Chapter: 4

Innovative Banking Services
### Chapter-4

**Innovative banking services**

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<td><strong>Reference</strong></td>
<td></td>
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</tbody>
</table>
Financial liberalization policy affected technology upgradation programme in banking industry. The Reserve Bank of India and the Task force on information technology provided a vital boost in Indian economy. The RBI has borne the cost of Rs. 35 crore to install VSATs and HUBS to provide information technology infrastructure to the entire banking industry in India.

Banking Sector also takes a step forward a hi-tech technology based services like SOHO (Small office home office banking), ICR (Chat relay system), OLTAS (Online tax accounting system), RPS (Retail payment system), SEFT (Special electronic funds transfer) and COMET (Computerized message transfer). In this regard, the researcher has tried to provide information about various types of technology based services like, ATM (Automatic teller machine), CBS (Core banking solution), Net banking and online banking, Mobile banking, Tele banking, Credit card, Smart card, EFT (Electronic fund transfer), EBP (Electronic bill payment), EDI (Electronic data interchange), E-cheque (Electronic cheque), MICR (Magnetic ink character reader), E-zwich, RTGS (Real time gross system) etc, and its recent progress report in Indian market perspective in the present chapter.
Chapter-4

Innovative banking services

4.1 Innovative banking services

In the present era of globalization many changes are being brought in the bank. The changes which are done or being done in the operation of commercial activities, management procedures and methods are named as innovative banking. In other words the changes which are bought in the banking field for the implementation of new ideas and methods is known as innovative banking.

Globalization has bought rapid competition in the field of banking in the country. Many new services are provided by the innovative banking by domestic and foreign banks established in the private sector. As a result of this, public sector bank of India are also providing innovative banking services.

After Globalization, the banking sector customer has become the most important for the banks. Banks are announcing many new schemes and services for attracting customers. Even the public utilities are also trying to be made better in the banks, so that customers do not face any kind of problem. Separate branches of specialized services, 24 hours transaction services, internet and tale-banking are becoming quite common now a day. Now the first priority of banks is to the customers’ earlier profit and loss are not much important. In such conditions, customers are becoming more and more important for the banks.

The existence of these banks which do not provide better services to their customers is danger for the banks. Alerting technology is one that expected to grow strongly particularly as customers realize that it offers them increased control over interaction with banks.
The Internet based banking services of the banks can be classified as under:-

4.1.1 ATM (Automatic teller machine)
4.1.2 CBS (Core banking solution)
4.1.3 Net banking and online banking
4.1.4 Mobile banking
4.1.5 Tele banking
4.1.6 Credit card
4.1.7 Smart card
4.1.8 EFT (Electronic fund transfer)
4.1.9 EBP (Electronic bill payment)
4.1.10 EDI (Electronic data interchange)
4.1.11 E-cheque (Electronic cheque)
4.1.12 E-zwich
4.1.13 MICR (Magnetic ink character reader)
4.1.14 RTGS (Real time gross system)
4.1.15 STEPS (State bank payment system)
4.1.16 Shared payment network system
4.1.17 Electronic authentication and signature
4.1.18 SWIFT (Society for worldwide interbank financial telecommunication)
4.1.19 ACH (Automatic clearing house)
4.1.20 SSC and FEC (Settlement securities system & Foreign exchange clearing)
4.1.21 Digicash (Digital cash)
4.1.22 Netcash
4.1.23 Millicent
4.1.24 Mondex
4.1.1 ATM

ATM means automated teller machine or also known as an automatic banking machine. First ATM introduced by John Shepherd Barron in 1960. ATM is a computerized tele-communications device that provides the clients of a financial institution with access to financial transaction in a public space without the need for a cashier, human clerk or bank teller. On most modern ATMs, the customer is identified by inserting a plastic ATM card with a magnetic stripe or a plastic Smartcard with a chip that contains a unique card number and some security information, such as an expiration date or CVVC (CVV), authentication is provided by the customers entering a personal identification number using as ATM. Customer can access their bank accounts in order to make cash withdrawals and check their account balances.

ATM is also known as different terminology like,

1. Automated banking machine in Britain
2. Any time money in India
3. Bancomat in Europe Russia
4. Multi banco in Portugal
5. Money machine
6. Bank machine
7. Cash machine
8. Hole-in-the-wall
9. Cash point

**Picture:-4.2**
First ATM transaction


British actor Reg Varney using the world’s first ATM in 1967 located at a branch of Barclays bank, Enfield and the system was developed
by De la rue. First ATM situated in Enfield town in North London, United Kingdom on 27 June, 1967 by The Barclays bank. This instance of the invention is credited to John shepherd Barron.

