

# IX

## PAYMENT AND SETTLEMENT SYSTEMS AND INFORMATION TECHNOLOGY

*Recognising the significance of advances in payment and settlement systems matching the needs of the economy and the financial system, the Reserve Bank works with a clear mission to ensure that all payment and settlement systems operating in the country are "safe, secure, sound, efficient, accessible and authorised". Consistent with the mission, the Reserve Bank took several measures during the year for improving the efficiency of existing systems as well as promoting the use of new modes/systems while also striving to put in place a framework for off-site and on-site surveillance of payment systems. With a view to further leveraging the role of information technology (IT) in enhancing the efficient functioning of the financial system, the Reserve Bank undertook important steps covering IT infrastructure and implementation of new applications.*

IX.1 Payment and Settlement Systems are a vital part of the economic and financial infrastructure and contribute to the overall economic performance and financial stability by facilitating efficient financial intermediation. The Indian financial system is characterised by existence of a variety of payment systems and products reflecting continuation of traditional paper based mode of payments along with a significant growth in a range of diverse electronic modes of payments. The increasing penetration and emergence of new forms of payment and settlement systems makes the supervision and oversight of payment systems a critical function of the Reserve Bank for ensuring the safety of these systems. Apart from performing the regulatory functions and facilitating the development of payment and settlement systems, the Reserve Bank also plays a critical role in harnessing the benefits of advances in information technology (IT), both for the banking sector as a whole and its own operations.

IX.2 The payment and settlement systems in India functioned in a non-disruptive manner during the stress in the global financial markets and thereby did not act as a channel of contagion. Payment and settlement systems functioned smoothly and efficiently in 2009-10 as well ensuring the timely settlement of both systemically important high value transactions and retail transactions of the public at large. This was facilitated by various technological advancements

that were initiated in payment and settlement systems by the Reserve Bank.

### PAYMENT AND SETTLEMENT SYSTEMS

IX.3 Technology induced developments in payment and settlement systems have been significant in recent years and can be analysed under two major categories. The first category relates to adapting the existing payment products for use on new channels brought about by technology. The card schemes with their ubiquitous acceptance network fit into the first category. The adaptation of card based payments over the internet has enabled the use of such products across the globe. The second category relates to new channels of delivery enabled by technology. Internet/mobile based products have become important means of payments. This has also brought in non-bank players into the arena. The role of Reserve Bank as a regulator and facilitator of these developments assumes critical importance, given the pace and complexity of changes as well as the risks involved.

### Regulatory and Developmental Role of the Reserve Bank in Payment and Settlement Systems

IX.4 In terms of the Payment and Settlement Systems Act (the PSS Act), 2007, the Reserve Bank has been vested with statutory powers to regulate and supervise the payment systems in the country.

Under the PSS Act, the Bank has constituted an apex body, the Board for Regulation and Supervision of Payment and Settlement Systems (BPSS). The Department of Payment and Settlement Systems (DPSS) of the Reserve Bank assists the BPSS in administering various provisions of the PSS Act.

IX.5 The PSS Act enjoins upon any entity the need to obtain authorisation from the Bank (unless specifically exempted in terms of the PSS Act) for operating any payment system as defined therein. By the end of June 2010, authorisation has been granted to 37 payment system operators of pre-paid payment instruments, card schemes, cross border inward money transfers, Automated Teller Machine (ATM) networks and centralised clearing arrangements. The details of authorised entities are available on the Reserve Bank's website ([www.rbi.org.in](http://www.rbi.org.in)). All payment system operators

have been advised to comply with the relevant Anti Money Laundering (AML) standards and Combating Financing of Terrorism (CFT) guidelines issued by the Bank.

### Developments in Payment and Settlement Systems

IX.6 The total turnover under various payment and settlement systems registered a growth of 15.6 per cent in terms of value during 2009-10, as compared with 13.3 per cent during 2008-09 (Table IX.1). The annual turnover in payment systems has been increasing as a ratio of GDP which is consistent with the financial deepening of the economy.

