Self-Service Technology-Enabled Financial Information System Services
CHAPTER - III

SELF-SERVICE TECHNOLOGY-ENABLED FINANCIAL INFORMATION SYSTEM SERVICES

3.1 Introduction

Indian banks are investing huge amount in the self-service technologies such as Automated Teller Machines (ATMs), Internet Banking, M-Banking, Credit/Debit cards and other technology-enabled systems. These technologies help to transform the financial services to their customers. Use of various self-service technology-enabled financial information systems in expanding banking financial services is one of the key focus areas of banks. The banking sectors in India are using various technology-enabled financial information services not only to improve their own internal processes but also to increase financial services to their customers without discrimination. Efficient use of technologies has facilitated accurate and timely management of the increased transaction volume of banks of from which comes with larger customer base. By designing and offering simple, safe and secure technology, banks reach at the doorsteps of the customers with increased their satisfaction. This chapter presents select general and technological background of the banking sectors of India. Further, it discusses M-Banking and its various financial information system services between bankers and customers through mobile phone technology. Finally, it discusses development of various self-service technology-enabled financial information system services in banking sector of India.

3.2 Background of the Banking sector of India

This part discusses general background on branch banking, banked centre, bank employees, computerizations in the banking sector, core banking system and ATMs based on its development.

3.2.1 Branch Banking in India

Branch banking is considered as one of the most important channels of the bank and is generally the most preferred channel from the Indian customer's point of view. The major concept of branch banking is referred as face-to-face interact between bank
employees and customers to avail the various financial services provided by the banks. For that reason, every financial year number of bank branches increased in the banking sector (public, private and foreign) of India and it is given in the following figure.

Figure 3.1 presents the number of bank branches in the banking sector throughout the country. The data explain that bank branches have grown in the last six years. The growth size, which was 54791 numbers in 2006, has grown to 74130 numbers with the growth rate of 35 percent by the end of March 2011.

3.2.2 Banked Centre

Banked Centre is a center having at least a branch or office of a commercial or co-operative bank or a temporary office, such as an extension counter or a satellite office or an off-site ATM of a commercial or co-operative bank. According to Banking Regulation Act, 1949 referred as banks (public, private and foreign sector banks, Regional Rural banks and Local area banks) are commercial banks. The Reserve Bank of India (RBI) classified the banking centres based on the population with respect to banking areas. Banked centres with less than 10,000 population those centres classified as ‘rural centers’, centers with a population of >=10,000 but <1, 00, 000 those centres classified as ‘semi-urban centres’, centers with a population of >=1,00,000 but >10 lakh those centres classified as ‘urban centres’, centres with a population of >=10 lakh those centres classified as ‘metropolitan centres’. The growth size of banked centre is given in the table below.
Table – 3.1: Population Group-wise Number of Banked Centres in India

<table>
<thead>
<tr>
<th>Year (At end-March)</th>
<th>Population Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rural</td>
</tr>
<tr>
<td>2009</td>
<td>28,440</td>
</tr>
<tr>
<td>2002</td>
<td>30143</td>
</tr>
</tbody>
</table>

Source: RBI, Branch Banking Statistics (2002 & 2009), Vol.3&4

It is observed from the table 3.1, the growth size of banked centre in India has down growth to 34,769 in the year of Mar’2009 with the decrease rate of 2 percent compared with 35502 in the year of Mar’2002. In semi-urban, urban and metropolitan areas except rural area banked centres have grown in the year of Mar’2009 compared with Mar’2002. On the other hand, rural area has decreased growth of banked centres in the year of 2009 compared with 2002.

3.2.3 Bank Employees in India

Under branch banking system, human resource is need for providing banking services to their customers. So, presently banks are recruit new employees in all categories in the scheduled commercial banks like, Officers, Clerks and Sub-ordinates and it is illustrated in the Table – 3.2. Presently, most of the banks provided that various technology-enabled services to their customers.

Table -3.2 Performance of Bank Employees in India (As on 31st March)

<table>
<thead>
<tr>
<th>Year/No. of employees</th>
<th>Officers</th>
<th>Clerks</th>
<th>Sub-ordinates</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>401060</td>
<td>349360</td>
<td>175608</td>
<td>926028</td>
</tr>
<tr>
<td>2009</td>
<td>351841</td>
<td>342930</td>
<td>174641</td>
<td>869412</td>
</tr>
</tbody>
</table>

Source: RBI,

Table 3.2, the performance of bank employees in India has grown to 926028 in the year of Mar’2010 with the growth rate of 6.5 percent compared with 869412 in the year of Mar’2009. All employee categories have increased in the year of Mar’2010 compared with Mar’2009.
3.2.4 Computerization in the Banking Sector of India

The concept of bank automation started in the year 1981, but it was during the period 1984-1987 banks in India started the branch level automation, making use of the then available MSDOS based stand alone computers. This initiative was taken by the banks on the basis of “First Rangarajan Committee Report” on bank computerization submitted in the year 1984. ALPMs (Advanced Ledger Posting Machines) were the fashion in those days. However, the pace of bank automation was very slow in the banks primarily owing to the lack of trade union consensus on bank automation.

Another committee was constituted in 1988 under the chairmanship of Dr. C Rangarajan, the then Deputy Governor of RBI to slate down a perspective plan on automation of banks for a five year period. This paved way to the implementation of multi-user Total Branch Automation (TBA) packages running on a LAN (Local Area Network), either on a Netware or a UNIX operating system. With the implementation of TBA, banks started to offer the facilities of exclusive Customer Terminal, Single-window transaction, on-line and off-site ATMs, Tele-Banking etc.

But with the advent of new generation private sector banks in India during 1994-1996, the real era of bank marketing started and these banks started to offer any where and any time banking facilities to its customers. This was possible for them mainly owing to the fact that they opted for the implementation of a WAN (Wide Area Network) based centralised banking solution rather than a LAN based branch banking solution to network their limited number of branch outlets.

Only 7827 branches of the Public Sector banks were identified for full branch computerization upto Mar’2000 of which around 4620 were computerized as on March’1999. Thereafter, Indian Public sector banks sustained to spend huge amounts on computerization and development of information technology-enabled services to their customers as per the suggestion given by Rangarajan Committee (II). For half-year expenditure incurred on computerization and communication networks by public sector banks is Rs. 1370 crore. New Private Sector and Foreign Banks have an edge in technological development over Public Sector Banks.
Table -3.3 Current Development of Computerization in Public Sector Banks as on 31st March (In %)

<table>
<thead>
<tr>
<th>Category</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully Computerized</td>
<td>71</td>
<td>77.5</td>
<td>85.6</td>
<td>94.6</td>
<td>95.7</td>
<td>97.8</td>
</tr>
<tr>
<td>Partially Computerized</td>
<td>21.8</td>
<td>18.2</td>
<td>13.4</td>
<td>6.4</td>
<td>4.3</td>
<td>2.2</td>
</tr>
</tbody>
</table>

Source: RBI, Annual Reports

The proportion of public sector bank branches which achieved full computerization increased from 71% as at end-March’2005 to 97.8% as at end-March’2010. Among the 58825 of public sector bank branches, 97.8% are fully computerized at the end of Mar’ 2010 whereas 100% of branches (17229 branches) of State Bank of India Groups are fully computerized. On the other hand, nearly 96.9% of branches of nationalized banks are fully computerized but it has 41596 branches in Mar’2010 and the remaining 3.1% of branches are partially computerized.