 AutoMapper in India

An Automated teller machine is an electronic computerized telecommunication device that allows a financial institution’s customers to directly use a secure method of communication to access their bank account order to make cash withdrawals. In India bank has expanded its branch and ATMs and finding customers nearby. The ATM status in India is following manner.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Bank Group</th>
<th>Number Of branch</th>
<th>Number of ATM On site</th>
<th>Off site</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nationalised Bank</td>
<td>44,298</td>
<td>15,691</td>
<td>9,145</td>
<td>24,836</td>
</tr>
<tr>
<td>2</td>
<td>State Bank Group</td>
<td>17,913</td>
<td>14,104</td>
<td>10,547</td>
<td>24,651</td>
</tr>
<tr>
<td>3</td>
<td>Old Private Bank</td>
<td>4,817</td>
<td>2641</td>
<td>1,485</td>
<td>4,126</td>
</tr>
<tr>
<td>4</td>
<td>New Private Bank</td>
<td>6,785</td>
<td>8007</td>
<td>11518</td>
<td>19525</td>
</tr>
<tr>
<td>5</td>
<td>Foreign Bank</td>
<td>317</td>
<td>286</td>
<td>1081</td>
<td>1367</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>74,130</strong></td>
<td><strong>40,729</strong></td>
<td><strong>33,776</strong></td>
<td><strong>74,505</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: - RBI trends and progress report, March 2011
Graph: 4.1

Number of Branches and ATM of All Indian Bank

- **Biometric ATM**
  
  Biometric means using the body as a password. Biometric ATM is classified on the basis of three types of characteristics of an individual. The Biometric ATM solution consists of central server which holds a repository of customer finger prints and verification of accounts. The central server provides platforms of independent; it uses Java run time on UNIX and Oracle/ McIntosh SQL server customisation to bas 24 switches²
  
  - Biometric ATM technique divides into various parts namely:
    
    - **Physiological technique.**
      
      Included finger, hand and fingerprint
    
    - **Geometry technique.**
      
      Included eye, retinas, iris, face, and wrist (vein)
    
    - **Behavioral technique.**
      
      Included Voice, signature, typing and pointing

Biometric ATM technique divides into various parts namely:
Diagram: -4.1
Classifications of Biometric ATM

Picture: -4.3
Finger print ATM

1. **Fingerprint verification**
   In this technique, Bank customer’s finger matching a minutiae and straight pattern and unique marks in finger print.

2. **Hand geometry**
   Hand geometry is a biometric solution that reads a person’s hand and/or fingers for access. This technique concerned with measuring the physical characteristics of the customer hand and fingers.

3. **Voice verification**
   This techniques followed some types of word, key, number soughted by the customers at the front of ATM machines and Biometric ATM machines recognition voice and identify the customers voice next process has been done.

4. **Retinal scanning**
   This technique used to identify the unique patterns of the retina of the customers. Retinal scanning devices are the most accurate physical biometric available today since there is no known way to replicate a retina.

5. **Iris scanning**
   Iris scanning is eye related biometric systems, Iris scans analyze the features that exist in the colored tissue surrounding the pupil of an eye, it is utilized a conventional camera element and requires no intimate contract between user and reader.

6. **Facial recognition**
   Facial recognition analyzes the characteristics of a person's face. Access is permitted only if a match is found. The process works when a user faces a digital video camera, usually standing about two feet from it, where the overall facial structure, including distances between eyes, nose, mouth, and jaw edges are measured.
7. **Signature verification**
   The technology examines such dynamics writing speed of the persons, directions of writing, and pressure of ball point writing.

8. **Vascular patterns**
   Vascular patterns described a full picture of the veins in a person's hand or face. The thickness and location of these veins are believed to be unique enough to an individual to be used to verify a person's identity.

9. **Keystroke recognition**
   This keystroke recognition technology has recently gained in the music industry; this information would be used to protect songs pirates against unauthorized distribution and illegal use.
   There are various banking products of biometric but the most commonly used biometrics are fingerprint scanning, voice recognition, retina scan and face recognition.

   - **Developing future biometric ATM**

   1. **Palm print**
      Palm print biometrics is a system that measures the physical characteristics of an individual’s palm. The specified palm is placed on a reader where the measurements are taken.

   2. **Vein pattern**
      Vein pattern matching involves scanning the vein patterns on the back of a customer’s hand. The customer’s place their hands into a reader panel. Inside a small black and white camera and LED array is used to capture the digital image. There is the difficulty of identifying vein pattern changing over a time.

   3. **Ear shape, body odor and gait analysis**
      Ear shape is a physical biometric that measures the shape of the ear structure. This ATM works same manner of facial recognition.
4. **Body odor**

Body odor is a system that analyzes the natural body odor given off by an individual. Electronic sensors are used to gather the odor, such as the back of the hand.

5. **Gait analysis**

Gait analysis is the analysis of the way an individual walks. This usually includes some sort of mat with sensors that an individual will then walk across. Measurements of the speed, pressure applied by the foot.

In India, banks introduced various types of ATM services, such as the bank. Union Bank of India installed a first 'Kisan ATM' at Sivagangai branch, Tamil Nadu. Andhra Bank has launched two mobile biometric-access ATMs in Hyderabad and Secunderabad. Dena Bank has launched the Bio-metric ATMs in Gujarat, and Corporation Bank has also introduced 'talking' biometric ATMs. These ATMs are 'talking' to the farmers in their own local language. Most of the banks provide thumb impression biometric ATM services because of easy access.