#### *Paper-based Payment Systems:*

IX.7 The paper-based systems still continue to dominate in terms of volume, and therefore are

**Table IX.1 : Payment System Indicators - Annual Turnover**

Item	Volume (000s)			Value (Rupees crore)		
	2007-08	2008-09	2009-10	2007-08	2008-09	2009-10
1	2	3	4	5	6	7
<b>Systemically Important Payment Systems (SIPS)</b>						
1. High Value Clearing	21,919	21,848	5,525	55,00,018	45,50,667	18,61,560
2. RTGS	5,840	13,366	33,241	2,73,18,330	3,22,79,881	3,94,53,359
<b>Total SIPS (1+2)</b>	<b>27,759</b>	<b>35,214</b>	<b>38,766</b>	<b>3,28,18,348</b>	<b>3,68,30,548</b>	<b>4,13,14,919</b>
				<b>(6.6)</b>	<b>(6.6)</b>	<b>(6.6)</b>
<b>Financial Markets Clearing</b>						
3. CBLO	113	119	142	81,10,829	88,24,784	1,55,41,378
4. Government Securities Clearing	216	270	346	56,02,602	62,54,519	89,86,718
5. Forex Clearing.	757	838	884	1,27,26,832	1,69,37,489	1,42,11,486
<b>Total Financial Markets Clearing (3 to 5)</b>	<b>1,086</b>	<b>1,227</b>	<b>1,372</b>	<b>2,64,40,263</b>	<b>3,20,16,792</b>	<b>3,87,39,582</b>
				<b>(5.3)</b>	<b>(5.7)</b>	<b>(6.2)</b>
<b>Others</b>						
6. MICR Clearing	12,01,045	11,40,492	11,43,164	60,28,672	58,49,642	66,64,003
7. Non-MICR Clearing	2,37,600	2,33,566	2,30,567	18,67,376	20,60,893	18,78,425
<b>Retail Electronic Clearing</b>						
8. ECS DR	1,27,120	1,60,055	1,50,214	48,937	66,976	69,819
9. ECS CR	78,365	88,394	98,550	7,82,222	97,487	1,17,833
10. EFT/NEFT	13,315	32,161	66,357	1,40,326	2,51,956	4,11,088
<b>Total Retail Electronic Clearing Cards</b>	<b>2,18,800</b>	<b>2,80,610</b>	<b>3,15,121</b>	<b>9,71,485</b>	<b>4,16,419</b>	<b>5,98,740</b>
11. Credit Cards	2,28,208	2,59,561	2,34,209	57,985	65,356	62,950
12. Debit Cards	88,306	1,27,654	1,70,170	12,521	18,547	26,566
<b>Total Others (6 to 12)</b>	<b>19,73,954</b>	<b>20,41,883</b>	<b>20,93,231</b>	<b>89,38,039</b>	<b>84,10,857</b>	<b>92,30,684</b>
				<b>(1.8)</b>	<b>(1.5)</b>	<b>(1.5)</b>
<b>Grand Total (1 to 12)</b>	<b>20,02,799</b>	<b>20,78,324</b>	<b>21,33,369</b>	<b>6,81,96,650</b>	<b>7,72,58,197</b>	<b>8,92,85,185</b>
				<b>(13.8)</b>	<b>(13.9)</b>	<b>(14.3)</b>

**Notes:** 1. High value clearing refers to cheques of ₹1 lakh/10 lakh. The clearing has been discontinued with effect from April 1, 2010.  
2. Settlement of government securities clearing, CBLO and forex transactions is through Clearing Corporation of India Ltd.  
3. At the end of April 2010, the MICR clearing was available at 66 centres (65 centres during previous year).  
4. The figures relates to Cards are for transactions at POS Terminals only.  
5. Figures in parentheses are ratios to GDP at current market prices.  
6. Retail Electronic Clearing for 2007-08 (Volume and Value) includes refund of the oversubscription amount of IPOs floated by companies using electronic mode by the stock exchanges as mandated.

categorised as a System-Wide Important Payment System (SWIPS). Its share has, however, been declining both in volume and value terms in recent years (Chart IX.1). To streamline the process and reduce the time taken for collection of outstation cheques, the concept of Speed Clearing (introduced in 2008, leveraging on the core banking infrastructure of banks) has now been made available as part of Magnetic Ink Character Recognition (MICR) clearing at all the 66 MICR Cheque Processing Centres (CPCs). This has reduced the time taken for realisation of proceeds of outstation cheques to T+2/ 3 days. As a consequence, the separate inter-city clearing run by Reserve Bank was discontinued from November 2009.

