

IX.1 The payment and settlement system, by providing a fast, efficient and secure basis for financial transactions, forms the bedrock of the financial system. Information Technology (IT) has become the single largest facilitating force behind the successful transformation of transactions and analytical processing of banking business. The convergence of paper and electronic modes of payment, improvement in operational efficiency and flexibility through adoption of IT intensive processes and innovations in the nature of new delivery channels have significantly changed the financial landscape of the Indian banking sector. During 2007-08, the Reserve Bank continued to exercise its oversight for facilitating a secure, efficient and sound payment and settlement systems. The Reserve Bank put in place a robust IT system for itself besides charting out the IT Vision Document for the banking system.

IX.2 This Chapter highlights the role played by the Reserve Bank, through intensive consultations, in modernising the payment and settlement systems, and increasing IT intensity of the banking system. It covers the measures being initiated to operationalise the Payment and Settlement Systems Act, 2007 which provides a well founded legal basis for payment systems. Several important policy directions issued by the Board for Regulation and Supervision of Payment and Settlement Systems (BPSS) relating to legal, risk mitigation and customer service are also covered. Various indicators of the payment system point towards a sharp increase in both volumes and values put through systemically important payment system (SIPS) and retail payment system, especially through the electronic clearing instruments, *viz.*, real time gross settlement (RTGS), forex and Government securities clearing and retail electronic fund transfer (EFT) and card based payments within retail payment system. The Reserve Bank initiated measures in various areas such as RTGS and centralised funds management system (CFMS) facilities, reduction in cost for electronic transactions, framework for

electronic benefit transfer and Indo-Nepal remittances scheme. Setting up of data centres and successful migration of many of its systems to the new centres, which would not only enable consolidation of systems and centralised data processing but also business continuity and disaster recovery, was the major highlight of the IT implementation in the Reserve Bank during 2007-08. Implementation of the integrated accounting system (IAS), operationalisation of the centralised public accounts system (CPADS), implementation of the integrated computerised currency operations and management system (ICCOMS), migration to multi-protocol label switching (MPLS) of Indian financial network (INFINET) and migration of its corporate mail to a centralised system were the other major developments in the area of IT implementation within the Reserve Bank. In order to delineate the broad approaches being followed by the Reserve Bank so as to enable banks to plan their IT initiatives suitably, the latest version of the Financial Sector Technology (FST) Vision document for the period 2008-2010 was also released.

### **PAYMENT AND SETTLEMENT SYSTEMS**

#### **Board for Regulation and Supervision of Payment and Settlement Systems (BPSS)**

IX.3 The Payment and Settlement Systems Act, 2007 was notified in the Official Gazette of the Government of India on December 20, 2007. The Act provides for a well founded legal basis for payment systems, an important element of compliance with the Core Principles for Systemically Important Payment Systems. The Board for Regulation and Supervision of Payment and Settlement Systems Regulations (BPSS), 2008 and the Payment and Settlement Systems Regulations, 2008 were notified on August 12, 2008. The BPSS Regulations cover: (i) composition of the Board; (ii) functions and powers of the Board; (iii) powers to be exercised on behalf of the Board; and (iv) constitution of sub-committees. The Payment and

Settlement Systems Regulations cover the following: (i) authorisation of payment systems including submission of application for authorisation for commencing or carrying on a payment systems, grant of authorisation certificates, certificate format, etc.; (ii) payment instructions and determination of standards; (iii) furnishing of returns, documents and other information; (iv) furnishing of audited balance sheets, etc.

IX.4 The Board for Regulation and Supervision of Payment and Settlement Systems (BPSS), met on five occasions during July 2007 to June 2008. The thrust of the Board's directions was on issues relating to legal, risk mitigation and customer service in payment and settlement systems. The Board provided direction on several important areas, which, *inter alia*, included (i) preparation of a framework for payments through mobile phones; (ii) extension of jurisdiction of the magnetic ink character recognition (MICR) clearing houses; (iii) computerisation of non-MICR clearing houses; (iv) conducting a survey to ascertain whether extension of RTGS business hours (by half an hour) actually met the customers' needs; (v) expanding national electronic funds transfer (NEFT) system to make all RTGS branches NEFT enabled; (vi) disseminating information on major payment services offered by banks covering the range of service charges and quantum of compensation to be paid by banks for deficiency in these services; (vii) exploring the feasibility of developing a domestic card to inject competition in the market in a non-discriminatory manner; (viii) releasing the Report on Oversight of Payment Systems in India; (ix) preparing a technical paper on the expansion of city jurisdiction for clearing purposes and exploring the scope of 'cluster' approach; (x) initiating a dialogue for bringing the post offices into the fold of the retail electronic payment system; (xi) upgrading the NEFT system into a 24x7 type remittance system; (xii) launching the Indo-Nepal remittance system; (xiii) rationalising customer charges for use of ATMs for cash withdrawal and balance enquiry with an aim to enhance transparency in service charges and facilitate optimum use of

ATMs; and (xiv) making mandatory use of electronic mode of payment for large value transactions (initially Rs.1 crore and above, later Rs.10 lakh and above) between the Reserve Bank regulated entities and markets.

