

The Reserve Bank's continued efforts towards migrating to a less-cash society gained momentum during the year with the introduction of newer digital modes of payment. With the rapid advancement of technology and the advent of new developments and innovations in the payment landscape, the Bank enhanced its focus on the safety and security of the payment systems. Further, the Bank targeted on making technology infrastructure robust to ensure smooth running of the critical and systemically important payment and settlement systems in India.

DEPARTMENT OF PAYMENT AND SETTLEMENT SYSTEMS (DPSS)

IX.1 The push to a less-cash society received an impetus facilitated by quick policy measures and initiatives by the Reserve Bank following the withdrawal of high denomination specified bank notes (SBNs). The initiatives taken by the Bank, along with enhancement in infrastructure and addition of innovative products in the payment space enabled the spread of electronic payments to a larger customer base across the country.

Trend and Progress in Payment Systems

IX.2 The payment and settlement systems continued its robust growth during 2016-17, with volume and value growing at 55.7 per cent and 24.8 per cent, respectively on top of an increase of 49.4 per cent and 9 per cent in 2015-16. The share of electronic transactions moved up to 89.0 per cent in total volume of non-cash payments from 84.4 per cent in the previous year (Table IX.1).

Electronic Payments

IX.3 From amongst electronic modes of payments, Real Time Gross Settlement (RTGS) handled 108 million transactions, valued at around ₹982 trillion in 2016-17, up from 98 million transactions valued at ₹825 trillion in the previous year. At end-March 2017, the RTGS facility was available through 198 banks. During 2016-17, National Electronic Funds Transfer (NEFT)

handled 1.6 billion transactions valued at ₹120 trillion, up from around 1.3 billion transactions for ₹83 trillion in the previous year. At end-March 2017, the NEFT facility was available through 130,013 branches of 172 banks, in addition to business correspondent (BC) outlets.

IX.4 During 2016-17, 1.1 billion transactions, valued at around ₹3.3 trillion and another 2.4 billion transactions, valued at ₹3.3 trillion were carried out through credit cards and debit cards, respectively. Prepaid Payment Instruments (PPIs) recorded around 2.0 billion transactions, valued at ₹838 billion. Mobile banking service witnessed strong growth of 151 per cent and 224 per cent in volume and value terms, respectively while the number of registered customers rose to 163 million at end-March 2017 from 105 million at end-March 2016.

Authorisation of Payment Systems

IX.5 The digital mode of payments was facilitated through 87 authorised payment system operators, as on end-June 2017, comprising PPI issuers, cross-border money transfer service providers, white label ATM (WLA) operators, Trade Receivables Discounting System (TReDS) operators, ATM networks, instant money transfer service providers and card payment networks, besides the Clearing Corporation of India Limited (CCIL) and the National Payments Corporation

Table IX.1: Payment System Indicators – Annual Turnover

Item	Volume (million)			Value (₹ billion)		
	2014-15	2015-16	2016-17	2014-15	2015-16	2016-17
1	2	3	4	5	6	7
Systemically Important Financial Market infrastructures (SIFMIs)						
1. RTGS	92.8	98.3	107.8	754,032	824,578	981,904
Total Financial Markets Clearing (2+3+4)	3.0	3.1	3.7	752,000	807,370	1,056,173
2. CBLO	0.2	0.2	0.2	167,646	178,335	229,528
3. Government Securities Clearing	1.1	1.0	1.5	258,917	269,778	404,389
4. Forex Clearing	1.7	1.9	1.9	325,438	359,257	422,256
Total SIFMIs (1 to 4)	95.8	101.4	111.5	1,506,033	1,631,948	2,038,077
Retail Payments						
Total Paper Clearing (5+6+7)	1,196.5	1,096.4	1,206.7	85,434	81,861	80,958
5. CTS	964.9	958.4	1,111.9	66,770	69,889	74,035
6. MICR Clearing	22.4	0.0	0.0	1,850	0	0
7. Non-MICR Clearing	209.2	138.0	94.8	16,814	11,972	6,923
Total Retail Electronic Clearing (8+9+10+11+12)	1,687.4	3,141.5	4,205.0	65,366	91,408	132,255
8. ECS DR	226.0	224.8	8.8	1,740	1,652	39
9. ECS CR	115.3	39.0	10.1	2,019	1,059	144
10. NEFT	927.5	1,252.9	1,622.1	59,804	83,273	120,040
11. Immediate Payment Service (IMPS)	78.4	220.8	506.7	582	1,622	4,116
12. National Automated Clearing House (NACH)	340.2	1,404.1	2,057.3	1,221	3,802	7,916
Total Card Payments (13+14+15)	1,737.7	2,707.3	5,450.1	3,326	4,483	7,421
13. Credit Cards	615.1	785.7	1,087.1	1,899	2,407	3,284
14. Debit Cards	808.1	1,173.6	2,399.3	1,213	1,589	3,299
15. Prepaid Payment Instruments (PPIs)	314.5	748.0	1,963.7	213	488	838
Total Retail Payments (5 to 15)	4,621.6	6,945.2	10,861.7	154,126	177,752	220,634
Grand Total (1 to 15)	4,717.4	7,046.6	10,973.2	1,660,158	1,809,701	2,258,711