3.2.5 Core banking System (CBS) in India

After Globalization and Liberalizations of Indian market improved telecommunication facilities and reduction in hardware as well as networking cost changed the mind set of the banks in India to develop of CBS option. This also equipped them with the required technology leverage to compete in the Indian market by offering the similar technology products and services, as those offered by their new generation competitors.

Moreover, Banks find technology development has resulted in improved quality of service, any time/anywhere banking, focused product delivery, cross selling opportunities, multi-channel touch points for consumption of services, etc. The technological development is closely related to computerization in banks branches for acceptance of the core banking solution. This development report through the percentage of branches of public sector banks implementing CBS. The percentages of such branches increased by 11% at the end of March 2005 to 90% at the end of March-2010. The year-wise growth is given in the table below:
Table – 3.4: Branches under Core Banking System (In %)

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>Public Sector Banks</th>
<th>Nationalized Banks</th>
<th>State Bank Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004-05</td>
<td>11</td>
<td>10.1</td>
<td>13.2</td>
</tr>
<tr>
<td>2005-06</td>
<td>48.5</td>
<td>48</td>
<td>49.8</td>
</tr>
<tr>
<td>2006-07</td>
<td>44.4</td>
<td>35.4</td>
<td>67.2</td>
</tr>
<tr>
<td>2007-08</td>
<td>67.7</td>
<td>56.6</td>
<td>95</td>
</tr>
<tr>
<td>2008-09</td>
<td>81.4</td>
<td>73.4</td>
<td>100</td>
</tr>
<tr>
<td>2009-10</td>
<td>90</td>
<td>85.9</td>
<td>100</td>
</tr>
</tbody>
</table>

It is inferred from the Table-3.4 that within the public sector banks, state bank group of the bank branches have completely developed CBS in the March’2010.

3.2.6 Position of ATMs in India

ATM originally developed through cash dispensers in 1967 but this machine did not have magnetic tape. At present, this technology-provides a wide range of financial services of many other bank related functions via, cash withdrawal, balance enquiry, paying deposit, purchasing online products, account statement, fund transfers, paying taxes etc. In India, ATMs have become an important channel for delivering financial transactions and services. The spread of ATMs has increased from 27,088 in March’2007 to 74,505 in March’2011. To extend the facility of use of ATMs of one bank to the customers of other banks, banks have entered into bilateral or multilateral arrangements with other banks to have bilateral or inter-bank ATM networks. The Reserve Bank issued directives making use of own bank’s ATM or any other bank’s ATM free of charge for cash withdrawal, from April 1, 2009.
ATMs installed in the country at end-March’2011, nationalized banks had the largest share in growth of ATMs. This is followed by State Bank of India groups, new private, old private and foreign sector banks had 2nd, 3rd, 4th and 5th place respectively with respect to their number of ATMs. Finally, The volume of ATM transactions has increased from 17,797 lakh aggregating to Rs.4,38,151 crore during 2007-08 through 61132 ATMs to 23,530 lakh aggregating to Rs.6,16,456 crore during 2008-09 through 64608 ATMs.

3.2.7 Percentage of ATMs to total Branch in India

The percentage of ATMs to total branch has increased from 39.3 in March’2006 to 100.5 in March’2011. The percentage of ATMs to total branch has increased among the various banking sector except new private sector banks from March’2006 to March’ 2011. It is given in the table – 3.5

<table>
<thead>
<tr>
<th>Banking sector</th>
<th>2005-06</th>
<th>20010-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBI &amp; its associates banks</td>
<td>39.4</td>
<td>137.6</td>
</tr>
<tr>
<td>Nationalized banks</td>
<td>22.1</td>
<td>56.1</td>
</tr>
<tr>
<td>Foreign banks</td>
<td>339.8</td>
<td>431.2</td>
</tr>
<tr>
<td>Old private sector banks</td>
<td>33.9</td>
<td>85.7</td>
</tr>
<tr>
<td>New private sector banks</td>
<td>313.4</td>
<td>287.8</td>
</tr>
</tbody>
</table>

Source: RBI, Trend and Progress Reports
3.3 Concept of Self-Service Technology-enabled Financial Information System Services

In the financial services of banking sector, the shift to self-service technology has been just as all-encompassing. ATMs first made it possible for consumers to conduct transactions 24X7, and the concept has been further enriched through banking by card, phone, the Internet and mobile devices. Self-service has become such an integral part of retail banking that customers no longer view it as a distinct component of their total experience. Use of information technology and self-service has the potential for order-of-magnitude reductions to the cost of processing and transmitting information (Emmons & Greenbaum, 1998). Today, banking sectors are competing to increase their profit share in the market. For that reason, banks have moved from traditional banking to self-service technology-enabled banking services through the sustained adoption of various technologies. Adoption of self-service banking relies on effective information exchange between the bank and its customers. Customers will need information to reduce the uncertainty and equality of carrying out self-services compared to the services of branch banking (Daft & Lengel, 1984).

3.3.1 Factors Affecting Self-Service Technologies Adoption and Use of Banking

There are many factors that contribute to or detract from customer adoption rates and customer satisfaction regarding various self-service technology-enabled financial information system services. Some of these are: Quality of the financial information or products, Services offered by the banks, Cost of the financial services, Presentation of the services, Design of the self-service technology application, The self-service technologies ability for service recovery (even if caused by the customer), The way the banks promote/advertise the self-service technology, Alternate choices for the same service (offered by the bank), The bank’s ability to keep the self-service technology updated and to continuously improve the self-service technology services.

3.4 Concept of M-Banking

Mobile Banking (also known as M-Banking, cell phone banking, SMS Banking) is a term used for performing balance checks, account transactions, payments, credit applications etc through a mobile device such as mobile phones. At present, M-Banking is most often performed via SMS or mobile Internet, but can also be used by special programs called clients downloaded to the mobile device.
M-banking models have often been falling into two primary categories namely Bank-based model and a non-bank-based model. Each model has distinct means of operating, especially with respect to the relationship with the end customer in terms of establishing accounts, deposit taking, and lending Services.

3.5 Growth and Evolution of M-Banking

Mobile phone technology driven progress of mobile banking can be depicted as in the following

3.5.1 SMS Banking

SMS Banking is a technology-enabled service offering from banks to its customers, permitting them to operate selected banking services over their mobile phones using SMS messaging. SMS banking services are operated using both push and pull messages. Push messages are those that the bank chooses to send out to a customer's mobile phone, without the customer initiating a request for the information. Pull messages are those that are initiated by the customer, using a mobile phone, for obtaining information or performing a transaction in the bank account. The service is available on all phones (JAVA/non JAVA) with/without GPRS connection. Ordinary SMS charges are applicable. The following functionalities are available

Enquiry Services (Balance Enquiry/Mini Statement)
Mobile Top up
IMPS- Mobile to Mobile Transfer
Change MPIN etc.