IX.5 Following the directions of the Board, the consolidated information on service charges is available on the Reserve Bank's website with links provided to the websites of the respective banks. The regulatory circulars on customer charges for use of ATMs as also the mandatory use of electronic mode of payment for transaction of Rs.1 crore and above (Rs.10 lakh from August 1, 2008) between the Reserve Bank regulated entities and markets were issued and implemented by banks. Draft guidelines on mobile payments were also placed on the website.

#### **DEVELOPMENTS IN PAYMENT AND SETTLEMENT SYSTEMS**

IX.6 The value of annual turnover through various channels of the payment and settlement systems during 2007-08 increased sharply by 41.8 per cent as compared with 37.5 per cent during the previous year. As a result, the ratio of annual turnover to GDP, increased to 12.7 in 2007-08 from 10.2 in 2006-07 and 8.6 in 2005-06. Growth in the turnover during 2007-08 was led by the systemically important payment systems (SIPS) transactions and the settlement of financial market clearing which continued to witness a robust growth during the year. The share of these two types of transactions in total transactions increased to 85.1 per cent during 2007-08 from 82.9 per cent during 2006-07. The electronic clearing was led by RTGS clearing followed by forex clearing and government securities clearing. However, paper-based transactions remained significant both for SIPS and retail payment system in terms of the volume of clearing undertaken through these modes. The turnover of the RTGS system increased sharply by 47.8 per cent during 2007-08 on top of 60.1 per cent growth witnessed during 2006-07 (Table 9.1).

Table 9.1: Payment System Indicators – Annual Turnover

Item	Volume (000s)				Value (Rupees crore)			
	2004-05	2005-06	2006-07	2007-08	2004-05	2005-06	2006-07	2007-08
1	2	3	4	5	6	7	8	9
<b>Systemically Important Payment Systems (SIPS)</b>								
1. Inter-bank Clearing	808	*	*	*	9,91,436	*	*	*
2. High Value Clearing	13,077	15,924	18,730	21,919	46,07,208	49,81,428	50,34,007	55,00,018
3. RTGS	460	1,767	3,876	5,840	40,66,184	1,15,40,836	1,84,81,155	2,73,18,330
<b>Total SIPS (1 to 3)</b>	<b>14,345</b>	<b>17,691</b>	<b>22,606</b>	<b>27,759</b>	<b>96,64,828</b>	<b>1,65,22,264</b>	<b>2,35,15,162</b>	<b>3,28,18,348</b>
					(3.1)	(4.6)	(5.7)	(7.0)
<b>Financial Markets Clearing</b>								
4. Government Securities Clearing	185	151	167	216	26,92,129	25,59,260	35,78,037	56,02,602
5. Forex Clearing	466	490	606	757	40,42,435	52,39,674	80,23,078	1,27,26,832
<b>Total Financial Markets Clearing (4+5)</b>	<b>651</b>	<b>641</b>	<b>773</b>	<b>973</b>	<b>67,34,564</b>	<b>77,98,934</b>	<b>1,16,01,115</b>	<b>1,83,29,434</b>
					(2.1)	(2.2)	(2.8)	(3.9)
<b>Others</b>								
6. MICR Clearing	927,571	1,015,912	1,125,373	1,201,045	37,57,608	44,92,943	54,01,429	60,28,672
7. Non-MICR Clearing	225,392	254,922	223,177	237,600	11,02,643	18,54,763	16,06,990	18,67,376
8. Retail Electronic Clearing	57,900	83,241	148,997	218,800	77,702	1,06,598	1,86,160	9,71,486
9. Cards	171,004	201,772	229,713	316,509	31,047	39,783	49,533	70,506
<b>Total Others (6 to 9)</b>	<b>1,381,867</b>	<b>1,555,847</b>	<b>1,727,260</b>	<b>1,973,954</b>	<b>49,69,000</b>	<b>64,94,087</b>	<b>72,44,112</b>	<b>89,38,039</b>
					(1.6)	(1.8)	(1.7)	(1.9)
<b>Grand Total</b>	<b>1,396,863</b>	<b>1,574,179</b>	<b>1,750,639</b>	<b>2,002,686</b>	<b>2,13,68,392</b>	<b>3,08,15,285</b>	<b>4,23,60,389</b>	<b>6,00,85,821</b>
					(6.8)	(8.6)	(10.2)	(12.7)
* : Paper-based inter-bank clearing was closed at Mumbai with effect from November 1, 2004 and was phased out at other centres by June 2005. Inter-bank transactions are now settled through the RTGS system, which became operational on March 26, 2004.								
<b>Note:</b> 1. High value clearing refers to cheques of Rs.1 lakh and above.								
2. Settlement of government securities clearing and forex transactions is through Clearing Corporation of India Ltd.								
3. At end-March 2008, the MICR clearing was available at 60 centres (59 centres a year ago).								
4. Electronic clearings comprise Electronic Clearing Services (ECS), Electronic Funds Transfer (EFT), Special Electronic Funds Transfer (SEFT) (in operation from April 2003 to February 2006) and NEFT (in operation since November 2005).								
5. Cards include credit and debit.								
6. Figures in parentheses are ratios to GDP at current market prices.								