### 4.1.2 Core Banking Solution (CBS)

Core Banking is normally defined as the business conducted by a banking institution with its retail and small business customers. Many banks treat the retail customers as their core banking customers and have a separate line of business. Larger business is managed via the corporate Banking division of the institution. Core banking basically is depositing and lending of money. The normal core banking function will include deposit accounts, loans, mortgages, and payments. The bank makes these services available across multiple channels like ATMs, internet banking, and branches.
Core banking is all about knowing customers’ needs, provide them with the right products at the right channels, 24 hours a day, 7 days a week using technology aspects like internet, mobile, ATM. Regarding the banking status in India, in March 2004, 44% of total branches of banks and in March 2006, 28.9% of total branches of banks were converted into CBS branches.

### Table: 4.2

#### Computerization in Indian Bank (As at end-March 2010)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the Bank</th>
<th>Branches under CBS</th>
<th>Branches already fully computerised</th>
<th>Fully computerised branches</th>
<th>Branches partially computerised</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public Sector Bank</td>
<td>90.0</td>
<td>7.7</td>
<td>97.8</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>Nationalized bank</td>
<td>85.9</td>
<td>10.9</td>
<td>96.9</td>
<td>3.1</td>
</tr>
<tr>
<td>1</td>
<td>Allahabad Bank</td>
<td>39.9</td>
<td>59.9</td>
<td>99.8</td>
<td>0.2</td>
</tr>
<tr>
<td>2</td>
<td>Andhra Bank</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Bank of Baroda</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Bank of India</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Bank of Maharashtra</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Cannara Bank</td>
<td>59.4</td>
<td>40.6</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Central Bank of India</td>
<td>34.2</td>
<td>51.6</td>
<td>85.7</td>
<td>14.3</td>
</tr>
<tr>
<td>8</td>
<td>Corporation Bank</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>Dena Bank</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Indian Bank</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Indian Overseas Bank</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Oriental Bank of commerce</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Punjab National Bank</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Punjab &amp; Sind bank</td>
<td>-</td>
<td>13.3</td>
<td>13.3</td>
<td>86.7</td>
</tr>
<tr>
<td>15</td>
<td>Syndicate Bank</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>Uco Bank</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>Union Bank of India</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>United Bank of India</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>19</td>
<td>Vijya Bank</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>State bank group</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>State bank of India</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>21</td>
<td>State bank of Bikaber</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>22</td>
<td>State bank of Hyderabad</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>23</td>
<td>State bank of Indore</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>24</td>
<td>State bank of Mysore</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>25</td>
<td>State bank of Patiala</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
<tr>
<td>26</td>
<td>State bank of Travancore</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: - RBI, Recent trend and progress report, November 2010
4.1.3 Net banking or on-line Banking

The internet or the information highway has brought a revolution of a different kind in the world and banking is also exceptional. The internet has made banking very fast and name its new and changed ‘avatar’ as ‘online banking’ or the ‘Net Banking’.

In net banking the customer is not required to go to any bank counter. All he has to do is to open the bank’s website on his P.C. give the code of his account, make some transactions entries and press O.K. Everything remaining shall be done by the bank itself. This way a person can save time. Labour and money by completing hours work with in minutes.

In India, ICICI Bank, Global Trust Bank, HDFC Bank, IDBI Bank and some other banks have provided the facility of Net banking to their customers. Many government banks are also daring preparations for launching themselves in the field of net banking. SBI and Union Bank can be termed as a leader in this field.

In the last few years there has been a tremendous increase in net banking in the U.S.A. According to a study, expenses incurred in the U.S.A. for going to a bank and making a transaction is more than one Dollar, whereas in Net banking, this expenditure is reduced to 50th part of a Dollar. Future of Net banking is considered very bright in India too. In India ICICI was first to start net banking.

Net banking has helped to overseas the biggest obstacle of banking field that is geographical limitations. It is marvel of this facility that you can receive amounts from an account of yours across continents in any Indian city within few times. Online banking is also known as E-banking. Internet banking services are classified as under.
1) Account Information
   ➢ Provides the summary of bank accounts.
   ➢ Allows transaction tracking.
   ➢ Balance enquiry.
   ➢ Account statement.

2) Online Fund Transfer
   ➢ Transferring funds

3) Utility Bill payment
   ➢ Pay all types of bill like insurance, telephone and credit card bills.

4) Customers requirement
   ➢ Customer submits their own request online.
   ➢ ATM card facilities
   ➢ Demate accounting facilities.
   ➢ Demand draft.
   ➢ Cheque book
   ➢ Home loans.
   ➢ Car loans

4.1.4 Mobile banking

Mobile banking is an important step from the innovative banking point of view. M-banking is that banking in which a person can check about or transact from his account from anywhere in the world with the help of his mobile.

M-banking refers to the provision and availment of banking and financial services with the help of mobile tele-communication device. The scope of offered service may include facilities to conduct banking and stock market transactions to administer accounts and to access customized information.

For this technological change, process of changing internet portals into mortals has already been started. Various telecom companies, internet
service providers, cellular operators, E-commerce enablers, mobile phone manufacturers and net-working companies are busy in giving wireless form to its basic infrastructure. Leading banks like HDFC & ICICI have given wireless form to its basic infrastructure well ago.

- **Procedure of M-banking**

Here the customer sends a message to the bank using “short messaging service (SMS)” technology. Within 12 to 18 seconds of sending this message, answer is received on the screen of the call phone. This service is for both credit cards and bank accounts. It includes the services like balance inquiry, order for stop payment of a cheque and alteration in credit limit of an account.