Note: 1. Real Time Gross Settlement (RTGS) system includes customer and inter-bank transactions only.
2. Settlement of Collateralised Borrowing and Lending Obligation (CBLO), Government securities clearing and forex transactions are through the Clearing Corporation of India Ltd. (CCIL). Government Securities includes Outright trades and both legs of Repo transactions.
3. Consequent to total cheque volume migrating to the cheque truncation system (CTS), there is no Magnetic Ink Character Recognition (MICR) Cheque Processing Centre (CPC) location in the country as of now.
4. The figures for cards are for transactions at point of sale (POS) terminals only.
5. The National Automated Clearing House (NACH) system was started by the National Payments Corporation of India (NPCI) on December 29, 2012, to facilitate inter-bank, high volume, electronic transactions which are repetitive and periodic in nature.
6. Figures in the columns might not add up to the total due to rounding off of numbers.

of India (NPCI). The number of non-bank entities authorised for operating PPIs increased to 55 with 18 authorised during 2016-17. While 54 banks were granted approval to issue PPIs, 289 banks

were permitted to provide mobile banking services up to end-June 2017. Eight entities, authorised to operate WLAs, deployed 14,121 WLAs by end-March 2017.

Agenda for 2016-17: Implementation Status

IX.6 In the Payment and Settlement Systems in India: Vision 2018, the department had identified four strategic pillars for achieving its vision. The developments in each of the areas are detailed below.

Responsive Regulation

Framework for Imposition of Penalty

IX.7 Non-adherence to guidelines and standards for payment and settlement systems under the Payment and Settlement Systems (PSS) Act, 2007 can attract penal provisions. The Bank has since notified, under Section 18 of the said Act, a framework for imposition of penalty on authorised payment systems operators / banks to cover offences such as (i) contravention of provisions of the Act, (ii) non-compliance of directions or orders made there under, and (iii) violations of terms and conditions of authorisation.

Review of PPI Guidelines

IX.8 The growing usage of PPIs has led to requests from stakeholders for relaxations in certain areas while strengthening the norms for safety and security, risk mitigation and customer protection. Accordingly, PPI guidelines were comprehensively reviewed and draft Master Directions on issuance and operation of PPIs were placed on the Bank's website on March 20, 2017 for public comments by April 15, 2017. Final circular would be issued in the coming year after examination of the feedback.

Policy Framework for CCPs

IX.9 The Bank has adopted the Principles for Financial Market Infrastructures (PFMIs) for regulation and supervision of FMIs. Accordingly, Central Counterparties (CCPs) being a critical

component should have sound financials, particularly in terms of sufficient shareholders' funds to cover potential business losses in order to continue providing services as a going concern. The Bank is, therefore, in the process of issuing more specific directions on (i) net worth requirement for CCPs, (ii) broad principles underlying governance of CCPs and (iii) more clarity on foreign-regulated CCPs desirous of operating in India.

Payment System Advisory Council (PSAC)

IX.10 PSAC was to be constituted as an advisory body to the Board for Regulation and Supervision of Payment and Settlement Systems (BPSS). Since the Payments Regulatory Board (PRB) is envisaged to replace the BPSS as per the Finance Bill, 2017, no further action is being taken on the formation of PSAC.