3.5.2 Wireless Application Protocol (WAP) Banking

In time M-Banking progressed to WAP banking which allowed customers to access their bank accounts using a real time customer experience as information access was now real time and secure data communication mode. This improved the M-Banking service is available on java enabled /Android mobile phones (with or without GPRS) where the user is required to download the application on to the mobile handset. The service can also be availed via WAP on all phones (JAVA/non JAVA) with GPRS connection. The following financial information is available under this service.
Funds transfer (within and outside the bank)
Interbank Mobile Payment Services (IMPS)
Enquiry services (Balance enquiry/Mini statement)
Cheque book request
Demat Enquiry Service
Bill Payment (Utility bills, credit cards, Insurance premium), Donations, Subscriptions
Mobile Top up etc.

3.5.3 Mobile Banking Service over USSD (Unstructured Supplementary Service Data)

WAP banking, while quite popular, was restricted to a specific set of devices and the use of USSD came into practice which permitted a real-time interactive access to bank accounts on basic handsets. The service is available on all phones (JAVA/non JAVA) with/without GPRS connection. The following functionalities are available:

- Enquiry Services (Balance Enquiry/Mini Statement)
- Mobile Top up
- Funds Transfer (within Bank) etc.

3.5.4 Mobile web

The mobile communication technology progressed and mobile devices began supporting full-fledged web pages. This vastly enhanced customer experience on smart phones and sophisticated handsets which provided an almost desktop like experience. M-Banking began progressing in this direction by providing an almost Internet banking kind of experience on the mobile phone.

3.5.5 Application on mobile phone

The mobile devices became advanced and it was possible to have applications installed on the mobile phone to provide a rich user interface. The new generation mobile banking applications offer several comprehensive features such as:

- Pre-stored customer relationship information to improve response times and customer experience
- Enhanced communication layer security through use of encryption algorithms
- Richer user interface and mobile device specific user interface enhancing customer experience
• Richer user experience leads to more comprehensive features being offered on M-Banking

3.6 M-Banking Business Models

A wide spectrum of mobile banking models is evolving. It helps to retail bank services that process financial transactions on behalf of the banks. The business models of M-Banking different primary on the question that who will establish the relationship (account opening, deposit etc.) to the end customer, the bank or non-bank/telecommunication company. Another difference lies in the nature of agency agreement between bank and the non-bank models of branches banking can be classified into three broad categories-banks focused, bank-led and non-bank led.

3.6.1 Banks-focused model or Bank-based model

Only banks, licensed and supervised and have a physical presence, will be permitted to offer M-Banking services. Services shall be restricted only to customers of banks and holders of debit/credit cards issued as per guidelines. This model is additive in nature and may be seen as a modest extension of conventional branch-based banking.

In India in the year 2008, the Reserve Bank of India (RBI) issued M-Banking guidelines that permit only licensed banks with a physical bank presence in India to launch M-Banking using this bank focused model.

<table>
<thead>
<tr>
<th>Table – 3.6: M-Banking Guidelines for Bank –Focused Model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KYC</strong></td>
</tr>
<tr>
<td><strong>Maximum limit of transactions</strong></td>
</tr>
<tr>
<td><strong>AML/CFT</strong></td>
</tr>
<tr>
<td><strong>Electronic money (E-money) issuance</strong></td>
</tr>
<tr>
<td><strong>Payment system</strong></td>
</tr>
<tr>
<td><strong>Cross border money transfer</strong></td>
</tr>
<tr>
<td><strong>Other applicable law</strong></td>
</tr>
</tbody>
</table>
The disadvantage of the bank-based model is that, it may not be able to innovate as easily or respond as rapidly to market needs. In addition, a bank-based model is closely tied to existing services offered by a formal bank may have a more limited reach than a non-bank service.

3.6.2 Bank-led model

The bank-led model offers a distinct alternative to conventional branch-based banking in that customers availed services through whole range of retail agents instead of at bank branches. This model promises the potential to substantially increase the financial services outreach by using a different delivery channels. The bank-led model may be implemented by either using correspondent arrangements or by creating a JV between Bank and Telco/non-bank. In this model customer account relationship rests with the bank.

In simplest terms, an agent is an extension of the bank; they are able to provide commercial or transactional services e.g. customer service, keep records, handle cash and manage liquidity. Agents can play a role in a broad range of services including account opening, cash-in and cash-out services including disbursement of bank approved loans and person to person transfer services.

**Figure – 3.3: Bank-led model**

Bank-led model operating procedure

**Step 1:** Customer requests financial service.

**Examples of Services Offered:** Deposits and withdrawals; money transfers; loan/bill/tax payments; loan application and disbursal; account opening and credit card application acceptance.
Step 2: **Retail agent** checks customer’s ID and processes transaction, either directly through **bank’s infrastructure** or through **payment processing agent**.

**Examples of Retail Agents:** Retail outlets (grocery stores, lottery outlets, pharmacies, etc.); socially motivated organizations (NGOs, MFIs, etc.); post offices.

Step 3: **Bank** credits and debits bank accounts of customer and other party to the transaction.

**Examples of other Parties:** Includes retail agent (for deposits or withdrawals) and recipients of money transfers (other customers, utility companies, tax authorities, etc.).

### 3.6.3 Non-Bank-Led Model

The non-bank-led model is where a bank does not come into the picture (except possibly as a safe-keeper of surplus funds) and the non-bank organizations perform all the functions.

**Figure - 3.4: Non-Bank-Led Model**

Bank reconciliation

![Diagram of Mobile Wallet and Mobile Access]

In this model mobile phone can be transformed into a virtual wallet and utilized to make payments, transfer funds, and convert virtual money into cash without the need for a bank. Customers do not deal with a bank, nor do they maintain a bank account. A bank may not be involved at all. Instead, customers deal with a non-bank firm—either a mobile network operator or prepaid card issuer—and retail agents serve as the point of customer contact.

Rather than deposit money into and withdraw money from a bank account, customers exchange their cash for E-money stored in a virtual E-money account on the non-bank’s server, which is not linked to a bank account in the individual’s name.
E-money, according to the Basel Committee’s definition, is “a stored value or prepaid product in which a record of the funds or value available to the consumer for multipurpose use is stored on an electronic device in the consumer’s possession.” (Bank for International Settlements 2004).

**Non-bank-led model operating procedure**

**Step 1:** Customer requests sale or financial services using either cell phone or smart card.

**Step 2:** Retail agent checks customer’s ID and processes transaction on behalf of non-bank, using either cell phone or smart card reader.

**Step 3:** Non-bank registers transaction, updates the (virtual) E-money accounts belonging to the customer and the other party to the transaction.

**Step 4:** Bank (generally) holds net funds from the non-bank are issuance of E-money on behalf of bank. Bank does not have a relationship with customer or retail agent.

One of the greatest advantages to the non-bank model is that it can more easily increase access to financial services for those in low-income and rural areas because the customer does not need to engage in a direct contractual relationship with the bank. An additional potential advantage may be that the company offering the service may not be subject to the more restrictive regulations imposed on a traditional bank because it does not fall under the traditional definition of a “financial institution” or its services may not fall under the definition of a “banking activity.

The disadvantage to a non-bank based model is ensuring that sufficient capital is in place to mitigate any financial risk due to a lack of funds within the system. An additional disadvantage to the non-bank model is that it often necessitates the need for further review and refashioning of banking and/or telecommunications regulations in order to provide the service, as well as to provide adequate protection for consumer.