IX.8 To ensure further efficiency as also to reduce physical movement of cheques, the Cheque Truncation System (CTS) that involves use of images for processing of cheques in clearing was introduced in the National Capital Region (NCR) of Delhi in 2008. With complete migration of cheque volume to CTS, the MICR processing has been discontinued in the NCR. The CTS system now handles around 12 per cent of the total cheque volume in the country. In a bid to extend the benefit of CTS to other parts of the country, the process of roll-out of CTS at Chennai has been initiated. A grid-based approach is being envisaged as part of the roll-out process whereby all the centres in a region can reap the benefits of CTS by joining the arrangements.

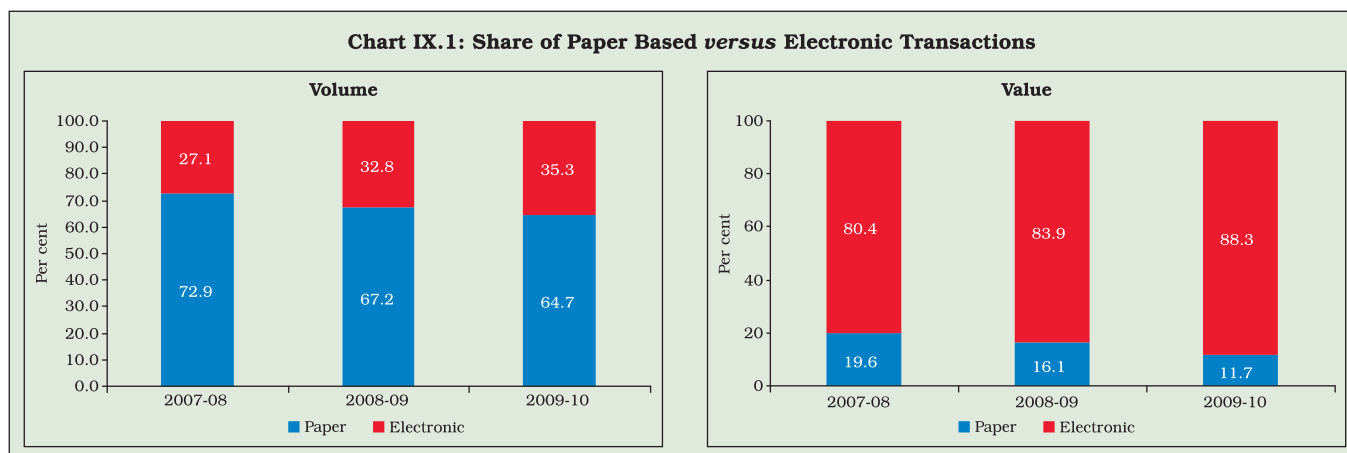
IX.9 After a comprehensive review and discussions with stakeholders, a new cheque

standard styled 'CTS-2010 Standard' prescribing mandatory and desirable security features on cheque forms/leafs has been proposed, which would further increase the comfort of banks while using images for presenting and processing (Box IX.1). This is expected to be implemented in a phased manner starting early 2011.

IX.10 Considering the inherent risks involved and as an important step towards encouraging transition to alternate efficient electronic payment systems viz. RTGS, NEFT, the Reserve Bank discontinued the separate High Value Clearing (HVC) (*i.e.*, same day clearing of local cheques of ₹1 lakh and above), that was operational at 30 large centres across the country, in a non-disruptive manner. Cheques of higher value can, however, continue to be presented in the normal MICR clearing.

#### Electronic Payment Systems

IX.11 The Reserve Bank has been, over a period of time, proactively encouraging the introduction of electronic payment products that are superior to paper-based systems in terms of traceability, efficiency, speed and safety. These include large value payment options like the Real Time Gross Settlement (RTGS) as also retail payment options that facilitate multiple credit/debit transactions (Electronic Clearing Service (ECS) - credit/debit) or person to person electronic payments (National Electronic Funds Transfer - NEFT).