Legal Entity Identifier (LEI)

IX.11 The Bank decided to implement the LEI system for all participants in the Over-the-Counter (OTC) markets for Rupee interest rate derivatives, foreign currency derivatives and credit derivatives in India.

Settlement of Funds Leg of Financial Transactions

IX.12 The clearing corporations currently settle funds-leg of trades executed on stock exchanges in accounts with various designated commercial banks which are their clearing banks. The RBI-SEBI Working Group on 'Replacement of Commercial Bank Settlement Model with Central Bank Settlement Model for Securities Market' recommended that funds leg involving commercial banks and clearing corporations could be settled in central bank money. Steps have been undertaken to implement funds settlement of all such securities and commodity market transactions in central bank money.

Robust Infrastructure

Bharat Bill Payments System (BBPS) and Trade Receivables Discounting System (TReDS)

IX.13 In-principle authorisation was granted to NPCI to function as a Bharat Bill Payment Central Unit (BBPCU) of the BBPS, a pan-India inter-operable bill payment system. Up to end-June 2017, a total of 70 entities, both banks and non-banks were granted in-principle approval to operate as Bharat Bill Payment Operating Units (BBPOUs). Pilot operations of BBPS have been launched in August 2016 and 37 billers under the current scope of BBPS related to electricity, gas, telecom, DTH and water are participating. TReDS is an institutional mechanism for facilitating the financing of trade receivables of Micro, Small and Medium Enterprises (MSMEs) from corporate buyers through multiple financiers. All the three entities that had received in-principle approval to set up and operate TReDS have been issued Certificate of Authorisation.

Merchant Discount Rate (MDR)

IX.14 With a view to encouraging a wider segment of merchants to accept card payments, a merchant turnover-based MDR structure for debit card transactions has been proposed in place of the existing slab-rate MDR based on transaction value. Accordingly, a draft circular was placed on the Bank's website on February 16, 2017 for public comments by February 28, 2017. Final circular would be issued in the coming year after examination of the public feedback.

Electronification of Toll Collection

IX.15 Towards electronification of toll collection systems on pan-India basis in an inter-operable environment, in-principle approval was granted to NPCI for setting up and operating a National Electronic Toll Collection (NETC) system. The final approval to NPCI for the NETC project is envisaged to be accorded in the coming year, based on results of the pilot project being undertaken.

Effective Supervision

RTGS Assessment against PFMI

IX.16 The Bank's policy document, "*Regulation and Supervision of FMI regulated by RBI*" states that the Bank would assess/ review the FMIs operated by it against the international standards with the same rigour as other FMIs. Guided by this policy, a detailed assessment of RTGS against the PFMI was carried out during the year.

Other Developments

Measures to Encourage Digitisation

IX.17 Apart from the initiatives already mentioned, the following policy measures were initiated during the year to promote digital transactions in the country:

a. Unified Payments Interface (UPI)

NPCI was given approval to go live for UPI during the year. Further, NPCI was allowed to launch BHIM (Bharat Interface for Money), which is a common app with some functionalities, thus providing an additional interface to customers to connect to UPI besides banks' own apps.

b. National Unified USSD Platform (*99# NUUP Data)

NPCI was permitted to introduce Unstructured Supplementary Service Data (USSD) 2.0 (*99#) version which was also integrated with the UPI, so as to provide a better customer experience for funds transfers.

c. BHIM-Aadhaar Pay Mechanism for Merchant Payments

To provide a channel for customers to make digital payments using their Aadhaar-seeded bank accounts at merchant locations, in-principle approval was accorded to NPCI to launch a pilot on BHIM-Aadhaar Pay. BHIM-Aadhaar Pay is a smart phone-

based application with a dongle attached to it for capture of customer's biometric data. The customer will authenticate the payment transaction by providing biometric identification on the merchant device. These transactions are processed as part of the existing Aadhaar Enabled Payment System (AEPS) with a separate transaction type assigned to them.

d. Inter-operability of ATMs

The Department of Post (DoP) was granted approval for enabling two-way inter-operability of ATMs installed by it with ATMs connected to the National Financial Switch subject to certain conditions such as setting up of a separate vertical within the DoP for handling this work, with subsequent transfer of infrastructure to the India Post Payments Bank (IPPB), and adherence to regulatory instructions of the Bank.

e. Tokenised Contactless Card Payments

Approval was given to the authorised card networks to introduce tokenised contactless card payments such as 'Samsung Pay'.