### Retail Payment Systems

IX.7 The retail payment systems include cheque clearing, electronic clearing services and card payments. The turnover of the various retail payment systems combined together increased by 23.4 per cent during 2007-08 from 11.6 per cent in 2006-07 mainly on account of sharp growth in retail electronic funds transfer. Cheques continued to be the predominant mode of retail payment, though the share of retail electronic mode of payment increased during 2007-08.

IX.8 A new MICR cheque processing centre (CPC) was set up at Cuttack during the year, taking the total number of MICR CPCs to 60. MICR cheque clearing constituted 83.7 per cent and 86.1 per cent of the volume and value, respectively, of the paper based clearing during 2007-08. The non-MICR based

clearing and settlement increased by 6.4 per cent and 16.2 per cent in volume and value, respectively. To improve efficiency in the non-MICR centres, computerisation of the clearing houses has been taken up. More than 800 clearing houses have been computerised where the settlement is done electronically, while the instruments still continue to be sorted manually. To further bring in efficiency in paper based clearing, cheque truncation was implemented as a pilot project in the National Capital Region of Delhi.

IX.9 Retail electronic funds transfer system comprises electronic clearing services (ECS), electronic funds transfer (EFT) and national electronic funds transfer (NEFT) systems. The electronic funds transfer increased by more than five times during 2007-08 over the previous year,

reflecting a significant increase across all modes of retail electronic funds transfer systems (Table 9.2). The sharp growth in value of retail transactions *vis-a-vis* their volume growth reflected, *inter alia*, the use of electronic mode, as mandated by the stock exchanges, for refunding the oversubscription amount of IPOs floated by companies. Accordingly, the share of retail electronic funds transfer which remained fairly low in the retail payment system (2.6 per cent during 2006-07), increased sharply to 10.9 per cent during 2007-08. To encourage the use of electronic mode of payments, the Reserve Bank waived the processing charges for all electronic payment systems operated by the Reserve Bank for another year, *i.e.*, till March 2009. Also, the coverage of ECS has been increased and is now available at 70 centres as against 64 centres in the previous year. There has been a growth in the volume and value of transactions put through ECS (both credit and debit) due to increase in both the coverage and awareness about the ease in using this system. The ECS as also NEFT are being preferred for making refunds of subscription to IPOs. The EFT, which was operationalised in 1995, is now permitted only for Government payment. All other electronic retail funds transfer are encouraged through NEFT which is a much more secure payment system. NEFT ensures a wider geographical coverage. Both these factors have contributed to growing volumes being put through NEFT.

IX.10 The use of cards for making retail payments is also one of the preferred modes. This is evident

from the increased volume of transactions through cards – both debit as well as credit (Table 9.3).

IX.11 The spread of automated teller machines (ATMs) across the country (more in the urban area) has increased customer convenience and reduced the need for visiting a branch for cash withdrawal and balance enquiry. The number of ATMs increased to 36,314 at end-June 2008 from 28,704 at end-June 2007. However, the non transparency in service charges levied on customers for cash withdrawals and balance enquiry on use of ATMs discouraged the customers from making optimum use of this facility. The Reserve Bank examined the various issues related to the use of bank's own ATMs as also ATMs of other banks by customers. An Approach paper on 'ATMs of Banks: Fair Pricing and Enhanced Access' was prepared. Based on the feedback received, the Reserve Bank issued regulatory guidelines on customer charges for use of ATMs for cash withdrawal and balance enquiry. The salient features of the guidelines, *inter alia*, include (i) use of own bank's ATMs for any purpose to be free from March 10, 2008; (ii) use of other banks' ATMs for balance enquiries to be free from March 10, 2008; (iii) charges for use of other banks' ATMs not to exceed Rs.20 per withdrawal from April 1, 2008, which will be made free from April 1, 2009.

IX.12 A number of State Governments have introduced social welfare programmes which involve payment to the beneficiaries. Payments are made either through Government offices or through banks or other means like money orders. The Reserve Bank has also undertaken certain initiatives to expand the

**Table 9.2: Retail Electronic Funds Transfer Systems**

Type	Volume (000s)				Value (Rupees crore)			
	2004-05	2005-06	2006-07	2007-08	2004-05	2005-06	2006-07	2007-08
1	2	3	4	5	6	7	8	9
ECS-Credit	40,051 (97.3)	44,216 (10.4)	69,019 (56.1)	78,365 (13.5)	20,180 (97.3)	32,324 (60.2)	83,273 (157.6)	7,82,222 (839.3)
ECS-Debit	15,300 (93.7)	35,958 (135.0)	75,202 (109.1)	127,120 (69.0)	2,921 (29.6)	12,986 (344.6)	25,441 (95.9)	48,937 (92.4)
EFT/NEFT	2,549 (211.2)	3,067 (20.3)	4,776 (55.7)	13,315 (178.8)	54,601 (218.8)	61,288 (12.2)	77,446 (26.4)	1,40,326 (81.2)