**Picture:-4.4**

Mobile Banking services


In order to avail this facility, the customer has to type standard keywords in his cell phone like ICICI Bank ‘CCHQ’ for cheque book ‘BAL’ for balance. For example, if your bank is ICICI and you want to know the balance, you have to type ‘IBAL’. This way, this service helps the customers to know the details of their monetary position during journeys without coming to the bank.
Cellular phone operators are now moving towards the new age technology that is ‘wireless application protocol (WAP). It is an important step converting the information based service to transaction based service. WAP is the latest technology. It also enables banking transaction through mobile phone.

Table:-4.3
The Wireless Subscriber base in India
(30 September, 2012)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of operator</th>
<th>Number of Subscriber base</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bharti Airtel</td>
<td>185,922,489</td>
</tr>
<tr>
<td>2</td>
<td>Vodafone Essar</td>
<td>152,664,767</td>
</tr>
<tr>
<td>3</td>
<td>IDEA</td>
<td>115,464,737</td>
</tr>
<tr>
<td>4</td>
<td>BSNL</td>
<td>96,280,504</td>
</tr>
<tr>
<td>5</td>
<td>Aircel</td>
<td>66,607,361</td>
</tr>
<tr>
<td>6</td>
<td>Uninor</td>
<td>42,146,345</td>
</tr>
<tr>
<td>7</td>
<td>Videocon</td>
<td>4,451,203</td>
</tr>
<tr>
<td>8</td>
<td>MTNL</td>
<td>5,108,521</td>
</tr>
<tr>
<td>9</td>
<td>Loop Mobile</td>
<td>3,028,539</td>
</tr>
<tr>
<td></td>
<td>All India</td>
<td>671,674,466</td>
</tr>
</tbody>
</table>


Graph:-4.2
Wireless subscriber base in India
Here, point to be noted in that it is a record issue that India has 11 million new subscribers in January 2009.  

- There are 40 million landline subscribers in India.  
- Price for use $60 per phone and $6 per month for service consuming an average of 510 minute.  
- Mobile penetration is only 30% in India versus 80% in the USA and over 100% in Finland. Many users have two phone, one for work and second for family.  
- ICICI has also started an another interesting banking service by the name of billjunction.com. It claims that it is the first bill presentation and payment service of the country.  

**Indian Telephone subscriber base in India**

- Telephone subscriber base in India reaches 723.28 million.  
- A wireless subscription reaches 687.71 Million  
- Active wireless subscribers in VLR 482.89 Million  
- Wire line subscription declines to 35.57 Million  
- 17.10 Million new additions in wireless  
- Overall Tele-density reaches 60.99  
- Broadband subscription is 10.29 million  

The number of telephone subscribers in India increased to 723.28 Million at the end of September 2010 from 706.37 Million in August-2010, thereby registering a growth rate of 2.39 %. With this, the overall Tele-density in India reaches 60.99.  

**TRAI report for Mobile user in India**

- 671.67 million GSM users in September 2012  
- 100 million Indian who surf the web for more than 2 hours a day  
- 180 million Indians who are mobile users  
- 140 million Indians who are mobile data service users  
- 40 million Indians who are into mobile internet in a big way.
Above data indicate that mobile users are increasing in very fast. Airtel gets highest mobile subscriber i.e., 185.92 Million.

4.1.5 Tele banking

Tele banking means doing banking activities over the telephone handset, undertaking a host of banking related services including financial transaction from the convenience of customer chosen place anywhere across the globe and any time to date and night has now been made possible by introducing on-line Tele banking service.

By dialing the given Tele banking number through a landline or a mobile from anywhere, the customer can access his account and by following the user friendly menu, entire banking can be done through “Interactive Voice Response System” with sufficient numbers of hunting lines made available, customer call will hardly fail; see the picture no.4 for classification of tele-banking working procedure.

Diagram:- 4.2

Tele banking procedure

Source:-http://www.tricomtech.co.in/solutions/Tele%20Banking%20Solution.html
### Table: 4.4

**The Landlines Subscriber base In India**  
(End of February, 2012)

<table>
<thead>
<tr>
<th>Sr No.</th>
<th>Number of operator</th>
<th>Number of Subscriber</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BSNL</td>
<td>22,65,1180</td>
</tr>
<tr>
<td>2</td>
<td>MTNL</td>
<td>34,55,248</td>
</tr>
<tr>
<td>3</td>
<td>Bharati Airtel</td>
<td>32,59,938</td>
</tr>
<tr>
<td>4</td>
<td>Tata teleservices</td>
<td>14,23,544</td>
</tr>
<tr>
<td>5</td>
<td>Reliance Communication</td>
<td>12,69,694</td>
</tr>
<tr>
<td>6</td>
<td>HFCL Infotel</td>
<td>2,00,222</td>
</tr>
<tr>
<td>7</td>
<td>Sistema</td>
<td>48,070</td>
</tr>
<tr>
<td>8</td>
<td>Vodafone</td>
<td>17,580</td>
</tr>
</tbody>
</table>

**Source:** - TRAI, press released, New delhi, 7th April, 2012, p:17, www.trai.gov.in

### Graph: 4.3

**Landlines subscriber base in India**

![Graph showing landlines subscriber base in India](image)

The system is bi-lingual and has following facilities offered:

1. Automatic balance voice out for the default account.
2. Balance inquiry and transaction inquiry in all
3. Inquiry of all term deposit account
4. Statement of account by fax, e-mail or ordinary mail
5. Cheque book request
6. Stop payment which is on-line and instantaneous
7. Transfer of funds with CBS which is automatic and instantaneous
8. Utility Bill payments.
9. Provide term deposit renewable facilities through internet.