Publication of Daily Data on Select Electronic Payment Systems

IX.18 With the use of digital payment channels under focus, the Bank started collating daily data of select electronic payment systems, representative data on credit/debit card usage, PPI and mobile banking, and disseminating them on its website on a weekly basis.

Master Directions on Access Criteria for Payment Systems

IX.19 The Bank reviewed the access criteria for payment system and issued a master direction on it taking into account the developments following the earlier instructions issued in September 2011.

Card Not Present Transactions – Rationalisation of Additional Factor of Authentication

IX.20 Customer convenience was enhanced through rationalisation of the mandate for an additional factor of authentication for card not present transactions using network provided solutions for payments up to ₹2,000.

Security and Risk Mitigation Measure - Technical Audit of PPI Issuers

IX.21 Towards enhanced security of the PPIs, following the rapid growth, *post* withdrawal of SBNs, the entities issuing PPIs were advised to carry out a special audit by empaneled auditors of the Indian Computer Emergency Response Team (CERT-In). The audit would cover compliance as per security best practices, change management aspects for the system authorised and adherence to the process flow approved by the Bank.

Bharat QR Code

IX.22 One of the major objectives of the Vision-2018 for the payment and settlement systems in India is to ensure inter-operability among the different service providers of a payment system. Accordingly, all authorised card networks were advised in September 2016 to standardise the QR code, enabling inter-operability of transactions. The inter-operable QR code (Bharat QR) was launched in February 2017.

Financial Market Infrastructure

CPMI-IOSCO Level 3 Assessment

IX.23 The Committee on Payments and Market Infrastructures-International Organisation of Securities Commissions (CPMI-IOSCO) published a report on the financial risk management and recovery practices of ten derivatives CCPs in August 2016, presenting level-3 assessment of consistency in the outcomes of CCPs'

implementation of the PFMI. CCIL was one of the ten CCPs reviewed as part of the level-3 assessment.

CCIL Compliance Audit

IX.24 As a qualified CCP, CCIL is assessed on an on-going basis against PFMI. During the year, a compliance audit of CCIL was carried out to assess its compliance with the observations in the Bank's inspection undertaken in the previous year. As a measure of enhanced transparency, CCIL continued to disclose its self-assessment on its compliance with the PFMI on an annual basis, as per the 'Disclosure Framework and Assessment Methodology', prescribed in the PFMI. CCIL also publishes its quantitative disclosures on a quarterly basis as per the public disclosure standards for CCPs.

Equivalence Recognition of CCIL under EMIR

IX.25 The European Commission has observed that India has regulatory regimes for the CCPs equivalent to the European Union. Consequent to the European Commission's equivalence decision under the European Market Infrastructure Regulation (EMIR), a Memorandum of Understanding (MoU) was executed as part of cooperation between the Reserve Bank and the European Securities and Market Authority (ESMA). The ESMA has included CCIL in its list of recognised CCPs and also advised CCIL as a third country CCP.

Oversight of Payment Systems – Retail

IX.26 During the year, onsite inspection of 13 PPIs and three White Label ATM Operators was carried out.

Special Measures post Withdrawal of SBNs

IX.27 Following the withdrawal of SBNs, several measures were undertaken by the Bank as under:

- a. Towards meeting the currency requirements of the public through ATMs, a Task Force for Recalibration of ATMs was set up under the Chairmanship of Shri S. S. Mundra, Deputy Governor, comprising representatives from the Ministry of Finance, Ministry of Home Affairs, four banks with the largest ATM networks and NPCI. As decided by the Task Force, coordinated efforts of the ATM manufacturers, cash replenishment agencies and service providers were made to recalibrate and replenish the ATMs for dispensing new series of high denomination bank notes. By end-December 2016, with over 1.90 lakh ATMs recalibrated, the Task Force was wound up.
- b. ATM charges for all transactions by savings bank customers were waived for both on-us and off-us transactions from November 10, 2016 till December 30, 2016.
- c. Cash withdrawal limits at POS were enhanced up to ₹2000 per day across all centres (Tier I to VI) and customer charges were waived on all such transactions from November 18, 2016 till December 30, 2016.
- d. The participating banks and PPI issuers of IMPS, UPI and USSD were advised not to levy charges on transactions up to ₹1000 from January 01, 2017 till March 31, 2017.
- e. For debit card transactions during January-March 2017, MDR was capped at 0.25 per cent for transactions up to ₹1000 and 0.5 per cent for transactions above ₹1000 and up to ₹2000. The timeline was subsequently extended till completion of review of the MDR guidelines.
- f. The limit for semi-closed PPIs issued with minimum customer details was enhanced