**Note :** Figures in parenthesis represent percentage change over previous year.

**Table 9.3: Card-Based Payments**

Type	Volume of transactions (000s)				Value of transactions (Rupees crore)			
	2004-05	2005-06	2006-07	2007-08	2004-05	2005-06	2006-07	2007-08
1	2	3	4	5	6	7	8	9
Credit Cards	129,472 (29.2)	156,086 (20.6)	169,536 (8.6)	228,203 (34.6)	25,686 (45.4)	33,886 (31.9)	41,361 (22.1)	57,958 (40.1)
Debit Cards	41,532 (10.0)	45,686 (10.0)	60,177 (31.7)	88,306 (46.7)	5,361 (10.0)	5,897 (10.0)	8,172 (38.6)	12,521 (53.2)

**Note :** Figures in parenthesis represent percentage change over previous year.

outreach of banking facilities to sectors neglected so far, through its financial inclusion initiatives in the form of permitting banks to engage business correspondents (BCs). Combined with this, the need to channelise through the banking system the financial benefits extended by the Governments, both Central and the States, to the weaker and needy sections of the society, required the identification of

the ultimate beneficiaries. In this regard, a Committee was appointed for analysing the related issues and suggesting an appropriate workable framework for electronic benefit transfer (EBT) system that can be considered for adoption by all the State Governments (Box IX.1).

IX.13 Many countries in the world have identified mobile phones as an important mode for delivery of

#### Box IX.1

#### Report of the Committee for Suggesting a Framework for Electronic Benefit Transfer – Major Recommendations

The underlying theme of the recommendations of the Committee (Chairman: R.B. Barman) was to have a broader methodology to ensure that Government payments reach the ultimate beneficiaries using the banking channels adopting the plan of financial inclusion using BCs and biometric based smart-card technology. The Committee also suggested a framework for monitoring the progress in implementation. The main recommendations of the Committee were as under:

- The Committee examined at length the advantages and disadvantages of three models of electronic benefit transfer (EBT), viz., bank-branch model, bank-led model and non-bank model. It preferred bank-led model over the other two models of disbursement of Government benefits. Such a model can operate in tandem with the strategy of 100 per cent financial inclusion.
- The Committee felt that, although the service area approach has well laid down systems for monitoring and review, and the banks and the State Governments are familiar with the modalities of implementation, in view of the easier implementation and monitoring feasibility of technology-based EBT systems, one-district-one-bank approach may be adopted. The places where one-district-multiple-banks approach was already working satisfactorily, the same may continue. The Government needs to identify the bank in consultation with the Reserve Bank to operationalise one-district-one-bank approach.
- Delivery of Government benefits at the place of habitation of the beneficiary should be the ultimate desirable goal. A two-stage approach be adopted.

Initially, disbursements can be made at *Gram Panchayat* level through the bank or its business correspondents. Subsequently, disbursement can move to individual villages.

- Feasibility of e-governance kiosk operating as business correspondent under the existing guidelines be considered after they are well spread out and become viable entities in rural areas and offer payment services as extended arms of banks under the provisions of the extant guidelines of the Reserve Bank on business correspondents.
- There is a need to employ means of de-duplication system in order to ensure that beneficiaries are uniquely identified and any attempt to impersonate or to receive multiple benefits under the same scheme is prevented.
- Payment information should flow electronically from end to end so that a data base is created for generating various types of reports as required by the State Governments.
- The project of up-scaling the pilot to the entire state of Andhra Pradesh should be completed by December 2008.
- State and District Level Steering Committees be set up for the periodic monitoring of the implementation of the project. The State Level Committee be headed by the Chief Secretary, Government of Andhra Pradesh and the Principal Secretary, Rural Development would be the Convenor. The District Level Steering Committee be coordinated by the bank that has been allotted the district for EBT implementation.

banking services. The rapid expansion of this mode of communication has provided impetus for achieving the objective of financial inclusion. However, the technology is still evolving and security issues are being addressed. Nevertheless, this channel has provided the means of communication to a major proportion of the population in the remote areas. The reach of mobile phones in India has also been increasing at a very rapid pace. There were about 265 million mobile phone connections in the country as on March 31, 2008 and about eight million new connections are being added every month. In order to ensure a level playing field and considering that the technology is new, the Reserve Bank has placed draft guidelines, setting out indicative standards to ensure safety, security and integrity of transactions, on its website for public comments.