### 4.1.6 Credit Cards

Credit cards were introduced in America in 1950, when a businessman Frank Menomara invited some of his friends for dinner in a hotel. Suddenly at the time of payment, he discovered that he forgets to bring the purse. He phoned his wife to send the cash and decided to develop a foolproof system to avoid such position in future. This way credit card came into existence in 1950 and it was introduced in India in 1966 as a branch of ‘Dinar club’. In August 1980, credit card facility was provided by the central bank by establishing relations with internationally acclaimed, master card as the first bank.

Credit card is that small piece of plastic which gives the holder a facility of travel, entertainment, cash, hotel facility, purchases from departmental stores, shops, home purchase, orders ticket to train and air travel etc. on credit basis. In the whole world various types of credit card are used for transactions. Here the researcher has appemted to give list of all time favorite Credit card in picture 4.5.
The two most popular credit cards of the world master card & the VISA entered the world market in 1966. These are accepted in 180 countries of the world. In India credit cards were first submitted by ‘Dinar club of India ltd’. The card holder becomes a member by depositing a particular one time fees and gets a facility of paying for good and services in a period of 45 days. Many banks are issuing credit cards. Apart from these APEX, vip club, international, intercard etc. discount cards are also issued.

Various banks issue VIP, vvip cards, Leela Hotel Cards, Rahiya card etc. State Bank provided some cheques also along with the cards which are discounted hand-to-hand, because it holds the guarantee of the bank for the payment of that cheque or amount. Therefore, these are called special

Source:- http://www.iconshock.com/credit-card-icons
cheques. These cheques can be discounted from any branch of the State Bank.

**Prospects of credit cards**

These are good chance of increasing this business in India. Number of card-holders in India is negligible. But the rate at which the credit card culture is spreading in the country. It is expected that these cards will become very popular in the middle and upper middle class.

**Merit of credit cards**

- The card holder gets the freedom from the risk of carry cash.
- Every card also carries an insurance facility.
- It also carries the facility of getting tickets from the ticket window for the railways.
- It has also became status symbol.
- It can avail the facility which provides luxury hotel, restaurants, air and sponsored tours etc.
- Large number of entrepreneur is ensured about the payments for the sales made through the credit cards.

**Demerits of credit cards**

- Credit card is also another form of advance so if the customer does not pay back, then bank faces problems in recovery.
- If the card holders spend beyond limits, a problem of recovery arises.
- Banks have to fee huge losses due to increase of overdraft and recovery problem of the credit cards.

**4.1.7 Smart card**

The automated chip card was invented by German rocket scientist Helmut Gro’ttrap in 1968. A smart card usually contains an embedded 8 bit micro-processor a kind of computer chip. The micro-processor is under
a contact pad on one side of the card. Think of the micro-processor as replacing the usual magnetic stripe present on a credit card or debit card.

Smart card is much more popular in Europe and U.S countries. The health insurance and banking industries use smart cards extensively. Every German citizen has a smart card for health insurance.

Picture:-4.6

Structure of Smart card

Source:-http://www.tiresias.org/about/publications/accessibility_visitors/chapter3.htm

- Characterized of Smart cards

A smart card is characterized as follows.

a. Dimensions are normally credit card size. The ID-1 of ISO/IEC 7810 standard defines them as 85.60 X 53.98 mm. Another popular size is ID-000 which is 25x15 mm, commonly used in sim cards. Both are 0.76 mm thick.

b. Contains a security system with tamper resistant properties (e.g a secure crypto processor; secure file system, human readable features) and is capable of providing security services.

c. Asset managed by way of a central administration system which interchanges information and configuration setting with the card
through the security system. The latter includes card hosting updates for application data.

d. Card data is transferred to the central administration system through card reading devices, such as ticket reader, ATMs etc.

- **Benefits**

  a. Smart card can be used for identification, authentication and data storage.

  b. Smart cards provide a means of effecting business transaction in flexible secure, standard way with minimum human intervention.

  c. Smart card can provide strong authentication single sign on or enterprise single sign on to computers, laptops data with encryption, enterprises resource planning platforms such as SAP.

<table>
<thead>
<tr>
<th>Table: 4.5</th>
</tr>
</thead>
</table>

**Smart card Communication Protocols**

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>T=0</td>
<td>Character level transmission protocol defined in ISO/IEC 7816-3</td>
</tr>
<tr>
<td>2.</td>
<td>T=1</td>
<td>Block level transmission protocol defined in ISO/IEC 7816-3</td>
</tr>
<tr>
<td>3.</td>
<td>ISO/IEC 14443</td>
<td>APDU transmission via contra less interface defined in ISO/IEC 14443-4</td>
</tr>
</tbody>
</table>

Source: - Mike Hendry, multi application Smart cards techniques, Cambridge University press, lec-7.