### Box IX.1 New Cheque Standard “CTS 2010”

The developments in cheque clearing, such as growing use of multi-city and payable-at-par cheques, introduction of Cheque Truncation System (CTS) for image-based cheque processing, and increasing popularity of Speed Clearing for local processing of outstation cheques have increased complexity in cheque processing which calls for process re-engineering and automation. Such developments along with the diversity in patterns, designs and security features of cheque forms introduced over a period of time have necessitated prescription of certain minimum security features in cheques printed, issued and handled by banks for uniform application across the banking industry. Against this backdrop, a Working Group comprising various stakeholders viz., commercial banks, paper manufacturers and security printers apart from Reserve Bank was set-up by the Bank for examining the need for further standardisation of cheque forms and enhancement of security features therein.

Based on the recommendations of the Working Group and the feedback received from banks, Indian Banks Association (IBA) and National Payments Corporation of India (NPCI) among others, certain benchmarks towards standardisation of cheques have been issued. The benchmarks styled “CTS-2010 standard” contains mandatory and optional security features on cheque forms. The mandatory security features include quality of security paper, “CTS-INDIA” watermark, bank’s logo in invisible ink (UV ink) and void pantograph (an anti-copying feature).

Additionally, certain desirable features have also been suggested, which could be implemented by banks based on their needs and their own risk perception. The new cheque standard mandates placement of significant fields on the cheque forms. It also recommends use of light/pastel colours and clutter free background in cheque forms for improving quality and content of cheque images in CTS scenario. The benchmarks, *inter alia*, include prohibition of alterations/corrections on cheque forms other than for date validation. Use of UV image view in CTS has been kept on hold for the present considering the implementation challenges and will be reviewed in future.

This set of minimum security features would not only ensure uniformity across all cheque forms issued by banks in the country, but also aid presenting/collecting banks while scrutinising/recognising cheques of drawee banks in an image-based processing scenario. The homogeneity in security features is expected to act as a deterrent against cheque frauds, while the standardisation of field placements on cheque forms would enable straight-through-processing by use of optical/image character recognition technology. The “CTS-2010 standard” is proposed to be implemented by banks before the roll-out of CTS at Chennai. IBA and NPCI have been vested with the responsibility to co-ordinate and advise banks on introduction of additional security features on cheques as also other aspects relating to implementation of the new standard across the country.

- a) A new variant of ECS styled National Electronic Clearing Service (NECS) was introduced in September 2008, to overcome the geographical limitations of the coverage of the current ECS, which was available only at 86 major centres, and to enable users to avoid submission of multiple files to different centres. NECS facilitates participation of all Core Banking Solution (CBS) enabled branches of member banks. The processing and settlement of NECS is centralised at Mumbai. As a further refinement, to cater to the need of banks operating at the State/Regional level, Regional ECS (RECS) credit was introduced on a pilot basis in Bangalore in May 2009. RECS operates from a single location in the State (the capital city) and credits are made to beneficiary accounts maintained with core-banking enabled branches across the entire State. This has since been extended to Chennai and is proposed to be operationalised across the country.
- b) The NEFT system has been strengthened by:
  - (i) enhancing Business Continuity Plans/ Disaster Recovery arrangements, ii) mandating creation of Customer Facilitation Centre (CFC) for prompt resolution of customer complaints, (iii) increasing the number of settlements from six to eleven and making the system available from 0900 hours to 1900 hours on weekdays and 0900 hours to 1300 hours on Saturdays and (iv) mandating ‘Positive Confirmation’ to be sent to the originator confirming successful credit to beneficiary’s account. NEFT is presently available across over 69,000 branches in the country.
- c) The scope and coverage of RTGS was expanded by (i) permitting SEBI regulated clearing entities to settle funds leg of OTC

trades of the corporate bond transactions in RTGS, since December 2009, and (ii) extending the cut-off time for processing customer transactions in RTGS at the Reserve Bank up to 1630 hours on weekdays and 1330 hours on Saturdays. Accordingly, the cut-off time for processing inter-bank transactions was extended up to 1800 hours on weekdays and 1500 hours on Saturdays. It is expected that banks would, in turn, correspondingly facilitate longer cut off time to their customers for putting through transactions in RTGS.