**3.7 M-Banking Technology**

Initial M-Banking services bestowed were obtainable via SMS (Short Message Service). Introduction of first archaic WAP (Wireless Application Protocol) supporting smart phones has enabled the usage of mobile web in 1999 by European banks. M-Banking technology is banking solutions which can either be server-side or client-side
which help customer access bank accounts through mobile device. Server-side technologies consist of applications which are built in server, far from the reach of the consumer’s mobile like, SMS banking. Client-side technologies like JAVA comprise of services or solutions embedded onto the consumer handset or SIM. Finally, the above M-Banking technology requires the consumer to either register or activate the application with the service provider in the market.

Service provider of the application or service determines the registration process so that it serves as the preliminary identification of the customer in order to prevent any fraud or evade any future risk which offering the service. In this mobile bank technology, the consumer data like card details, personal details will be stored on the server in a highly confidential environment.

SMS allows the customer to send and receive text messages using the keypad on the handset. Interactive Voice Response (IVR) is a technology that allows the customer to interact with an automated voice by selecting options from the menu provided. Latest generation M-Banking is similar to internet banking which requires either a browser or standalone service. WAP is best suggested to use for mobile internet banking which uses wireless communication, hence giving the customer the feel of internet banking over their mobile handsets.

3.8 Functioning Models for M-Banking Technologies

Technically speaking, most of these M-Banking services can be deployed using more than one of the following channels.

**IVR – Interactive Voice Response**

IVR or Interactive Voice Response service operates through pre-specified numbers that bank gives to their customers. Customers make a call at the IVR number and are usually greeted by a stored electronic message followed by a menu of different options. Customers can choose options by pressing the corresponding number in their keypads, and are then read out the corresponding information, mostly using a text to speech program.
**SMS – Short Messaging Service**

SMS uses the popular text-messaging standard to enable mobile application based banking. The way this works is that the customer requests for information by sending an SMS containing a service command to a pre-specified number. The bank responds with a reply SMS containing the specific information.

**WAP – Wireless Access Protocol**

WAP uses a concept similar to that used in Internet banking. Banks maintain WAP sites which customers access using a WAP compatible browser on their mobile phones. WAP sites offer the familiar form based interface and can also implement security quite effectively.

**Standalone Mobile Application Clients**

Standalone mobile applications are the ones that hold out the most promise as they are most suitable to implement complex banking transactions like trading in securities. They can be easily customized according to the user interface complexity supported by the mobile. In addition, mobile applications enable the implementation of a very secure and reliable channel of communication.

One requirement of mobile applications clients is that they require to be downloaded on the client device before they can be used, which further requires the
mobile device to support one of the many development environments like J2ME. J2ME is fast becoming an industry standard to deploy mobile applications and requires the mobile phone to support JAVA.

3.9 M-Banking Architecture

The M-Banking architecture is based on the specific requirement that the facility is provided through GPRS, GSM, CDMA, 3G etc. enabled mobile phones. The services can be provided to customers either directly by the bank or through a 3rd party vendor.

Third party service architecture is the more popular architecture as Banks can quickly roll out their M-Banking solutions by connecting to a 3rd party. In this architecture, the M-Banking servers are located at the 3rd party vendor’s data centre. These servers will talk to the Core Banking servers of the bank through a secured channel (dedicated or shared link) for authentication, authorization and transaction processing.

3.10 Third party Service Providers

M-Banking Services are offered through some third party service providers. They played an important role in providing Mobile phone services. The following are a few important third party service providers:

I. Payment Service Providers (PayMate, Ngpay, Obapay etc.,)

II. Technology Providers (Fundamo, Utiba, Mcheck, Accenture, Sybase 365, and Cell Trust etc)

III. Network Service Providers (BSNL, Airtel, Aircel, etc.,)
IV. Mobile Vendors (Nokia, Samsung, Sony, Black Berry Etc.,)
V. Distribution agents (Oxycash, Beam Express Points)
VI. Regulators (DIT, RBI)
VII. Other Forums (Mobile Payment Forum)

3.11 M-Banking through WAP with GPRS in the Banking Sector of India

The General Packet Radio Service (GPRS) is a new non-voice value-added service that allows Mobile Phones to be used for sending and receiving data over an Internet Protocol (IP)-based network. GPRS as such is a data bearer that enables wireless access to data networks like the Internet, enabling users to access E-mail and other Internet applications using Mobile Phones. With GPRS you can enjoy a continuous wireless connection to data networks (Internet) and access customer favorite websites, entertainment services and other web applications.

The facility of M-Banking through J2ME Application works on a secured, menu based and user friendly J2ME technology which is compatible to all GPRS/JAVA enabled mobile phones (Java version MIDP 2.0 and above) using both SMS & GPRS modes. In J2ME Mobile Banking user have to download and Install the J2ME MIDP Application in their Mobile Phones. This J2ME Mobile Application is GUI and Menu driven Application. In GPRS Mode the users have to Enable the GPRS Facility (GPRS is Internet Connection provided by the Service Provider for Mobile phones). The J2ME M-Banking application can also be downloaded from the bank’s website directly using their PC/Laptop and then transferred to the Mobile Phone using Data Cable or Bluetooth. To install the J2ME application in the mobile handset, the customer opens the application and the registration process will start automatically wherein the customer needs to enter the Customer ID & MPIN. The customer will register the numeric digit application password as per their choice. Upon successful validation of MPIN, Customer ID & the Mobile No. the system starts registration and synchronization of Linked Accounts & Added Beneficiary Accounts will happen automatically.

Each time the customer uses GPRS Banking he will be required to enter his User ID and PIN. It is anywhere and anytime banking and it depends upon Telecom's GPRS network that provides coverage.
3.12 Application Download and Registration

To access GPRS Banking via a Telecom mobile phone, simply follow these easy steps:

**Example: City Union Bank (CUB)**

Step 1: Navigate to http://www.cityunionbank.com/download from your Mobile Browser.
Step 2: Choose customer Application type GPRS Mode or SMS Mode Click the Link 'Click Here ' To Download the Application. It gets Automatically Saved in to customer Mobile Games Folder.
Step 3: To Launch Click the CUB_MBank Application
Step 4: Enter 'Your Customer ID and MPIN . Accept the Terms and Conditions - (Customer ID and MPIN already sent to you through Post).
Step 5: Choose 'Six Digit Application Password'. This Application password is to open the Application in future'.
Step 6: Click OK for sending the request.
Step 7: Alert from Mobile appears like This Application is not a trusted one, Click Yes to proceed.
Step 8: On Successful Registration ' Registration Successful Screen will appear'
3.12.1 Login Steps

Step1: Click the CUB MBank icon on the Mobile phone.
Step2: Login page with Welcome <name> message will appear.
Step3: Enter Application Password.(Already chosen six Digit Password)
Step4: On click of OK, menu will be displayed.
3.12.2 Settings

The customer can any time update his linked accounts/beneficiary account details. Whenever a new version of the application is released by the Bank, the same may be upgraded to the mobile. If the user wishes to remove the application from his mobile, the provision to deactivate the same is also made available.