Box IX.1**Distributed Ledger Technology (DLT)**

The Committee on Payments and Market Infrastructures (CPMI) in February 2017 published a report, “Distributed ledger technology in payment, clearing and settlement - An analytical framework”. The report states that DLT is viewed by many as having the potential to disrupt payment, clearing, settlement and related activities. DLT, including block chain technology, draws upon both well established and newer technologies to operate a set of synchronised ledgers managed by one or more entities. DLT may provide an alternative to the traditional centralisation of database management, as is the case with financial market infrastructures (FMIs).

The report highlights how DLT could enhance efficiency by radically changing the processes of maintaining and storing of assets, how obligations are discharged, contracts are enforced, and risks are managed. The features of DLT could transform financial services and markets by reducing complexity, improving end-to-end processing speed, increasing transparency and improving immutability in transaction record keeping and network resilience, reducing operational and financial risks. This could largely reduce the need for reconciliation across multiple record-keeping infrastructures.

However, DLT may pose new or different risks concomitant to operational and security issues arising from the technology, lack of inter-operability with existing processes and infrastructures and issues related to data integrity, immutability and privacy. As DLT is an evolving technology that has not yet been proven sufficiently robust for wide scale implementation, implementing across jurisdictions draws its own challenges on legal aspects.

Having a well-founded, clear, transparent and enforceable legal basis is a core element of payment, clearing, and settlement arrangements. DLT can increase legal risks if there is ambiguity or lack of certainty about an arrangement’s legal basis. For transactions taking place across borders or in multiple jurisdictions, the law underpinning the activity would need to be confirmed or adopted in multiple jurisdictions in ways that are mutually compatible.

A DLT arrangement could have implications for broader financial market risks even though the benefit of DLT on

sharing data across key entities may lead to greater market transparency and more effective risk management across systems, wherein the interconnectedness is larger. With in-built tools of configuration on assessing macro-economic factors, automatic triggering of margin calls across FMIs in the system simultaneously may pose challenges on liquidity demand and its management in the system.

A number of financial market participants are assessing the possibility of using DLT for specific post-trade processes, from maintaining basic records to clearing and settling financial transactions. Their inclination towards DLT is driven by factoring efficiency gains from cost savings, faster settlement, greater resiliency and quicker reconciliation from the use of an automatically updated source of consistent information along the value chain. Market participants involved in post-trade processes are exploring the realisation of efficiencies through collectively maintaining a common, decentralised record of data, eliminating the need to reconcile different databases, which could be possible through DLT.

In the Indian context, a Proof-of-Concept (PoC) was structured and customised by the IDRBT to facilitate the feasibility analysis of blockchain technology for Indian banking and finance sector with two use cases that highlight banking and consumer interaction: domestic trade finance with a sight letter of credit and Enhanced Information Payments (EIP). Overall, the PoC provided a good demonstration of the use-cases and helped to broaden the understanding of the technology and its potential to other real-life applications, but scalability and security aspects need to be studied in detail.

References:

1. Bank for International Settlements (2017), Report of the Committee on Payments and Market Infrastructures on “Distributed Ledger Technology in Payment, Clearing and Settlement”, February.
2. Institute for Development and Research in Banking Technology (2017), White Paper on “Applications of Blockchain Technology to Banking and Financial Sector in India”, January.

from ₹10,000 to ₹20,000; special category of PPIs for merchants was introduced with higher limits on funds transfers. These

special measures, introduced on November 22, 2016, were extended till the completion of review of PPI guidelines. Further, issuance of

PPIs by banks was allowed to various entities including unlisted corporates/partnership firms/sole proprietorship /public organisations like municipal corporations and urban local bodies for onward issuance of PPIs to their staff/employees/contract workers.

- g. White Label ATM Operators (WLAOs) were allowed to source cash from retail outlets, provided that the quality and genuineness of currency notes, thus sourced, would be the responsibility of WLAOs.