IX.12 The RTGS system has been in operation in India since March 2004 and has been exhibiting rapid growth, not only in terms of volume and value of transactions but also in the coverage of branches (Chart IX.2). During the year 2009-10, a total of 11,172 bank branches were added in the RTGS system, thereby increasing the number of RTGS enabled bank branches to 66,178. The efficiency of RTGS system can be judged from the peak volume of RTGS transactions, which touched 248 thousand transactions on March 30, 2010 as compared to the last year's peak level of 128 thousand transactions on March 29, 2009. The increased volumes could be handled smoothly as the Reserve Bank upgraded central systems at Data Centre in December 2009 by implementing architectural changes in the RTGS application.

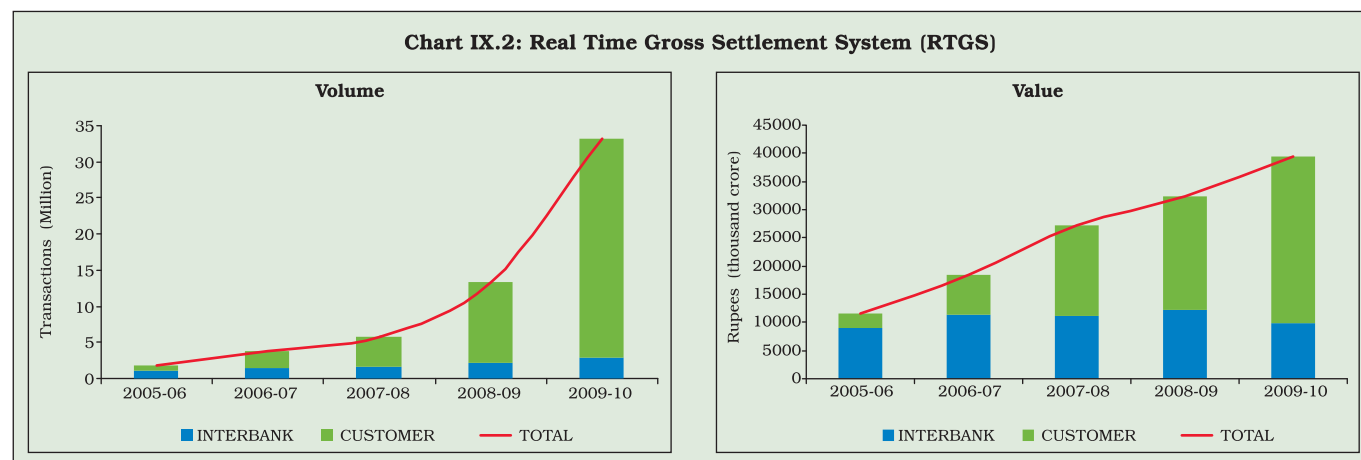
IX.13 Considering the importance of RTGS for settling the large value payments, the Reserve

Bank has initiated steps to revamp the current RTGS system. The proposed system would improve technological and liquidity saving features at par with the similar systems operating elsewhere in the world. A Working Group comprising representatives from the Reserve Bank and major commercial banks has been constituted for preparing the basic approach towards a next generation RTGS system, both from the business and IT perspective.

### Emerging Payment Channels

IX.14 Advances in Information Technology have brought about significant changes in payment channels available across the globe. In India too, while card based payments have been in use for quite some time, more recently, internet/mobile phone based products and the use of these channels for transactions have been gaining momentum and popularity. Further variations of cards like the pre-paid cards also have emerged. The challenge to the Reserve Bank as a regulator posed by such developments is to strike the right balance between encouraging innovations and protecting the integrity and safety of the payment system and upholding the interests of the users. Within this broad framework, the Reserve Bank took several initiatives to encourage the orderly development of these payment channels.

IX.15 To mitigate the risks arising out of the use of credit/debit cards over internet/IVRS (technically referred to as card not present (CNP) transactions),





it was mandated that all CNP transactions should be additionally authenticated based on information not available on the card and an online alert should be sent to the cardholders for such transactions of value for ₹5,000 and above.

IX.16 Pre-paid payment instruments facilitate purchase of goods and services against the value stored on such instruments. To bring in transparency and facilitate orderly growth of this payment product, the Bank issued guidelines in April 2009 and August 2009 on issuance and operations of pre-paid payment instruments. 25 banks and 12 non-banks have so far been accorded approval for issuing pre-paid cards.