The technically hurdles made smart cards functionally and securitally more difficult. To address this problem, the ERIDANE project was launched by ‘The Berlin Group’ to develop a proposal for a new functional and security framework for smart card based point of interaction (POI) equipment. Used smart equipment that would be used for instance in retail environments.9
4.1.8 Electronic fund transfer (EFT)

In India, the fund transfer are basically done through mail transfer, draft or telegraphic transfer. In case of telegraphic transfer, again the department of telecommunication was the sole provider of telephone, telex and telegram facilities. With the process of liberalization, private operators have started providing alternative voice communication channels through mobile phones and vax communication as an alternative channels for data communication. It was normal for any telegraphic transfer to be credited to the beneficiary’s account after delay of 2 to 4 days. The different forms of Electronic fund transfer prevalent in the use are as under.

1. EFT through Electronic Data interchange.
2. Bank net.
3. RBINET
4. IDRBI VSAT Network
5. EFT from points of sales
6. Electronic cash
7. Swift global system for funds transfer
8. Electronic clearing settlement

<table>
<thead>
<tr>
<th>Year</th>
<th>EFT Transaction volume (Rs. thousand)</th>
<th>EFT transaction value (Rs. Crore)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004-05</td>
<td>2549</td>
<td>54601</td>
</tr>
<tr>
<td>2005-06</td>
<td>3067</td>
<td>61288</td>
</tr>
<tr>
<td>2006-07</td>
<td>4776</td>
<td>77446</td>
</tr>
<tr>
<td>2007-08</td>
<td>13315</td>
<td>140326</td>
</tr>
<tr>
<td>2008-09</td>
<td>32161</td>
<td>251956</td>
</tr>
</tbody>
</table>

Source:-RBI, Report on trend and progress of Banking in India 2008-09
4.1.9 Electronic bill payment (EBP)

EBP attracts customers due to the faster and efficient bill payment services. Electronic bill payment such a services that allow to customers received and pay bills through telephone and online computer network. Most of Indian banks are trying to adopted EBP portal. ICICI has already started a portal called Billjunction.com. Banks are trying up with utilities like MTNL, Airtel, Orange and BPL Mobile, Vodafone etc. Mobile company allows to customers pay bills.

At present level of technology, a customer, who receives a bill in physical from lays into the network in order to makes an on-line payment. In future scenario, bill would be sent to customers using an e-mail ID of the customers.

4.1.10 Electronic Data Interchange (EDI)

Electronic data interchange is a computer to computer transfer of details of commercial or administrative transactions using an agreed protocol and standard data structure. EDI is the exchange of documents of
value in standardized electronic form between organizations in an automated manner directly from a computer application in one organization to an application in another. EDI is part of electronic commerce. EDI is most often used between different companies and uses some variation of the ANSI X12 standard (USA) or EDIFACT unsponsored global standard EDI standard have been developed in respect of specific messages for transmission of business, which are electronic equivalents of commercial in voices. Purchase orders, transport booking and payment in structure.¹¹

<table>
<thead>
<tr>
<th>Year</th>
<th>Volume of Transaction (000's)</th>
<th>Value of transaction (Crore)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ECS Credit</td>
<td>ECS Debit</td>
</tr>
<tr>
<td>2006-07</td>
<td>69019</td>
<td>75202</td>
</tr>
<tr>
<td>2007-08</td>
<td>78365</td>
<td>127120</td>
</tr>
<tr>
<td>2008-09</td>
<td>88394</td>
<td>160055</td>
</tr>
<tr>
<td>Total</td>
<td>235778</td>
<td>362377</td>
</tr>
</tbody>
</table>

Source: Report on trend and progress of Banking In India 2008-09

Graph: - 4.5

Electronic transaction of ECS credit and debit

![Graph of Electronic transaction of ECS credit and debit](image)
The above table no. 4.7 on the page no 4.5 exhibits data of Electronic transaction of ECS credit and debit. It shows that the ECS credit and debit, which stood at 69019 and 75202 respectively in 2006-07. ECS credit volume increased by 78.08% from 2006-07 to 2008-09. ECS debit increased by 46.98% from 2006-07 to 2008-09. Volume of transaction of credit were increased by 83273 to 782222 from 2006-07 to 2007-08 and next year ECS credit transaction decreased because of recession period by 97487 from 2008-09. ECS debit increased by 25441 to 66976 from 2006-07 to 2008-09. ECS debit volume increased by 37.98%.

4.1.11 E-cheque

An E-cheque is the electric version of representation of paper cheque. The information and legal framework on the E-cheque is the same as that of the paper cheques. It can now be used in place of paper cheque to do any and all remote transactions. An E-cheque works the same way a cheque does, the cheque writer “writes” the e-cheque using one of many types of electronic devices and “gives” the e-cheque to the payee electronically. The payee ‘deposits’ the electronic cheque when he received credit and the payee’s bank “clears” the e-cheque to the paying bank. The paying bank validates the e-cheque and then “charges” the check writers account for the check.  