#### *Real Time Gross Settlement (RTGS) System*

IX.14 The RTGS system, which has been in operation since March 2004 for facilitating faster settlement of high value transactions, has stabilised with increased branch network and wider geographical coverage. The RTGS connectivity was extended to 47,608 branches at end-June 2008 facilitating sharp increase in volumes settled through this system. The volume and value of transactions

through the RTGS system, both in the inter-bank and customer segment, increased sharply, particularly during the last quarter of 2007-08 (Table 9.4). The integration of the RTGS system with the Reserve Banks' internal accounting system (IAS) has enabled straight through processing (STP). Also, with the integration of the RTGS-IAS and the securities settlement system (SSS), automatic intra-day liquidity (IDL) is available. The clearing and settlement operations at NCC, Mumbai and CCIL operated systems are settled in the RTGS as multilateral net settlement batch (MNSB) mode.

#### *Centralised Funds Management System (CFMS)*

IX.15 The CFMS enables banks holding current account with the Reserve Bank to view their balances at all the Reserve Bank offices [through centralised funds enquiry system (CFES)] and transfer funds between the Reserve Bank offices [through centralised funds transfer system (CFTS)]. This facility is now available at all the Reserve Bank centres. At present, 71 member banks are making use of this facility extensively.

#### **Indo-Nepal Remittances**

IX.16 Considering the importance of establishing a formal remittance system between India and Nepal,

**Table 9.4: RTGS Transactions**

Year/ Month (end-March)	No. of Participants	No. of Branches	Inter-bank		Customer		Total	
			Volume	Value	Volume	Value	Volume (4+6)	Value (5+7)
1	2	3	4	5	6	7	8	9
<b>2004-05</b>	<b>N.A.</b>	<b>N.A.</b>	<b>391,931</b>	<b>38,16,522</b>	<b>68,492</b>	<b>2,49,662</b>	<b>460,423</b>	<b>40,66,184</b>
<b>2005-06</b>	<b>N.A.</b>	<b>N.A.</b>	<b>1,053,940</b>	<b>89,70,624</b>	<b>713,058</b>	<b>25,70,212</b>	<b>1,766,998</b>	<b>1,15,40,836</b>
<b>2006-07</b>	<b>106</b>	<b>28,697</b>	<b>1,393,728</b>	<b>1,13,13,347</b>	<b>2,481,779</b>	<b>71,67,808</b>	<b>3,875,507</b>	<b>1,84,81,155</b>
<b>2007-08</b>	<b>101</b>	<b>43,512</b>	<b>1,693,986</b>	<b>1,12,18,157</b>	<b>4,146,041</b>	<b>1,61,00,173</b>	<b>5,840,027</b>	<b>2,73,18,330</b>
April, 2007	105	29,000	122,776	11,09,958	205,699	8,37,607	328,475	19,47,565
May, 2007	105	29,850	131,529	8,75,831	236,852	9,33,090	368,381	18,08,921
June, 2007	100	30,795	131,482	8,16,060	248,997	12,50,114	380,479	20,66,174
July, 2007	100	31,840	131,358	8,40,713	263,319	13,83,382	394,677	22,24,096
August, 2007	100	32,768	137,414	9,83,549	280,917	11,88,034	418,331	21,71,582
September, 2007	100	33,578	127,097	9,10,182	277,955	12,09,225	405,052	21,19,407
October, 2007	99	34,485	141,349	8,46,505	340,576	13,07,703	481,925	21,54,208
November, 2007	100	35,685	146,727	8,87,495	375,960	13,94,946	522,687	22,82,441
December, 2007	100	36,677	145,098	7,91,095	408,181	14,14,048	553,279	22,05,144
January, 2008	100	38,926	159,111	11,88,764	475,241	17,46,045	634,352	29,34,809
February, 2008	102	41,760	156,135	9,89,587	481,218	16,37,191	637,353	26,26,778
March, 2008	105	43,512	163,910	9,78,417	551,126	17,98,788	715,036	27,77,205

N.A.: Not available.

a Committee (Chairman: Dr. R.B. Barman) was set-up. The Committee indicated the urgency of setting up a system, and suggested two alternative models – central bank model and commercial bank model. After examining the pros and cons of both the models, it was suggested that the central bank model involving the Reserve Bank and Nepal Rastra Bank is desirable. But in view of the fact that the Nepal Rastra Bank would take some time to get its infrastructure ready, it was suggested that the system may commence using commercial bank model. Accordingly, the system has commenced operations with effect from May 15, 2008 (Box IX.2).

### Oversight of the Payments and Settlement Systems

IX.17 The Payment and Settlement Systems Act, 2007 has been notified empowering the Reserve Bank to regulate and supervise all payment systems in the country. The Reserve Bank, at present, is exercising these functions as the regulator of banks. The Bank has framed the minimum standards for MICR and non-MICR clearing houses. Similarly minimum standards for operations of ECS and NEFT have also been prepared and circulated to clearing houses for adoption.