IX.17 The operating guidelines for mobile banking issued in October 2008 were relaxed in December 2009, facilitating mobile banking transactions up to ₹50,000, both for e-commerce and money transfer purposes. Banks have also been permitted to provide money transfer facility up to ₹5,000 from a bank account to beneficiaries not having bank accounts with cash payout facility at an ATM or Banking Correspondent. Till June 30, 2010, 40 banks have been granted approval for providing mobile banking facility.

### Customer Service

IX.18 Any efficient payment system has to effectively address the customer service issues relating to ease and cost of access, safety of funds and compensation. The Reserve Bank undertook several important measures in this direction.

- (a) To effectively address the customer service issues arising out of failed ATM transactions where the customer's account gets debited without actual disbursement of cash, the Reserve Bank issued directive to banks in July 2009. The directives re-iterated that the 12 working day time limit be adhered to for re-crediting of such failed transactions and mandating compensation of ₹100 per day for delays beyond the stipulated period. Banks were also advised to submit periodical reports to their Board detailing penalty payments. Furthermore, a standardised template was prescribed for

being displayed at all ATM locations to facilitate lodging of complaints by customers.

- (b) Recognising the fact that the number of Points of Sale (PoS) terminals in the country is over 8 times the number of ATMs and the need for increasing the number of outlets for currency dispensation to enhance customer convenience, the Bank has permitted cash withdrawal up to ₹1,000 using debit cards at PoS terminals. So far, four banks have been accorded permission to introduce this facility.
- (c) The use of electronic/online mode of payments for purchase of goods and services and making payments to public utility companies is becoming increasingly popular. This involves intermediaries like aggregators and payment gateway service providers handling customer funds. To ensure the safety of customer funds involved, guidelines were issued in November 2009, which *inter-alia* prohibit the use of such funds by these intermediaries and require the banks holding these balances to ensure timely onward settlement of funds to public utility companies/merchants.

### International Co-operation/Co-ordination:

IX.19 In July 2009, the Committee on Payment and Settlement Systems (CPSS), constituted under the aegis of the Bank for International Settlements (BIS), expanded its membership and India has been included as one of the members. The CPSS serves as a forum for central banks to monitor and analyse developments in domestic payment, settlement and clearing systems as well as in cross-border and multi-currency settlement schemes. The Reserve Bank is also represented on four Working Groups of CPSS set-up for drawing of standards/guidelines towards efficient functioning of payment and settlement systems and supporting market infrastructures across the world. India is also a member of the SAARC Payments Council. Under the SAARC initiatives, the Reserve Bank has been assisting Royal Monetary Authority (RMA) of Bhutan in setting up the retail electronic payment systems.

## Payment System Vision

IX.20 Following the enactment of the PSS Act, the Reserve Bank with directions from the BPSS has suitably enhanced its Mission statement, “to ensure that all the payment and settlement systems operating in the country are safe, secure, sound, efficient, accessible and authorised”. Towards achieving this Mission, a document for 2009-12 with definite targets has been prepared. The Bank in the short and medium term will endeavour to enhance the security, integrity and resilience of the payment system infrastructure in the country. Towards this, the Bank is in the process of putting in place a framework for off-site and on-site surveillance of payment systems.

IX.21 Remaining challenges include: (i) implementing Cheque Truncation System at National level, (ii) reviewing RECS (Credit and Debit) and integrating with NECS (Credit and Debit), (iii) guiding the expansion of NPCI activities to introduce IndiaCard, POS Switch and Mobile Payments Settlement Network and (iv) developing Next-Gen RTGS.

IX.22 The borderless nature of internet has resulted in payment service providers, authorised in one or few countries, extending their payment services to customers of other countries. These entities, which provide cross border payments, money transfer and stored value accounts facilitate, flow of funds in/out of the country, and also pool the funds due to customers of the country in accounts outside the country, which can militate against legal/regulatory requirements of a country where the capital account is not fully convertible. This also poses challenges in ensuring compliance with the AML/CFT requirements of the country. Furthermore, as most of these arrangements are often unregulated and operated from outside the country, the customers of the country would have no recourse on failure of such entities to deliver their services or winding-up of operations by these entities. The challenge for the Reserve Bank, in such a scenario, is in ensuring that while authorised payment systems/entities are enabled to function smoothly, the unauthorised entities are identified and mitigating measures are taken in a timely manner.