Process: Upgrade

Step1: Choose Settings 'Menu' and click OK.
Step2: Choose 'UpGrade' Menu and click OK.
Step3: CUB MBank- UpGrade screen will appear. Enter 'MPIN' and Click OK for sending the request.
Step4: Confirmation screen will appear, Click Yes to proceed. Click No to make any changes.
Step5: If upgrade required then a link from which the upgraded version of the application can be downloaded will be displayed in the response screen.
3.13 Interbank Mobile Payment Service (IMPS) in India

The M-Banking facilitates the convenience of fund transfer to other bank accounts even on holidays by using IMPS. An IMP is an instant interbank electronic funds transfer service through mobile phones. An IMP facilitates customers to use mobile instruments as a channel for accessing their bank accounts and remitting funds therefrom. But, the customer needs to have a bank account with the bank which has enabled this facility. Further, the customer should enroll for M-Banking Service with the bank where customer has an account. The registration process shall be as per the bank's laid down procedures.
3.13.1 Provisions under IMPS

The beneficiary customer should have their mobile numbers registered with the bank where the customer maintains the account and where the customer intends to receive the credit and should have a valid Mobile Money Identifier (MMID) provided by the bank. MMID is a seven digit random number issued by the bank upon registration. Remitter (customer who wants to send money) and Beneficiary (customer who wants to receive the money) should have this MMID for doing this interbank funds transfer. No need to specifically enroll for M-Banking Service of the bank. For availing the MMID the customer may contact the branch where the customer maintains the account. The beneficiary details required are:

Beneficiary's mobile number

MMID of the beneficiary customer

- The customer can link the same mobile number to more than one account bank will allocate a Mobile Money Identifier (MMID) for each account of the mobile banking customers. Under this facility, the customer can transact on IMPS subject to a daily cap of Rs. 50,000/- per customer overall for transactions through M-Banking for the funds transfer. But, the customers cannot withdraw and / or deposit money using IMPS.

- The remitting customer can transfer funds to the beneficiary account in other banks. The remitting bank sends a confirmation SMS to the remitting customer about the transaction initiated by him / her as well as beneficiary bank sends a confirmation SMS to the beneficiary customer informing him / her of the credit in the account.

- To get the MMID for customer account(s), type SMS as MMID from your mobile and send it to +919551099007.
  Example: MMID

- In case, the customer does not need MMID for an account, it is possible to cancel MMID for a particular account, typing SMS as MMIDCANCEL <15digit acc.no> and sending it to +919551099007. And to cancel all the MMID's registered for your mobile number, type SMS as MMIDCANCEL and send it to +919551099007. Example: MMIDCANCEL 678901000034567 or MMIDCANCEL.
3.14 RBI guidelines for M-Banking in India

Following are the guidelines given by RBI in December, 2009:

- **Transaction limit**: Banks are now permitted to offer this service to their customers subject to a daily cap of Rs 50,000/- per customer for both funds transfer and transactions involving purchase of goods/services. Presently, such transactions are subject to separate caps of Rs 5000/- and Rs 10000/- respectively.

- **Technology and Security Standard**: Transactions up to Rs 1000/- can be facilitated by banks without end-to-end encryption. The risk aspects involved in such transactions may be addressed by the banks through adequate security measures.

- **Remittance of funds for disbursement in cash**

  In order to facilitate the use of mobile phones for remittance of cash, banks are permitted to provide fund transfer services which facilitate transfer of funds from the accounts of their customers for delivery in cash to the recipients. The disbursal of funds to recipients of such services can be facilitated at ATMs or through any agent(s) appointed by the bank as business correspondents. Such fund transfer service shall be provided by banks subject to the following conditions:-

  - The maximum value of such transfers shall be Rs 5000/- per transaction.
  - Banks may place suitable cap on the velocity of such transactions, subject to a maximum value of Rs 25,000/- per month, per customer.
  - The disbursal of funds at the agent/ATM shall be permitted only after identification of the recipient. In this connection, attention of banks is drawn to the provisions of the Notification dated November 12, 2009, issued by Government of India, under Prevention of Money Laundering Act, 2002, as amended from time to time.
  - Banks may carry out proper due diligence of the persons before appointing them as authorized agents for such services.
  - Banks shall be responsible as principals for all the acts of omission or commission of their agents.
  - Only banks, which are licensed and supervised in India, and have a physical presence in India will be permitted to offer M-Banking services
  - The services shall be restricted only to customers of banks and holders of debit/credit cards issued as per the extant RBI guidelines.
Only Indian Rupee based domestic services shall be provided. Use of M-Banking services for cross border transfers is strictly prohibited.

Banks may also use the services of Business Correspondent appointed in compliance with RBI guidelines, for extending this facility to their customers.

The guidelines on “Know Your Customer (KYC)”, “Anti Money Laundering (AML)” and Combating the Financing of Terrorism (CFT) from time to time would be applicable to mobile based banking services also.

Only banks that have implemented core-banking solutions would be permitted to provide M-Banking services.

Banks shall file Suspected Transaction Report (STR) to Financial Intelligence Unit – India (FID-IND) for M-Banking transactions as in the case of normal banking transactions.

Registration of customers for mobile service

Banks shall put in place a system of document-based registration with mandatory physical presence of their customers, before commencing M-Banking service.

On registration of the customer, the full details of the Terms and Conditions of the service offered shall be communicated to the customer.

On a review a transaction limit of Rs.50,000/- per customer per day had been mandated on Decembe’2009 and it has been decided to remove this cap on December 2011. However, banks may place per transaction limits based on their own risk perception with the approval of its Board.

3.15 Classification of M-Banking Technology-enabled Financial Information System Services

With the advent of this new channel, it is possible to bank from anywhere, at any time and in any condition, through either SMS or WAP, by linking one’s bank account to a mobile phone. Further, SMS Banking services can be classified into two categories. The first category, ‘Push’, is on the basis of origin of service, while the second category, ‘Pull’, is on the basis of nature of service i.e transaction-based/enquiry-based. In push, the bank sends account details to its clients based on some set of rules, whereas in pull, the same is sent by the bank based on client requests. Some of the banks are introducing both the services like Push Alert facility and Pull Alert Services. Presently, SMS Alert
facility is free to the customers. SMS Pull is the Normal Text Request Send to the predefined Mobile Number (Those who are all not having JAVA Enabled Mobile Phones). Moreover, necessity for M-PIN is to operating SMS Banking. M-PIN is a four digit password for authentication of request, for enquiry through SMS Banking.

<table>
<thead>
<tr>
<th>Table – 3.7: M-Banking Technology-enabled Financial Information System Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Push-based</strong></td>
</tr>
<tr>
<td>Transaction-Based</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Enquiry-based</td>
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<tr>
<td></td>
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</tbody>
</table>

3.16 M-Banking Technology-enabled Financial Information System Services – An Analysis

Banks are providing M-Banking technology-enabled financial information services through the following forms.

3.16.1 Enquiry based financial information services

Account Balance Enquiry, Fixed Deposit Balance, Mini Statement, Issued Cheque Status Enquiry, Branch Locator, Loan Services and Funds transfer limit enquiry services are available.