## INFORMATION TECHNOLOGY

### Information Technology in the Reserve Bank

IX.18 The Reserve Bank increased the use of information technology (IT) for improving efficiency in its day-to-day operations. During 2007-08, the Reserve Bank pursued the objective of setting up data centres, which would not only enable the consolidation of systems and centralised data processing but also take care of business continuity and disaster recovery in the emergency. Accordingly, the Reserve Bank established three state-of-the-art data centres and successfully migrated many of its systems to the new data centres. The data centres were designed to meet the Tier-IV standard of the Uptime Institute<sup>1</sup>, which provides for redundancy of all components. With the establishment of the data centres, the process of migration of systems from the existing distributed set up to the centralised backbone at the data centre has commenced. The secured internet website, the corporate mail messaging system and the document management information system (DMIS) have been migrated to the new set-up, while work is currently under progress in respect of migration of centralised public accounts department system (CPADS), which was made

#### Box IX.2

##### Indo-Nepal Remittance Scheme – Salient Features

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>i) The target group is the migrant workers of Nepalese origin working in India who make remittances at regular intervals to support their families left behind.</li> <li>ii) This facilitates only one way remittances from India to Nepal using the banking system.</li> <li>iii) A ceiling of Indian Rupees (INR) 50,000 is fixed per remittance and a Nepalese migrant worker is allowed to remit maximum of 12 remittances in a year under this Scheme.</li> <li>iv) The remittances from India are denominated in INR, while the beneficiaries would be paid in Nepalese Rupees.</li> <li>v) The remittance facility is extended to both customers as well as non-customers of the banks. Thus, a</li> </ul> | <ul style="list-style-type: none"> <li>Nepalese migrant worker not having bank account at either end or both ends, can also participate in the remittance system. In such cases, the remitter has to produce identification documents like passport/PAN/driving license/telephone bill/certificate of identification issued by employer in India with details and photograph.</li> <li>vi) All NEFT enabled bank branches in India are to participate in this cross border remittance initiative.</li> <li>vii) Remittances will be distributed to the beneficiaries in Nepal through the branches of Nepal State Bank Ltd. and their approved Agents.</li> <li>viii) Since the target group is poor workers from Nepal, a concessional charge structure has been devised.</li> </ul> |
|--|---|

<sup>1</sup> The Uptime Institute is an internationally recognised institution, headquartered at Santa Fe, New Mexico, United States of America, that provides, among other things, standards for classification of data centres. These are termed as Tiers, with Tier IV being the highest level currently available, providing for 99.999 per cent uptime of data centres.

operational at all offices. Other systems are at various stages of migration. Critical payment system applications such as the RTGS and the negotiated dealing system (NDS) migrated to the systems in the data centre and were tested, thus paving the way for state-of-the-art solutions for the banking sector in particular, and the common man at large.

*Technology Implementation within the Reserve Bank*

IX.19 With IT firmly embedded in all the operations of the Reserve Bank, the need for safe and secure IT based systems assumes significance. During 2007-08, specific guidelines on information systems/ security policy, to be followed by all the IT users in the Bank were issued and widely disseminated amongst the staff, users of IT, vendors and other stake holders.

IX.20 The focus of IT services based facilitation for the internal users of the Reserve Bank continued to follow the broad precincts of ushering in a generic architecture for the Reserve Bank as a whole. This included the setting up of IT systems with a centralised approach; providing for common data bases and uniform operating environment and such measures as are aimed at easing of IT based operations within the Reserve Bank. Continuing its thrust towards providing holistic and centralised systems for the use of the various departments in the Bank, the following initiatives were taken during 2007-08.

IX.21 First, the integrated accounting system (IAS), which aims at replacing the existing legacy IT system

in use at the Deposit Accounts Department of the Reserve Bank, was implemented. This system has been thoroughly tested and has been able to meet the operational requirements.

IX.22 Second, the CPADS as a parallel system at all the offices of the Reserve Bank was operationalised; the Centralised Public Debt Office (PDO) is in use for many years now.

IX.23 Third, the Integrated Computerised Currency Operations and Management System (ICCOMS) was implemented which facilitates cash and currency management with a centralised reporting for more than 4,500 currency chests in the country.

IX.24 Fourth, other systems which continued to operate smoothly include the Centralised Data Base Management System (CDBMS), the Data Warehouse of the Reserve Bank; the secured internet website (which provides an internet based access to authorised users); and systems for the regulatory and supervisory departments such as the off-site monitoring system (OSMOS) and centralised OSMOS (COSMOS).

IX.25 In order to provide a clear analysis of the level of IT absorption and use in the Reserve Bank, performance benchmarking in respect of key evaluation parameters is periodically done. In respect of four critical requirement factors, 100 per cent implementation was completed, while in respect of three other parameters, the implementation ranged between 90 and 97 per cent (Table 9.5).