Agenda for 2017-18

Responsive Regulation

Review of WLA Guidelines

IX.28 The scope of activities of WLAO, introduced in June 2012, were reviewed from time to time, *inter alia*, enabling the acceptance of international cards at WLAs, facilitating use of dynamic currency conversion for international cards, delinking cash supply from sponsor banks, and sourcing of cash from retail outlets. Nonetheless, WLAOs have not been able to meet the stipulated targets under the schemes chosen by them. Hence, it has been decided to review the WLA guidelines comprehensively, particularly from the perspective of WLA deployment targets.

Policy for Mobile Banking Services

IX.29 A review of the policy for granting permission to banks for mobile banking and prescribing minimum security standards would be undertaken.

Guidance for Inter-operability amongst PPIs

IX.30 In view of the thrust on digital payments, the draft Master Directions on issuance and operation of PPIs in India of March 20, 2017 envisaged inter-operability among PPIs in line with the Vision-2018. Instructions on implementation of

inter-operability among PPIs, in a phased manner, would be issued after the finalisation of the PPI guidelines.

Robust Infrastructure

Migration of Cheques to Cheque Truncation System (CTS)-2010 Standards

IX.31 Cheque issuing banks are required to make all efforts to withdraw non-CTS 2010 standard cheques in circulation by creating awareness among customers. Accordingly, the volume of non-CTS-2010 cheques to total inward volume was brought down to below 1 per cent in 2016 from 4 per cent in 2014. The requirement of paper to follow for cheques issued by the central government was also discontinued. Further measures would be undertaken to facilitate migration of cheques to CTS-2010 standards. Banks were also advised not to accept fresh /additional post-dated cheques and to convert the existing post-dated cheques to the National Automated Clearing House (NACH).

Effective Supervision

Oversight Framework for Authorised Payment Systems

IX.32 The framework for oversight of both retail and large value payment systems would be developed with a focus on off-site surveillance, regular self-assessment and need-based inspection of retail payments. The framework would draw from the principle that the intensity of oversight should be proportionate to the systemic risks or system-wide risks posed by a payment system or operator or participant.

Data Reporting by PSOs in XBRL Format

IX.33 The Bank is in the process of migrating to the XBRL reporting format. In this connection, the templates to collect data from entities would

be enhanced to include more granular details and new reporting templates would be added to facilitate the collection of detailed information from regulated entities.

Customer Centricity

Harmonisation of Customer Grievance Redressal Mechanism

IX.34 In the present scenario, different payment systems have different processes in place for customer grievance redressals. The Bank would undertake measures for their harmonisation to ensure uniformity in processes and timeframe for resolution.

Disclosure Framework for PSOs

IX.35 Towards further transparency in the payments space, the Bank would initiate measures to ensure that the PSOs clearly disclose the fees and terms and conditions of their services to the customers.

Confirmation of Payment in RTGS/NEFT

IX.36 Currently, originating banks for NEFT, after receiving a positive confirmation from the beneficiary bank, initiate an SMS or e-mail to the originator to convey the fate of the transaction. With the increasing volume of transactions in NEFT, this feature needs to be strengthened across all participating banks as envisaged in Vision-2018. The Bank would incorporate a similar feature of positive confirmation for RTGS transactions.

DEPARTMENT OF INFORMATION TECHNOLOGY (DIT)

IX.37 The main focus of DIT continued on providing robust technology infrastructure to ensure smooth running of the critical and systemically important payment and settlement systems in the country as also of the other IT systems for use by the Reserve Bank.

Agenda for 2016-17: Implementation Status

e-Kuber for Currency Management

IX.38 The Integrated Computerised Currency Operations Management System (ICCOMS), used by the Reserve Bank for currency management is being brought under the Bank's CBS, e-Kuber. The enhancement to e-Kuber would enable the Bank to have a near real-time view of the balances in the currency chests and facilitate efficient management of currency. A granular view of the currency chest transactions would also help to optimise the holdings of the currency chests. The system is being designed to facilitate automation of processes and integration with machines like currency verification processing system, note counting machines and kiosks. The system would also have linkage with Note Presses and provision to track currency in transit.