Process – 1: Balance Enquiry

Step1: Choose 'Enquiry' Menu and click OK.
Step2: Choose 'Balance Enquiry' Menu and click OK.
Step4: Choose 'Account Number' for which you want to check balance.
Step5: Enter 'MPIN' and Click OK for sending the request.
Step6: Confirmation screen will appear, Click Yes to proceed. Click No to make any changes.
Step7: Display balance for the queried Account Number
Process – 1: Balance Enquiry

Step1: Choose 'Enquiry' Menu and click OK.
Step2: Choose 'Cheque' Menu and click OK.
Step3: Choose 'Cheque Status' Menu and click OK.
Step4: CUB MBank – Cheque Status screen will appear. Enter 'Cheque Number' for which you want to find the status.
Step4: Choose 'Account Number'.
Step4: Enter 'MPIN'. Click OK for sending the request.
Step5: Confirmation screen will appear, Click Yes to proceed. Click No to make any changes.
Step6: Status of the queried Cheque is Displayed

Process – 2: Cheque Status Enquiry

Step1: Choose 'Enquiry' Menu and click OK.
Step2: Choose 'Cheque' Menu and click OK.
Step3: Choose 'Cheque Status' Menu and click OK.
Step4: CUB MBank – Cheque Status screen will appear. Enter 'Cheque Number' for which you want to find the status.
Step4: Choose 'Account Number'.
Step4: Enter 'MPIN'. Click OK for sending the request.
Step5: Confirmation screen will appear, Click Yes to proceed. Click No to make any changes.
Step6: Status of the queried Cheque is Displayed
Process – 3: Fixed Deposit Enquiry

Step1: Choose ‘Enquiry’ Menu and click OK.
Step2: Choose ‘FD Balance Enquiry’ Menu and click OK.
Step4: Choose ‘Account Number’ for which you want to check balance. Enter ‘MPIN’ and Click OK for sending the request.
Step5: Confirmation screen will appear, Click Yes to proceed. Click No to make any changes.
Step6: Deposit Details will be displayed
Process – 4: Loan Details Enquiry

Step1: Choose 'Enquiry' Menu and click OK.
Step2: Choose 'Loan Services' Menu and click OK.
Step3: Choose 'Balance Details' Menu and click OK.
Step4: Choose 'Account Number' for which the customer wants to check balance.
Step5: Enter 'MPIN'.
Step5: Click OK for sending the request.
Step6: Confirmation screen will appear, Click Yes to proceed. Click No to make any changes.
Step7: Loan Details for the queried Account Number is displayed
Process – 4: Loan Details Enquiry

Step 1

Step 2

Step 3

Step 4

Step 5

Step 6

Step 6

Step 7

Step 7
Process – 5: Mini Statement

Step1: Choose 'Enquiry' Menu and click OK.
Step2: Choose 'Mini Statement' Menu and click OK.
Step4: Choose 'Account Number' for which the customer wants to check statement.
Step5: Enter 'MPIN'.
Step5: Click OK for sending the request.
Step6: Confirmation screen will appear, Click Yes to proceed. Click No to make any changes.
Step7: Recent transactions made for the queried Account Number is displayed
Process - 6: Fund Transfer Limit Enquiry

Step1: Choose 'Enquiry' Menu and click OK

Step2: Choose 'Fund Transfer Day Limit' Menu and click OK.

Step3: CUB MBank – Fund Transfer Day Limit screen will appear. Enter 'MPIN' and Click OK for sending the request.

Step4: Confirmation screen will appear, Click Yes to proceed. Click No to make any changes.

Step5: Funds transfer limit for that day using mobile application is displayed
3.16.2 Transaction based financial information services

The user can effect funds transfer between his own Accounts, to Other Accounts (within bank), and to Other Bank Accounts through NEFT/RTGS.

Process – 7: Transfer Funds within Customer Own Accounts

Step1: Choose 'Transaction' Menu and click OK.
Step2: Choose 'Fund Transfer' Menu and click OK.
Step3: Choose 'Own Accts' Menu and click OK.
Step4: CUB MBank– Own Accts screen will appear.
Step5: Choose 'From Account Number'.
Step6: Choose 'To Account Number'.
Step7: Enter 'Amount' to be transferred.
Step8: Enter 'Remarks'.
Step9: Enter 'MPIN'.
Step9: Click OK for sending the request.
Step10: Confirmation screen will appear, Click Yes to proceed. Click No to make any changes.
Step11: On Successful, Fund Transfered Successfully is displayed with details
Process - 8: Transfer Funds To Other CUB Accounts (Within Same Bank)

Step 1: Choose 'Transaction' Menu and click OK.
Step 2: Choose 'Fund Transfer' Menu and click OK.
Step 3: Choose 'Other CUB Accts' Menu and click OK.
Step 4: CUB MBank – Other CUB MBank Accts screen will appear.
Step 5: Choose 'From Account Number'.
Step 6: Choose 'To Account Number'.
Step 6: Enter 'Amount' to be transferred.
Step 6: Enter 'Remarks'.
Step 7: Enter 'MPIN'. Click OK for sending the request.
Step 8: Confirmation screen will appear, Click Yes to proceed. Click No to make any changes.
Step 9: On Successful, Fund Transferred Successfully is displayed with details
Process - 8: Transfer Funds To Other CUB Accounts (Within Same Bank)

Step 1

Step 2

Step 3

Step 4

Step 5

Step 6

Step 7

Step 8

Step 9
Process – 9: Transfer Funds To Other Bank Accounts

Step1: Choose 'Transaction' Menu and click OK.
Step2: Choose 'Fund Transfer' Menu and click OK.
Step3: Choose 'Other Bank Accounts' Menu and click OK. This is followed by CUB MBank – Other Bank Accounts screen will appear.
Step4: Choose 'From Account Number'.
Step5: Choose 'To Account Number'.
Step6: Enter 'Amount' to be transferred.
Step6: Enter 'MPIN'.
Step6: Click OK for sending the request.
Step7: Confirmation screen will appear, Click Yes to proceed. Click No to make any changes.
Step7: On Successful, Fund Transferred Successfully is displayed with details.
3.16.3 Services based Financial Information Service

The user can Request for Cheque Book, Stop Payment of Cheque, Account Statement and Revocation of Stopped Cheque etc.