## INFORMATION TECHNOLOGY

IX.23 Information Technology (IT) has helped in increasing the speed and efficiency of banking operations by facilitating the emergence of innovative products and new delivery channels. The role of the Reserve Bank as the driver of technology initiatives in the banking sector assumes greater importance given the challenges posed by rapid advancements in technology. In an environment of fast changing trends and ever increasing demands of users, IT adoption poses several challenges, spanning applications, security, network, vendor management and data management.

IX.24 During 2009-10, the Reserve Bank undertook a number of initiatives in improving IT infrastructure facilities, implementing new applications and initiating steps for further adoption of technology in the financial sector.

### Information Technology Infrastructure

IX.25 As availability of quality IT infrastructure is the prerequisite for adoption of technology in the financial sector, the Reserve Bank has been constantly working towards making significant improvements in the IT infrastructure.

*Data Centres:* The Reserve Bank has set up three data centres for running systemically important payment and settlement system for the financial sector and also its internal applications. All the three data centres are running on a 24X7 basis. Apart from ensuring smooth running of applications (relating to both payment and non-payment systems), the data centres provide enhanced assurance for business continuity. During 2009-10, Disaster Recovery (DR) drills were conducted for payment and settlement system applications as well as non-payment related applications at periodical intervals.

*Networks:* Indian Financial Network (INFINET), a closed user group communication backbone for the Indian financial sector set up by the Institute for Development and Research in Banking Technology (IDRBT), continues to provide secured connectivity for accessing all payment and settlement system applications.

*Secured Internet Website:* This is a single web based interface for connecting banks and government entities with the Reserve Bank over the internet. It provides for secured exchange of information between the Reserve Bank and other external agencies. Among various utilities, this site is being used for Online Returns Filing System (ORFS) by banks, Complaint Tracking System related to Banking Ombudsman scheme, and sharing of MICR/ECS data by banks and clearing houses.

### **Information Technology Applications**

IX.26 IT Applications managed by the Reserve Bank can be classified into three categories: (i) Payment and Settlement System Applications, (ii) Non-payment System Applications and (iii) Applications for internal users of the Reserve Bank. Among Payment and Settlement Systems related applications, Real Time Gross Settlement (RTGS) and Public Debt Office-Negotiated Dealing System (PDO-NDS) are used across the financial sector, whereas Integrated Accounting System (IAS) and Centralised Public Accounts Department System (CPADS) are used by various departments of the Reserve Bank.

#### *Payment and Settlement System Applications*

IX.27 The Government Securities segment has seen some of the new products launched during 2009-10, such as the STRIPS, Interest Rate Futures and Dated Cash Management Bills. The PDO-NDS application was suitably modified to enable smooth operations of the above products.

IX.28 From a decentralised accounting package (BASIS Software) in Regional Offices of the Reserve Bank, there has been a move towards an Integrated Accounting System (IAS), running from data centres which would replace the existing BASIS software in all Deposit Accounts Departments (DAD). For facilitating tele-enquiry, a centralised Interactive Voice Response System (IVRS) has been implemented in data centres, connecting all DADs. The facility is available to all current account holders of the Reserve Bank through a single toll free number. By using this facility, the current account holders can obtain information relating to their account free of cost through telephone or fax.

IX.29 CPADS, a centralised web based application with Public Key Infrastructure (PKI) based security for handling Government transactions has been made live in all the Public Account Departments with effect from September 1, 2009. The application is being upgraded for meeting additional business requirements.

IX.30 Efforts have also been initiated to implement Core Banking Solution (CBS) for the Bank. Once implemented, it is likely to replace the existing disparate accounting systems in the Bank.

#### *Non-payment System Applications*

IX.31 Some of the non-payment system applications having external users, like Database on Indian Economy (DBIE), Integrated Computerised Currency Operations and Management Systems (ICCOMS), Computerised Offsite Monitoring System (COSMOS) have already been migrated to the Data Centre whereas Offsite Monitoring System (OSMOS) and Offsite Surveillance System (OSS) are in the process of migration.

#### *Applications for Internal Users in the Reserve Bank*

IX.32 Applications like Mail Messaging Solution (MMS), Enterprise Knowledge Portal (EKP), Document Management Information System (DMIS), Integrated Establishment System (IES) and Human Resources Management System (HRMS) have been helping in automating internal processes and procedures in the Reserve Bank.