**Table 9.5: Critical IT Implementation Factors in 2007-08**

Critical Requirement Factor	Performance Yardstick	Position at end-March 2007	Position at end-March 2008
1	2	3	4
Standardisation	Across all departments	95 per cent completed; 5 per cent under progress	97 per cent achieved; 3 per cent under progress
Integrated Application Systems	For all functional units	85 per cent completed; 15 per cent under progress	90 per cent achieved; 10 per cent under progress
Server Consolidation	At all locations	90 per cent completed; 10 per cent under progress	95 per cent completed; 5 per cent under progress
Connectivity	Across all offices and all locations	100 per cent completed	100 per cent completed
Productivity Tools	For all critical mainframe applications	100 per cent completed	100 per cent completed
Corporate e-mail	For all users at all locations	100 per cent completed	100 per cent completed
IS Security	For all information systems	95+ per cent completed	100 per cent completed

IX.26 Given the critical role played by IT solutions in day to day operations, it is imperative that they are available at all times. Therefore, to take care of any contingency even during a disaster, business continuity planning (BCP) is in place. Crucial IT based systems, including payment system application systems (such as the RTGS, CFMS, PDO-NDS and SFMS) have been designed in such a way so as to provide for a high level of uninterrupted availability. The conduct of periodical disaster recovery (DR) drills is done regularly involving all participating members.

IX.27 At the heart of all centralised operations using IT is a reliable communications network connecting all the locations of the Reserve Bank as also its constituents. The move to migrate from the closed user group network of the INFINET to the multi protocol label switching (MPLS) gained momentum. All offices of the Reserve Bank were connected using this new technology, which is aimed at providing for efficiency and lower costs without sacrificing the

safety and security levels required for such network based operations.

IX.28 The corporate mail system of the Reserve Bank, which functions in a network based system, functioned satisfactorily. The major development during the year was the migration of the mail messaging system to a centralised system – called the single forest based mail messaging system. The new system, which provides access to authorised users from anywhere even while they are on the move, has stabilised.

IX.29 With IT-based delivery channels having come to stay, the need is to provide for convergence of technology using new delivery channels (Box IX.3).

#### *Reserve Bank and the IDRBT*

IX.30 The Institute for Development and Research in Banking Technology (IDRBT) has been at the heart of providing networking related infrastructure for not only the Reserve Bank but also for the banking sector as a whole. The Institute continued to provide

#### **Box IX.3 Convergence of Technology – New Delivery Channels**

Banks in the recent past have been able to provide services using new delivery channels and improve quality of services using IT-based solutions. Facilities such as internet and mobile banking have become accepted delivery channels that are becoming increasingly popular among the discerning customer. Internet banking, which commenced as a mere 'browse only' facility, today allows for a customer to perform almost all transactions. Similarly, using mobile technology, customers are able to transmit messages which result in fund transfers and debit authorisations, apart from getting to know transaction details for their respective accounts. Mobile telephone alerts on transactions beyond a particular threshold limit, internet based notifications and other phone banking facilities are also made available by banks. All the banks, which have implemented core banking systems, offer these facilities, *albeit* in differing ranges.

The Reserve Bank also provides a host of new channels for its constituents. The first such feature, implemented many years ago, related to the treatment of subsidiary general ledger (SGL) accounts. These accounts, which were treated as attached to the particular office where they were issued, acquired an all India character as far as their servicing was concerned. With the advent of large scale use of internet, customers of the Banking Department (including Government Departments) of the Reserve Bank

can use the internet to get connected to the Reserve Bank's public website and thereafter login securely to access data pertaining to their accounts, and even download this information to their own computer systems so that they could use the data for further processing. On-line tracking of complaints, e-procurement facilities and electronic based communication to the central banks are other service delivery mechanisms already implemented using IT.

Continuing the process of providing newer delivery channels, the plans for the immediate future include the introduction of cheque truncation (where the physical paper cheque does not move; instead its image is used for processing, which results in quicker processing and hence quicker funds realisation, apart from less manual intervention). Besides, the work flow based processing (where the thrust is on less paper for communication and more real time information dissemination), mobile inputs/alerts, web-based access, bulletin boards, *etc.* are being introduced.

At the heart of all these initiatives is the objective of convergence. Convergence is aimed at providing a multitude of technology based solutions, all of which will provide for inter-operability in a seamless manner to the user with a host of options to choose from, depending on his convenience.

INFINET related services with the thrust during the year being on the migration of the network to the multi-protocol label switching (MPLS) – based communication services for the banking sector as a whole. The IDRBT also continued to provide certification authority related functions to the banking sector and the management of the national financial switch (NFS), which facilitates inter-switch connectivity for ATMs.

*Information Systems Audit*

IX.31 Information systems (IS) audit is now a regular activity in the Reserve Bank and covers the entire life cycle relating to the IT systems. Various components such as pre-launch audit, post-implementation studies and regular IS audit follow internationally accepted norms and approaches. The large scale use of IT in day-to-day operations has also added a new dimension to the risks associated with these activities which have necessitated appropriate risk management systems (Box IX.4).

**IT for the Financial Sector**

IX.32 The IT initiatives taken by the Reserve Bank have an impact on the operations of the banks in the country. In order to provide the broad approaches being followed by the Reserve Bank so as to enable banks to plan their IT initiatives suitably, the Reserve Bank outlines its major plans in the form of a Financial Sector Technology (FST) Vision Document for the period 2008-10. The latest version of this document for the period 2008-10 was finalised and published during the year 2007-08 (Box IX.5).

