte of real memory, 80 megabytes of disc storage with one or two floppy disc drives, one or two tape units, one line printer and eight off-line data entry terminals. There could be some variations in these configurations depending on the size of the bank. The systems should have upgradation potentiality. (Paras 9.5 and 9.6).

20. Under branch level mechanisation, branches having an average workload of about 1,000 vouchers per day should be equipped with electronic ledger posting machines with attached memory modules or microprocessor based system. This need not preclude branches having a workload of less than 1,000 vouchers per day to implement either of these models, if it is found desirable from the point of view of customer services. It is estimated that stage I will cover about 2,500 branches In stage II, additional 6,000 branches will be covered. (Paras 9.7 and 9.8)

21. While it is desirable that the programme of mechanisation in the three tiers is implemented as a package, the installation of mainframe systems and microprocessors in higher tiers need not be held up till branch level mechanisation is completed. (Para 9.7)

22. In stage I, the industry would need about 10,000 electronic ledger posting machines with memory modules, 200 microprocessor based systems and 25 mainframe systems. The investment in hardware would be about Rs. 135 crores. (Para 9.10)

23. Banking Industry will need about 40,000-45,000 operators and 1,000 systems analysts and programmers. These personnel requirements will largely be met from the existing staff. Training of operators and programmers may be arranged by banks. Training of systems

analysts should be designed and conducted by the National Institute of Bank Management. (Paras 9.12 to 9.14)

24. Banks may examine whether a separate cadre of EDP personnel should be created within banks. (Para 9.15)

25. Banks may create immediately EDP Cells in their organisations and initiate advance actions. (Para 9.20)

26. The Indian Banks' Association should take the overall responsibility of planning, coordinating and implementing the programme of mechanisation. It should be supported in this endeavour by Government agencies and other apex level institutions. (Para 9.22)

27. A Standing Committee under the chairmanship of a Deputy Governor of the Reserve Bank of India should be set up by the Reserve Bank to monitor the implementation of the programme of mechanisation. The Committee should have members drawn from Department of Electronics, Ministry of Finance and the Indian Banks' Association, among others. (Para 9.23)

28. The requirements of branch level mechanisation should be met indigenously. In the context of large scale requirements of equipments, it is necessary to create sufficient manufacturing capacity and also allow import of know-how and electronic parts as are needed. The Department of Electronics should plan and coordinate the activities of manufacturers of these equipments. (Para 9.24)