IX.33 The project for total revamping of the existing Local Area Network, which was commissioned in 1999, with the latest available technology has been undertaken. Replacement of the existing proxy servers and domain controllers at all Reserve Bank locations has also commenced.

IX.34 In order to manage the increasing volume of transactions in the payment system applications, steps have been initiated to upgrade the existing mainframe resources. For the purpose, a Technical Advisory Group (TAG) has been constituted with members from various institutions. The group will review the mainframe resources



requirements during the next 3-5 years and submit its recommendations accordingly.

IX.35 As part of regulatory and supervisory functions bestowed on it, the Reserve Bank collects various fixed format data (returns) from commercial banks, financial institutions, authorised dealers and non-banking financial institutions. The Reserve Bank has already put in place an ORFS through which the banks can submit their returns. A Working Group has also been formed to study the existing IT systems in the banks and suggest a suitable approach for implementing automated data flow from these systems to the Reserve Bank. In the process, the banks can improve their internal reporting systems and build effective MIS and decision support systems.

IX.36 With the increased use of IT, there is a need to focus on IT security. As the development and maintenance of applications get increasingly outsourced, issues relating to management and

monitoring of the vendors become a challenge and need to be addressed in a pro-active manner. For the financial system as a whole, ensuring that different agents in the financial system adhere to sound IT Governance Principles assumes critical significance (Box.IX.2). The adoption of IT based solutions has resulted in collection and storage of huge volumes of data in the banking sector and with the increased use of information for decision making at the central bank, there is a need to improve the quality of data submitted by the banks.

### IT Vision

IX.37 A High Level Committee was constituted under the Chairmanship of the Deputy Governor (Dr. K.C. Chakrabarty) and members from IIT, IIM, IDRBT, Banks, and Reserve Bank to prepare the IT Vision for the Reserve Bank for the period 2011-2017 and *inter-alia*, to review the functions of Department of Information Technology and suggest measures for way forward.

### Box IX.2 IT Governance

Information Technology Governance is a subset of corporate governance focused on information technology systems and their performance and risk management. While an effective corporate governance strategy allows an organisation to manage all aspects of its business in order to meet its objectives, IT governance helps to ensure the delivery of the expected benefits of IT in a controlled way and enhance the long term sustainable success of the organisation. The primary goals of IT Governance are to assure that the investments in IT generate business value, and to mitigate the risks that are associated with IT. As IT infrastructure has evolved as the backbone to organisational activities of banks, IT Governance assumes critical significance. Setting up of an efficient IT infrastructure in banks involves enormous investment. Therefore, in terms of its continuous availability and return on investment, it requires basic governance principles to be enunciated.

#### Standard IT governance frameworks

##### ISO/IEC 38500

The world's formal international IT Governance Standard, IS/IEC 38500 was published in June 2008. ISO/IEC 38500 sets out a very straightforward framework for the board's governance of Information and Communications Technology.

##### ITIL® / CobIT® / ISO17799

There are three widely-recognised, vendor-neutral, third party frameworks that are often described as 'IT governance frameworks' viz., ITIL®, CobIT® and ISO17799. While, on their own, they are not completely adequate to that task, each has significant IT governance strengths. ITIL®, or IT Infrastructure Library®, was developed by the UK's Office of Government Commerce as a library of best practice processes for IT service management. Widely adopted around the world, ITIL is supported by ISO/IEC 20000:2005, against which independent certification can be achieved. CobIT®, or Control Objectives for Information and related Technology, was developed by America's IT Governance Institute. CobIT is increasingly accepted as good practice for control over information, IT and related risks. ISO17799, now renumbered as ISO27002 and supported by ISO 27001, (both issued by the International Standards Organisation in Geneva), is the global best practice standard for information security management in organisations.

Without an effective IT governance to deal with these constraints, IT projects will have a higher risk of failure. Each organisation faces its own unique challenges as their individual environmental, political, geographical, economic and social issues differ. Any one of these issues can present obstacles to providing effective governance. Common among such inhibiting factors are poor strategic alignment, lack of project ownership, poor risk management and ineffective resource management.