4.1.12 E-Zwich

E-Zwich is electronic platforms that enables loading and spending of e-cash and also allows the settlement of inter bank claims in addition to on-line transactions. Customers are able to effect transaction “offline” in under developed area where power and communication infrastructure may be lacking. All transactions occur between a customer card and another card in a POS (Point Of Scale) or ATM.
**Benefits of E-Zwich**

- It is easy to use
- It is safe and secure
- It is convenient and accessible

Banking facilities will be extended to people who have presently limited or no access to banking services under banked and unbanked customer. The current banking systems will experience major improvement with the introduction of a wide range of affordable and secure new banking products and services.

The current banking systems will experience major improvement with the introduction of a wide range of affordable and secure new banking product and services. The general public will benefit from a more convenient, safer and easier way to spend and receive money by using the smart card.\(^{13}\)

**4.1.13 MICR clearing**

MICR means magnetic ink character reader or recognition. MICR is a character recognition technology adopted mainly to facilitate the processing of cheque in the banks. The process was demonstrated to the American Bankers Associations in July, 1956 and it was almost universally employed by 1963. MICR characters are printed with a magnetic ink or toner. Magnetic printing is issued so that the characters can be reliably read into a system.\(^{14}\)
Table: 4.8
MICR Cheque Clearing Centers and Non-MICR Clearing Centers
(Number in million and amount in billions)

<table>
<thead>
<tr>
<th>Year</th>
<th>MICR Centers</th>
<th>Non-MICR Centers</th>
<th>RBI Centers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>Amount</td>
<td>No.</td>
</tr>
<tr>
<td>2004-05</td>
<td>941.6</td>
<td>93562.52</td>
<td>225.39</td>
</tr>
<tr>
<td>2005-06</td>
<td>1031.84</td>
<td>94743.71</td>
<td>254.92</td>
</tr>
<tr>
<td>2006-07</td>
<td>1144.10</td>
<td>104354.36</td>
<td>223.18</td>
</tr>
<tr>
<td>2007-08</td>
<td>1222.96</td>
<td>115286.90</td>
<td>237.60</td>
</tr>
<tr>
<td>2008-09</td>
<td>1163.82</td>
<td>104082.42</td>
<td>233.57</td>
</tr>
<tr>
<td>2009-10</td>
<td>1149.71</td>
<td>85315.17</td>
<td>230.57</td>
</tr>
</tbody>
</table>

Source: Report on trend and progress of Banking in India 2009-10

Graph: 4.6
MICR Cheque Clearing Centers and Non-MICR Clearing Centers

In India, MICR was introduced in 1987 in four metro cities. MICR is now available at 14 centers and is proposed to be expanded to a total 22 centers where volume of clearing transactions is large.
4.1.14 RTGS (Real time gross system)

Real time gross settlement are found transfer system where transfer of money takes place from one bank to another on a “real time” and on “gross” basis. Settlement in ‘real time’ means payment transaction is not subject to any waiting period.

Diagram: - 4.3

System architecture of RTGS


The transactions are settled as soon as they are processed. “Gross settlement” means the transaction is settled on one to one basis without bunching or netting with any other transaction, once processed of payments are final and irrevocable.
### Table: 4.9

**RTGS Volume and Value**

<table>
<thead>
<tr>
<th>Bank Types</th>
<th>RTGS (Real time gross system)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RTGS Volume (Percentage)</td>
<td>RTGS Value (Percentage)</td>
<td></td>
</tr>
<tr>
<td>Public Sector Bank</td>
<td>24903.89 (49.21)</td>
<td>36903.04 (32.11)</td>
<td></td>
</tr>
<tr>
<td>Private Sector Bank</td>
<td>19740.95 (39)</td>
<td>45212.71 (39.33)</td>
<td></td>
</tr>
<tr>
<td>Foreign Bank</td>
<td>5259.72 (10.39)</td>
<td>25891.8 (22.53)</td>
<td></td>
</tr>
<tr>
<td>Central Bank</td>
<td>522.7 (1.03)</td>
<td>1307.63 (1.14)</td>
<td></td>
</tr>
<tr>
<td>Non-banking Financial Institute</td>
<td>185.26 (.37)</td>
<td>5628.21 (4.9)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Report on trend and progress of banking in India, Reserve Bank of India, Mumbai

### Graph: 4.7

**RTGS Volume and Value**

Above table shows information of Real time gross system. Public sector bank in India receives highest RTGS volume i.e. 49.21% and value 32.11%. Private sector banks value is greater than public sector bank but his volume is less than public sector bank. Foreign bank stands with 10.39% of RTGS volume and his value 22.53%. Central bank and NBFC have received 1.03 and .37 % volume respectively.
4.1.15 STEPS (State bank payment system)

STEPS is a high innovative and effective payment solution, designed, developed and implemented by the bank. By this, the customer from anywhere can transfer his money in his account and within next day, it is deposited in the branches covered by this method. As on 31-03-05, a total numbers of 4042 FCB’s were brought under STEPS.

4.1.16 Shared payment Network system

The shared payment Network system, named SWADHAN has been sponsored by the Indian banks’ Association (IBA). It is a network of ATMs, points of scale terminals and cash dispensers with a view to pool the resources of the banks and underlines the spirit of competition through co-operation. It became operational in Mumbai on 1st February 1997 and in two years letter. About 150 ATMs were owned and installed by 38 banks including foreign banks, public and private sector. Indian commercial banks and co-operative banks. The biggest advantage of the network is that the ATM cards issued by different banks can be used at any member banks ATM.