Process – 10: Account Statement Request
Step1: Choose 'Services' Menu and click OK.
Step2: Choose 'Account Statement' Menu and click OK.
Step3: Choose 'Account Number'.
Step4: Select – From Date.
Step5: Select 'To Date'.
Step6: Choose 'Mode of Delivery'.
Step7: Enter 'MPIN'.
Step7: Click OK for sending the request.
Step8: Confirmation screen will appear, Click Yes to proceed.
Step9: On Successful it displays 'Request registered Successfully'
Process – 10: Account Statement Request

Step 1

Step 2

Step 3

Step 4

Step 5

Step 6

Step 7

Step 8

Step 8

Step 8

Step 8
Process – 11: Cheque Book Request

Step1: Choose 'Services' Menu and click OK.
Step2: Choose 'Cheque Book' Menu and click OK.
Step3: Choose 'Account Number'.
Step4: Select – No of Leaves
Step5: NOTE: 'For SB 20 Leaves. CA and CCOD 50 Leaves'.
Step6: Choose 'Mode of Delivery'.
Step7: Enter 'MPIN'.
Step8: Click OK for sending the request.
Step9: Confirmation screen will appear, Click Yes to proceed.
Step10: On Successful it displays 'Request registered Successfully'
3.16.4 Miscellaneous Services under M-Banking

The customer can change MPIN / Application Password can add/view/delete beneficiary account details.
Process - 12: Change MPIN

Step 1: Choose 'Miscellaneous Services' Menu and click OK.
Step 2: Choose 'Change Mpin' Menu and click OK.
Step 3: CUB MBank - Change MPIN screen will appear
Step 4: Enter MPIN in the 'Current Mpin' text box.
Step 5: Enter New Mpin to be changed, re-enter new Mpin for Confirmation
Step 6: Click OK for sending the request.
Step 7: Confirmation screen will appear, Click Yes to proceed. Click No to make any changes.
Step 8: If customer receives the message 'MPIN has been Changed Successfully' then the MPIN has been changed successfully. In future use the changed MPIN.
3.17 Development of Self-Service Technology-enabled Financial Information System Services

This part discusses the select payment and settlement system services, self-service technology-enabled financial information system services in India based on its growth. World over, the payment and settlement systems segment of the financial system have been witnessing rapid changes due to the developments in ICT. The changes are either spearheaded by the Central banks/Governments, or banking sector. The aim of most of these developments have been to (i) reduce the usage of currency and paper based payment instruments and (ii) facilitate faster movement of funds in the economy – increase the efficiency with safety and security arrangements. The developments in technology resulted in numerous innovations in the payment system area. These innovations resulted in systems which are more efficient in terms of the time and effort needed to process payment instructions. The RBI has taken several initiatives to develop and promote technology-enabled payment and settlement system like electronic payments infrastructure. The RBI introduced Electronic Clearing Service (ECS) and Electronic Fund Transfer (EFT) system in 1995, Internet Banking in June 2001, Real Time Gross Settlement (RTGS) system in March 2004, National Electronic Fund Transfer (NEFT) system in November 2005. Cheque Truncation System (CTS) in February 2008 and Mobile Payment (M-Payment).

3.17.1 Electronic Clearing Services (ECS)

The ECS introduced by the RBI in 1995 is similar to the Automated Clearing House system that is operational in certain other countries like the US. ECS is another technology-enabled payment service between two bank accounts. ECS is a mode of electronic funds transfer from one bank account to another bank account using the services of a clearing house. Generally, it is used for bulk transfers from one account to many accounts or many accounts to one account. Banking sector of India have two types of ECS. They are,

ECS (Credit) is used for affording credit to a large number of beneficiaries by raising a single debit to an account, such as dividend, interest or salary payment.
ECS (Debit) is used for raising debits to a number of accounts of account holders/consumers for crediting a particular institution.

Telephone companies, electricity supplying companies, electricity boards, credit card collections, collection of loan installments by banks and financial institutions, and investment schemes of Mutual Funds etc. eligible to participate in the ECS Debit scheme. This facility is currently available at 70 centers in the country.

<table>
<thead>
<tr>
<th>Technology/Year</th>
<th>Volume (In millions)</th>
<th>Value (Rs. Crores)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008-09</td>
<td>2009-10</td>
</tr>
<tr>
<td>ECS Debit</td>
<td>160.1</td>
<td>149.3</td>
</tr>
<tr>
<td>ECS Credit</td>
<td>88.4</td>
<td>98.1</td>
</tr>
</tbody>
</table>

Source: RBI, Annual Reports 2010-11

Table – 3.8 reported that ECS technological development through the volume of ECS (debit) transactions and it has decreased from 160.1 million during 2008-09 to 156.7 million during 2010-11. But, the value of ECS transaction has increased from Rs. 66,976 crore during 2008-09 to Rs. 73,646 crore during 2010-11. On the other hand, ECS (credit) volume of transactions has increased from 88.4 million aggregating to Rs.97, 487 crore during 2008-09 to 117.3 million aggregating to Rs.1, 81, 686 crore during 2010-11.

### 3.17.2 Electronic Fund Transfer (EFT) System in India

Firstly, EFT system was operationalized in 1995 through 15 centres. The EFT system presently covers all the branches of the 27 public sector banks and 55 scheduled commercial banks at the centres of Ahmedabad, Bangalore, Bhubneshwar, Kolkata, Chandigarh, Chennai, Guwahati, Hyderabad, Jaipur, Kanpur, Mumbai, Nagpur, New Delhi, Patna and Thiruvananthpuram. It helps to exchange of finance or fund from one bank account to another bank account. If a branch has computer facility, it can transmit funds transfer information electronically to its service branch either on a floppy or through a network. This is followed by Special EFT (SEFT) scheme which came into
effect from April 1, 2003, in order to provide for quicker funds transfers between accounts. Moreover, National Electronic Fund Transfer (NEFT) came into effect on November’ 2005, in India. It is a nation-wide payment system facilitating fund transfer between individuals, firms and corporate can electronically transfer funds from any bank branch to any individual, firm or corporate having an account with any other bank branch in the country. This facility is currently available at over 46,300 bank branches throughout the country. NEFT provided for integration with the Structured Financial Messaging Solution (SFMS) of the Indian Financial Network (INFINET). The growth of EFT/NEFT in India is given in the table below:

<table>
<thead>
<tr>
<th>Technology/Year</th>
<th>Volume (In millions)</th>
<th>Value (Rs. Crores)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008-09</td>
<td>2009-10</td>
</tr>
<tr>
<td>EFT/NEFT</td>
<td>32.2</td>
<td>66.3</td>
</tr>
</tbody>
</table>

Source: RBI, Annual Reports 2010-11

Table – 3.9 provides technological growth of EFT/NEFT through their volume and value of transactions. It is reported that EFT/NEFT has increased from 32.2 million aggregating to Rs.2, 51, 956 crore during 2008-09 to 132.3 million aggregating to Rs.9, 39, 149 crore during 2010-11.

3.17.3 Internet banking

The recommendations of the Working Group on Internet Banking in 2001 were accepted for phased implementation and detailed guidelines on internet banking were issued by the RBI to the banks in June 2001, for adoption by the banks offering internet banking facilities. Now, India has around 23 million internet banking users. The cost per transaction of Internet Banking is Rs.10 which is less than the branch banking (Rs.66) and ATN (Rs.22). Under Internet banking is possible to conduct all forms of electronic banking.
3.17.4 Real Time Gross Settlement (RTGS)

The RTGS was operationalised by the RBI in March 2004, which enables settlement of transactions in real time, on a gross basis. RTGS is fully secured electronic funds transfer system where banks and customers can receive payments on real time basis. Presently, more than 48,300 bank branches now accept requests for remittance through RTGS system for customer transactions as well as inter-bank transactions.

'Real Time' means the processing of payment transaction at the time they are received rather than at some later time. 'Gross Settlement' means the settlement of funds transfer instructions occurs on one to one basis. It is mainly focus on large value transactions. The minimum amount to be remitted through RTGS is Rs. 2 lakh and upper limit is not restricted. The customer's transactions made from 9.00 hours to 16.30 hours on week days and from 9.00 hours to 13.30 hours on Saturdays under RTGS.