e-Kuber for Roll-out of GST

IX.39 The Reserve Bank's e-Kuber system has been assigned the responsibility of functioning as the 'aggregator' for all-India collections under Goods and Services Tax (GST) regime. It would also be a one stop source of data reporting to GST Network (GSTN), state governments and the Central Board of Excise and Customs (CBEC), the nodal government department for its implementation. As GST will be a pan-India taxation system, large quantum of transaction data will be handled by e-Kuber. The system follows ISO 20022 secured messaging protocols for interaction among agency banks, nodal government departments and GSTN, thereby facilitating exchange of information between CBS of banks and e-Kuber of the Reserve Bank. The system also provides for automatic reconciliation of differences among stakeholders using Memorandum of Errors using ISO messaging protocols.

e-Kuber for Government e-Receipts and e-Payments

IX.40 The standardised e-receipt and e-payment model was rolled out for various state and central government departments. This standardised model envisages integration of governments and banks' systems with e-Kuber for online transaction-wise reporting of receipts/ payments on behalf of government departments by bank branches. The e-scrolls and account statements are delivered electronically to governments in a straight-through-processing (STP) manner in ISO format for consumption by their treasuries. The e-receipt system has been adopted by 14 state governments till end-June 2017. The e-payment model envisages integration of government departments with the e-Kuber system for making direct payments to beneficiaries through NEFT. The payment e-scrolls and the account statements in ISO formats are sent to the treasuries for further use at their end. The e-payment model has been adopted by eight state governments till end-June 2017.

Electronic Document Management System (EDMS) Implementation

IX.41 The EDMS has been envisioned to manage and monitor the life cycle of documents. The objective is to ensure digitisation of the entire work flow processes so as to enhance efficiency through business process re-engineering (BPR), monitoring of work flow and also reducing storage and retrieval time for documents.

Enterprise Management System (EMS) for Enhanced Operational Efficiency

IX.42 In order to have a holistic approach towards monitoring the performance of high quality services in support of IT applications, the EMS solution is being implemented at the Data Centres for enhancing operational efficiency. The tools constantly monitor health of the servers,

network links, middleware and applications based on pre-set threshold values. The system generates alerts when thresholds are breached. The tools also facilitate service call logging, call escalation, incident reporting and monitoring. In addition, it builds knowledge base of the service tickets and enforcement of all processes related to change management, incident management, etc.

Review of the Bank's Information Security Policy

IX.43 Information security policy of the Reserve Bank is revised periodically to ensure continued protection against the changing contours of security threats. With the emerging threat landscape, where organised cybercrime and cyber warfare are taking prominence, the information security and cyber security policy of the Reserve Bank for its own information systems is being reviewed. The emphasis will be placed on recognising the growing use of mobile devices and also the new forms of attacks reported worldwide and to provide protection against these risks.

Enhanced Security at Data Centres

IX.44 The Reserve Bank has deployed Information Technology (IT) products, applications and services hosted in its Data Centres. However, with advanced, persistent and innovative threats surfacing every day, the security of IT infrastructure has to be monitored in a holistic manner. In this direction, as part of the Bank's cyber security reinforcement measures, an Information Security Operation Centre (iSOC) has been made operational to monitor, detect, prevent and mitigate various types of information and cyber security risks. Alerts received from various sources are promptly taken cognisance of and suitable action is initiated.

Wireless Local Area Network (WLAN)

IX.45 As part of the efforts aimed at accessibility of the information systems and to enable improved responsiveness to electronic communication, the

Wireless Local Area Network (WLAN) systems with the Wireless Intrusion Prevention System (WIPS) were successfully installed and made operational initially at some of the major office buildings and in training establishments.

Agenda for 2017-18

Currency Management System

IX.46 The currency management modules in e-Kuber are expected to be made operational by March 2018.

Full Roll-out of EDMS

IX.47 EDMS is being rolled out in a phased manner in all the offices of the Reserve Bank and is expected to be fully functional by December

2017. A roadmap to integrate other internal communication systems with the EDMS has been worked out and will be taken up after the initial modules are fully rolled out.

Facilitation for GST rollout

IX.48 A smooth roll-out of GST in collaboration with commercial banks has been completed in tandem with the introduction of GST from July 1, 2017.

Reserve Bank Information Technology Pvt. Ltd. (ReBIT)

IX.49 ReBIT will commence its full-fledged operations and assist the Reserve Bank in cyber security related areas during 2017-18.