Banks can have as many ATM as they want and follow some standards set by the SPNS committee. The heart of the network is the switch and its main components are Tandem mainframe computer, BASE 24 software, Motorola networking equipments and the leased lines.\(^{15}\)

4.1.17 Electronic Authentication and Signature

The banks are now using technology for the proper identification of customer’s identity. Today is a modern era, so bank has accepted technology and internet communication, It has become essential to verify the identities of the customers. An E-banking service improves the efficiency of the banks. Hence, they have adopted alternative authentication methods. Electronic signature, through a new feature, has
gained much popularly among the customers of every bank. It helps to identify a person who signs. It is the best option within the banking platform.

4.1.18 SWIFT (Society for worldwide inter bank financial telecommunication)

SWIFT means Society for worldwide inter bank financial telecommunication. SWIFT operates a worldwide financial messaging network, which exchanges messages between banks and other financial institutes. Swift also markets software and services to financial institutions much of it for use on the SWIFTNET Network and ISO 9362 bank identifier codes (BICs) are popularly known as “SWIFT CODES”

Diagram:-4.4
SWIFT Codes work


The majority of international inter bank messages use the SWIFT Network 2008, SWIFT linked 8740 financial institution in 209 countries. All Indian public sector banks are part of the international financial
messages communication network. SWIFT provides reliable and expeditious telecommunication facilities for exchange of financial messages all over the world. The gateway is in Mumbai and efforts are on to other cities through leased lines public data network.\textsuperscript{16}

4.1.19 **ACH (Automated clearing house)**

ACH (Automated clearing house) is an electronic banking network operating system. An electronic funds transfer system run by the national automated clearing house association. This payment systems deals with payroll, direct deposit, tax refunds, consumer bills, tax payment and many more payment services rules and regulations, governing the ACH network have been issued by the Reserve bank of India by the help of the State bank of India.

4.1.20 **SSC And FEC**

(\textit{Settlement securities system & Foreign exchange clearing})

Securities settlement system (SSC) and foreign exchange clearing (FEC) system are their critical components of the payment and settlement system. The clearing corporation of India (CCIL), set up by banks acts as the central counter party for clearing of transactions. The CCIL operates the clearing while funds and security take place in the Reserve bank.

4.1.21 **DigiCash (Digital cash)**

David Chaum, a mathematician and privacy expert, founded DigiCash in 1994. This provider creates e-cash, proprietary electronic cash tokens, which are marketed as being the equivalent of cash. An account is established at a DigiCash-licensed bank with real money. Once established, the customer can withdraw e-cash that is stored on the user computer's hard drive. Using proprietary software, e-cash can be spent with an Internet merchant or with anyone else, whose computer is set up to deal
in e-cash. Using public-key cryptography, the digital tokens are said to be secured and can be registered and verified by the issuer without revealing to whom it was originally issued. In effect, these digital cash transactions are capable of being as anonymous as cash. No transaction confirmations are necessary, meaning the merchant can immediately ship the product.\textsuperscript{17}

4.1.22 Net Cash

This concept is similar to e-cash, except that it does not require any special software to use. Net Cash is transmitted across the Internet using an encryption scheme known as PGP (pretty good privacy). To get NetCash, a party must send a check or money order to the company's headquarters. The company returns electronic coupons via e-mail.

4.1.23 Millicent

The Millicent method is developed by Digital Equipment Corporation (DEC) Corporation in 1995 to manage small and smallest payments (e.g. payment for getting information from the Internet about news and stock quotations or payment for small programs like Java-applets).

The customer buys broker scrip with a defined value by using his credit card or by debiting a suitable bank or broker account. Such scrip is like a telephone card. At the time of purchase, the customer exchanges parts of the scrip into a dealer's scrip. This scrip is then send to the dealer. The dealer collects all scripts and exchanges them into "real" money.\textsuperscript{18}

4.1.24 Mondex

Mondex is owned by Master Card and National Westminster Bank of London and is being tested in several countries. Mondex uses a smart card to store electronic cash that can be used to pay for goods and services in the same way as cash but with some key benefits over traditional cash.\textsuperscript{19}
4.2 Conclusion

It is marked that Indian banking sector is moving towards sustainable changes like innovative services, operational transaction and offering various technology based services to the customers. The trend is evident in of public sector and private sector banks. It is noticed that both banks have focus on innovative services as a part of their future banking strategy. Bank derives new business technology model for satisfying customers. The bank has created sustain environment that carried out profitability, creativity, liquidity and diversity. The innovations are adopted by banking sector as a part of technological changes and future requirement. ICICI bank and HDFC bank found to be more aggressive in technology up gradation and it is positioned ahead in term of services offered by the bank.
Reference


6. Telecom regulatory authority of India, New Delhi, press release no. 86/2012, 3rd May, 2012, reports available on www.trai.gov.in


17. S. Shiva Ramu, Cyberspace & Repositioning of Corporations, University press (India) limited, Hyderabad, 1999, p.5.