Under RTGS, payment receiving banks no charge to be levied but processed bank charged Rs. 30 per transaction between the amount of Rs. 2 lakh to Rs. 5 lakh. If, transfer amount is more than Rs. 5 lakh, processed bank levy on charge Rs. 55 per transaction.

Remitting customer has to provide the various information to the bank under remittance of RTGS via, amount to be remitted, remitting customer’s account number which is to be debited, name of the beneficiary bank, name of the beneficiary customer, account number of the beneficiary customer, sender to receiver information, if any, The IFSC number of the receiving branch. Here, presents the growth of RTGS is given in the table below:

<table>
<thead>
<tr>
<th>Technology/Year</th>
<th>Volume (In millions)</th>
<th>Value (Rs. Crores)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008-09</td>
<td>2009-10</td>
</tr>
<tr>
<td>RTGS</td>
<td>13.4</td>
<td>33.2</td>
</tr>
</tbody>
</table>

Source: RBI, Annual Report 2010-11
Development of RTGS technology explains, the volume of RTGS transactions has increased from 13.4 million aggregating to Rs.3,22,79,881 crore during 2008-09 to 49.3 million aggregating to Rs.4,84,87,234 crore during 2010-11.

3.17.5 Cheque Truncation System (CTS)

The latest electronic payment product introduced by the RBI is the Cheque Truncation System, which was launched, on a pilot basis, in the National Capital Region of New Delhi on February 1, 2008, with the participation of 10 banks. At present all the banks are participating in the system through 53 direct member banks. The main objective of the CTS is to improve the efficiency and substantially reduce the cheque processing time in the system. In contrast, the main advantage of cheque truncation is that it obviates the physical presentation of the cheque to the clearing house; instead, the electronic image of the cheque would be sent to the clearing house. The CTS would enable the realisation of cheques on the same day, and provide a more cost-effective mode of settlement than manual and MICR clearing. Smaller banks, which may find it unviable to set up the infrastructure, could utilise the services of service bureaus set up for this purpose by a few larger banks.

3.17.6 Card banking in India

In 1946, the origin of the bank credit card concept was introduced by John C. Bigging, at the Flat bush National Bank of Brooklyn, New York. This is followed by Bank of America which developed the present credit card operating system in the year of 1960. Thereafter, US banks established Visa International and Master Card together command the bulk of the credit card business in the world. Moreover, debit card helps the customers for conducting various financial transactions. For the security purpose, Reserve Bank of India (RBI) declared that for every transaction through ATMs requires password from Jan’2011. In the end of March’ 2011 Indians card based value of financial information is Rs. 114207 Crores. Table – 3.11 provides development of card based financial information in the Indian context from 2005-06 to 2010-11.
Table – 3.11: Performance of Card-based Financial Information Value of Payment of Transactions (In Rs. Crores)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit</td>
<td>33,886</td>
<td>41,361</td>
<td>57,985</td>
<td>65,356</td>
<td>61,824</td>
<td>75,516</td>
</tr>
<tr>
<td>Debit</td>
<td>5897</td>
<td>8,172</td>
<td>12,521</td>
<td>18,547</td>
<td>26,418</td>
<td>35,705</td>
</tr>
</tbody>
</table>

Source: RBI, Annual Report 2009-10 & 2010-11

3.17.7 M-Banking

With the rapid growth in the number of mobile phone subscribers in India, the banks have been exploring the feasibility of using mobile phones as an alternative channel of delivery of banking services. A few banks have also started offering, through the mobile phone, information-based services like balance enquiry, stop-payment instruction of cheques, record of last five transactions, etc. In addition, some banks are providing transaction (payment) based services to their customers considering that the use of this technology for the banking services is relatively new and calls for appropriate safeguards to ensure security of financial transactions, the RBI has formulated the ‘Draft Operating Guidelines for Mobile Payments in India’, through a consultative process and placed them on the RBI’s website in June 2008 for public comments. It is expected that the guidelines when operationalised would help strengthen the operating environment for mobile banking in the country. Now, 36 out of 171 commercial banks are implementing m-banking facilities to their customers. The following groups of the banks are providing M-Banking services including M-Payment. They are, State Bank of India & Its 6 Associate banks, 12 Nationalized banks, 12 Other scheduled commercial banks or Private banks, 4 Foreign Banks and 1 Co-operative bank. Now, the RBI has approved 52 banks for extending the M-Banking service. Table – 3.12 provides development of M-Banking based financial information services in the Indian context from Financial Year 2009-2010 (11 Months) to 2010-2011.
Table – 3.12: M-Banking based Financial Information Service in India

<table>
<thead>
<tr>
<th>Banks</th>
<th>Volume of M-Banking Transaction</th>
<th>Value of M-Banking Transaction (Rs. in '000)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2009-2010</td>
<td>2010-2011</td>
</tr>
<tr>
<td>SBI &amp; Its Associate banks</td>
<td>762233</td>
<td>5242081</td>
</tr>
<tr>
<td>Nationalized banks</td>
<td>19937</td>
<td>162240</td>
</tr>
<tr>
<td>Other scheduled commercial banks or Private banks</td>
<td>502059</td>
<td>1273768</td>
</tr>
<tr>
<td>Foreign Bank</td>
<td>141915</td>
<td>174252</td>
</tr>
<tr>
<td>Co-operative bank</td>
<td>0</td>
<td>44</td>
</tr>
</tbody>
</table>

Source: RBI

Table – 3.12 explains that the volume and value of M-Banking transactions in SBI and Its Associate banks, nationalized banks, private banks and foreign banks increased during the year 2010-2011 compared with 2009-2010. But, co-operative bank started M-Banking in the financial year of 2010-2011.

3.18 Summation

This completed chapter concluded that self-service technology-enabled financial information system services is not affected by branch banking, banked centres in urban, semi-urban and metropolitan area and the number of bank employees because these are upward growth compared with past performance. Further, nearly hundred percent of the public sector banks developing computerization as well as 9/10th of these bank branches has developed core banking system. Moreover, M-Banking development is not affected by the usage of ATMs because the number of ATMs also has upward growth. Further, this chapter has given detailed discussion about M-Banking Technology-enabled financial information system in India. It facilitates financial services through the transaction, enquiry and request base. Enquiry and request based M-Banking technology-enabled financial information system service includes more number of services like, enquiry on account balance, account statement, request for cheque book etc. Transaction
based M-Banking technology-enabled financial information system service include mobile payment like transfer of funds, payment of bills and other payment services. Entire measure on the growth of M-Banking technology-enabled financial information system is not possible because the number of enquiry and request based services about various financial information services is not published by RBI and Banks. For that reason, this study measures the growth of M-Banking technology-enabled financial information system through the mobile payment service i.e volume and value of M-Banking transaction and it is analyzed in the Chapter - IV. So, M-Banking technology-enabled financial information system is hereafter referred to as M-Banking technology-enabled financial information service. Finally, this chapter discusses the growth of various self-service technology-enabled financial information system services including some payment and settlement system services. ECS debit, ECS credit, RTGS, M--Banking also has increasing growth compared with past performance in terms volume and value. Card banking has increasing growth in terms of value of financial services.