IX.33 As far as banks are concerned, the major development during the year was the large scale adoption of core banking systems (CBS) by almost all the banks, which provides a host of facilities for customers of banks in addition to enhancing the processing structures of the banks as well.

**Box IX.4  
Risk Management in IT Based Operations**

Risk management in an IT based environment is aimed at protecting an organisation so that its mission-critical activities are continued without any interruption, and not merely that its IT assets are protected. The objective of risk management is to ensure optimal security of the IT systems where information is stored, processed, or transmitted so as to enable the management to make well-informed risk management decisions and to facilitate the authorisation (or accrediting) of the IT systems on the basis of the supporting documentation. Risk management is effective if it is integrated at an early stage of an IT project, right from its conception. An example of risk management for a software system as can be incorporated in the software development life cycle (SDLC) is outlined below:

- Phase 1 – Initiation: The need for an IT system is expressed and the purpose and scope of the IT system is documented. Thereafter, identified risks are used to support the development of the system requirements, including security requirements, and a security concept of operations is formalised.
- Phase 2 – Development or acquisition of the software: The IT system is designed, purchased, programmed, developed, or otherwise constructed. The risks identified during this phase can be used to support the security analyses of the IT system that may lead to architecture and design trade-offs during the system development.
- Phase 3 – Implementation: The system security features should be configured, enabled, tested, and verified. The risk management process supports the assessment of the system implementation against its requirements and within its modelled operational environment. Decisions regarding risks identified must be made prior to the system operation.
- Phase 4 – Operations and maintenance: After it commences operations and performs its functions, the system may be modified on an ongoing basis through the addition of hardware and software and by changes in organisational processes, policies, and procedures. Risk management activities are performed for periodic system reauthorisation (or reaccreditation) or whenever major changes are made to an IT system in its operational, production environment (for instance, new system interfaces).
- Phase 5 – Disposal: This phase may involve the disposition of information, hardware and software. Activities may include moving, archiving, discarding, or destroying information and sanitising the hardware and software. Risk management activities are performed for system components that will be disposed of or replaced to ensure that the hardware and software are properly disposed of, that residual data are appropriately handled, and that system migration is conducted in a secure and systematic manner.

**Box IX.5**  
**Financial Sector Technology Vision Document – 2008-10**

The Financial Sector Technology (FST) Vision Document outlines the general directional strategies to be followed by the Reserve Bank, which could stand out as lamp-posts for use by the banking sector as well. The FST Vision Document has the corporate objective as “enabling financial sector to leverage on IT for better customer service, improved housekeeping and overall systemic efficiency”.

After providing a review of the level of achievements of the earlier FST Vision Document, the focus is on the thrust areas for the medium term of about three years. Recognising that IT would continue to be an integral part of financial operations and the core banking systems would have stabilised well across all banks, the major points of action would be the following:

- integration of core banking systems with common inter-bank payment systems such as NEFT and RTGS, in a straight through processing (STP) mode;
- approach towards centralisation in banks to facilitate customer relationship management (CRM) in a large scale and better MIS based decision making for the enterprise as a whole;
- large scale electronification of payment processes;
- providing for adequate business continuity plans, including disaster recovery systems;
- greater importance on IS Audit;
- emphasis on risk management relating to outsourcing;
- IT related requirements for ensuring time bound compliance to the needs for Basel II;
- large scale usage of standardised message based financial transaction processing;
- full scale implementation of core banking in the Reserve Bank as well; and
- periodical review of the achievement of these objectives.

### Outlook

IX.34 The Payment and Settlement Systems Act, 2007 has been notified. The Reserve Bank has been vested with the powers to regulate and oversee the payment and settlement systems in the country, including those operated by entities not regulated by the Reserve Bank. The Reserve Bank would endeavour to ensure smooth operations of the existing payment systems while implementing the Act. The focus would be on authorising payment systems that should continue to operate. Desirous system providers would be analysed based on the need of the payment system(s) as also the capability of the provider. The setting up of the National Payments Council of India (NPCI) for retail operations and improving efficiency in the retail payment systems would be a priority. For ensuring smooth operations, greater focus would be placed on oversight of the payment and settlement systems. Widening of the

RTGS network to cover more branches and prescription of mandatory electronic clearing of the high value transactions (March 2008) are likely to increase the RTGS turnover significantly in the coming years.

IX.35 The operations of the Reserve Bank have become increasingly IT intensive in recent times. With the data centres becoming fully operational, the respective business departments would be able to channel their efforts towards their core functional areas, while the IT related aspects will be taken care of by officials of the data centres. The objective is to ensure that IT is available for use by the functional units of the Reserve Bank as a tool to help them achieve operational excellence. Efforts are afoot to ensure that all processing requirement capabilities are taken care of from an IT perspective, resulting in a synergistic, well-bound and integrated relationship between IT and operations.